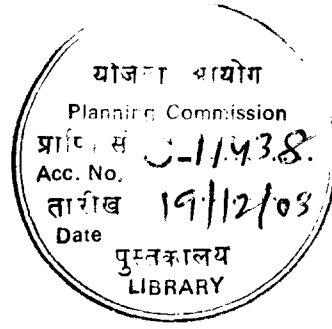


PUNJAB DEVELOPMENT REPORT



PLANNING COMMISSION
GOVERNMENT OF INDIA



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PREPARATION OF STATE DEVELOPMENT REPORT ON PUNJAB

The State Development Report (SDR) on Punjab focuses on the present, future and the past. It has been prepared by members of the faculty of the Centre for Research in Rural and Industrial Development (CRRID). They were individually assigned the chapters based on their experience and expertise. The SDR has gone through a process of evaluation in this period of eleven months. It has also drawn a great deal on the experiences and analyses of the studies carried out by the Centre in the past two decades, covering practically every issue relevant to the SDR.

The process of preparing the SDR began with the first meeting chaired by Dr. K Venkatasubramanian, Member, Planning Commission and Chairman of the SDR, who was ably assisted by Shri P K Mohanty, Principal Adviser and other officers of the Planning Commission. CRRID was represented by the Director and Shri J P Gupta, another colleague, at this meeting which sought to evolve the framework, approach and methodology to be adopted by the team selected for carrying out this assignment. The discussion led to the decision to hold a meeting at Chandigarh with senior officials from the state government and experts from different parts of the country. Both the Member and Principal Adviser, Planning Commission, visited the Centre to participate in the proposed meeting. It was in the form of a brainstorming session led by the Member and the Principal Adviser. The Chief Secretary and all the Secretaries and heads of the departments concerned with the report represented the state government. A few experts, identified by CRRID as advisers, were also invited to participate, together with the members of the team engaged in preparing the report. The brainstorming session helped streamline the framework, approach and methodology of the study and identified the priority areas of development. Shortly after this, an interactive session was held with the Chief Minister, Punjab, who had just taken over, together with his officers. This meeting was organized to have the benefit of the information, advice and priorities identified by the new party government. It was followed by another one to streamline as well as clarify the old and newly identified issues concerning the pattern of development as prioritized and visualized by the state government.

There are many notable features of the SDR. First, is the participation of the beneficiaries, stakeholders, benefactors and even critics, from different political persuasions and disciplines over a period of time.

The second most important feature is the input received from experts and officials of Punjab Government, the Planning Commission of India and several autonomous research institutions. This exercise enabled the team to prepare the first draft of the report. It was circulated to the state government and the Planning Commission for their suggestions and comments. The response on this account, including appreciation of some chapters, that the team received were both instructive and suggestive. Subsequently, two meetings, each lasting more than three hours, were arranged with the Chief Minister, Punjab and Dr. Manmohan Singh, former Union Finance Minister, who is also the Chairman of the Governing Body of CRRID. The Chief Minister, accompanied by eleven senior officers of the state government, acknowledged the relevance as well as importance of the report and also the approach, which, he remarked, the state government was going to adopt.

Dr. Manmohan Singh, who had some apprehensions at the beginning, observed that the team had done commendable work. He also made a few suggestions, which were incorporated.

The first draft, after incorporation of the suggestions and comments, was placed for discussion at a meeting between members of the team and experts who had been associated with the preparation of the report. These included, Shri Anand Sarup, former Education Secretary to the Government of India and author of National Education Policy, 1986; Professor S K Ray, former Professor, Institute of Economic Growth, who has also been Visiting Professor to CRRID; Smt Adarsh Mishra, the then Principal Secretary, Health and Family Welfare, Delhi Administration; Professor S S Johl, well-known agricultural economist; Shri T K A Nair, Chairman, Public Enterprises Selection Board; Professor Rajesh Kochar, Director, National Institute of Science, Technology and Development Studies (NISTAD); Professor Sucha Singh Gill, well-known economist from Punjabi University, Patiala; Dr. Gangadhar Jha, Director, National Institute of Urban Affairs; Professor S K Goyal, former Chairman, Research Advisory Committee of the Prime Minister/Planning Commission and currently Director, Institute of Studies in Industrial Development; Shri K R Lakhanpal, Principal Secretary, Finance, Government of Punjab; Dr. S K Tuteja, the then Development Commissioner, Small Scale Industries and Additional Secretary to the Government of India, who was further assisted by the technical staff from Small Scale Industries, Ludhiana, comprising, Shri Bharat Bhushan, Deputy Director, Small Industries Service Institute, Government of India and Shri Viney Malhotra, Small Industries Promotion Officer, Small Industries Service Institute, Government of India. At the technical level the team received suggestions from Shri M L Nikhasi, former Editor, *Manpower Journal*.

It may be appropriate to record here that the magnitude of the task involved in preparing the SDR was not perceived at the time of bidding for the assignment. The initial time-schedule of six months had to be extended by another two and half to three months. It has in effect taken eleven months. In other words, it would be advisable to suggest that such efforts should be given a minimum of one year's time to ensure that it serves the purpose of a referral document for many years to planners, scholars and administrators. It can be safely said that the report being presented to the Planning Commission has been prepared with this objective in mind.

A notable feature of the report is something that usually passes unnoticed. This is the quality of its presentation through careful editing. This was in the able hands of Shri Subrata Banerjee, a well-known journalist, veteran editor, political commentator and diplomat, who has been associated with CRRID for the past two decades. He succeeded Shri P N Haksar, as Editor of *Man and Development*, the international quarterly journal published by CRRID since 1979. He is at present the adviser of CRRID's research and publications programme.

The other distinctive feature of the report is the contribution of the collective sensitization of the researchers working at CRRID for many years, to changing realities. The environment of cross-fertilization of ideas, free and frank exchange of views, information and analysis between and among the members of the team, during this one year, have helped to give the report an integrated character highlighting the basic issues of the development of the state.

Thanks to the Planning Commission, for funding, working on this report has helped CRRID in widening the scope of inter-disciplinary and multi-disciplinary research, which has been one of its basic objectives. Another advantage of participation in this project is that the contributors are now in a position to utilize their vast knowledge, perceptions, and comprehension gained, for publishing monographs on their respective areas of work for wider dissemination.

The team had also the rare benefit of listening to the experiences of Shri I K Gujral, former Prime Minister of India and Shri Jagmohan, Union Minister for Tourism and Culture on the issue of 'Governance'. Shri K C Pant, Deputy Chairman, Planning Commission has emphasized the importance of this subject in his 'Foreword' to the National Human Development Report published by the Planning Commission for the year 2001.

The discussions that followed, in which a number of eminent scholars participated, have a bearing on some of the major issues of the report. This is also true, of the week-long programme of lectures, discussions and seminar held recently in memory of the late Shri P N Haksar. It covered practically every single issue discussed in this report, particularly the question of 'Fiscal and Financial Management'.

After receipt of comments and advice on, and even appreciation of, the first draft submitted by CRRID to the Planning Commission and different departments of the state government, we arranged to have the report released in the presence of the Hon'ble Chief Minister, Punjab by the Chairman of the State Development Report (SDR) Dr. K. Venkatasubramanian, Member Planning Commission, on 27 September 2002 at Chandigarh. For some unavoidable reasons, the Chief Minister suggested a change in the date of release. Shri P.K. Mohanty, Principal Advisor, Planning Commission, who had already reached Chandigarh to participate in the release, according to the earlier scheduled date, took this opportunity to spend considerable time to interact with the members of the faculty engaged in preparing the report. At the end of the session, he suggested that a presentation be made before the Hon'ble Deputy Chairman and other members and officials of the Planning Commission. Shri Mohanty pointed out that the Deputy Chairman, Planning Commission always made perceptive comments, based on his wide experience, at such meetings. This report would thus have the benefit of his wisdom. I immediately agreed to his very valuable suggestion. He said he would confirm the proposed arrangements and date of presentation.

In the meantime the members of the team had the opportunity to spend several hours with Professor S.R. Hashim, former Member-Secretary, Planning Commission and Shri G.K. Arora, Former Member of the Civil Services and Director, IMF, both members of the Governing Body of CRRID. This proved to be a very rewarding interaction and an additional input to the finalization of the draft report.

After the formal release of the Report at Chandigarh, we propose to have it discussed at the state, national and international levels, in view of its importance as well as relevance for the international funding agencies, groups of NRIs, corporate sector and other stakeholders at home and abroad. Simultaneously, each chapter is going to be updated and developed for publication as a monograph or a book. This will help wider dissemination of this nationally important report, the result of a creative, innovative and educative experience that the Planning Commission has initiated. It brings into focus a creative and productive interaction among and between the states in the region for the

solution of commonly shared problems of socio-cultural and economic development, on the basis of comparative advantage. This makes development a positive component of national integration.

The multidisciplinary research at the grassroots level, combined with certain experiments in social activism in related areas on a wide range of developmental issues that CRRID has been conducting in the states of this region, could sustain such an approach to development. It could enable planners, policy makers and administrators to resolve some of the issues which have assumed political and conflictual overtones because of failure to provide the input of professional expertise as a part of the developmental process. It is an unfortunate reality that once an issue of socio-cultural and economic development becomes politicized the role of social scientists, intelligentsia and other professionals become irrelevant. It is in this context that the planning process must be strengthened through a continuing and creative interaction with ongoing multidisciplinary research as a part of overall development of the states, in the interest of the nation.

This is one of the missions on CRRID's agenda which we hope to carry out with the support of the Planning Commission and other nationally important institutions, agencies and the Indian Council of Social Science Research (ICSSR), Ministry of Human Resource Development, in particular, in the years to come.

It is hoped that the report will serve as a contribution of valuable inputs to policy making by scholars and experts from outside the government. We also hope that the SDR on Punjab will serve the long-felt need for a comprehensive data-based analytical overview of development problems of the state for policy makers, administrators, researchers and the corporate sector, besides international funding agencies.

This major project of CRRID could not have been successfully completed without the enthusiastic involvement of the administrative, computer, library and other supporting staff at different levels and at all times. This of course is a characteristic feature of the work culture of CRRID, but bears special mention.

POSTSCRIPT

This *post script* has been added to this chapter in acknowledgement of the valuable input received at the meeting presided over by Hon'ble Dr. K.C. Pant, Deputy Chairman, Planning Commission, on October 23, 2002. The meeting was fixed by the Planning Commission of India for presentation of the State Development Report (SDR) and its release by the Deputy Chairman. The interaction with some of the members and senior officials of the Planning Commission, who participated at the meeting, was a most rewarding experience for all the members of the faculty and also the advisors who had contributed to the preparation of the SDR.

The Deputy Chairman spent considerable time, in fact, more time than was originally scheduled. The intervention by him was stimulating for everyone present at the meeting. It also helped identify the specific task for the Centre for Research in Rural and Industrial Development (CRRID), as a follow up of this report, of holding seminars on the issue of interconnectiveness and interdependence of the states within the region for identifying and implementing the developmental programmes/projects of common interest and their

benefit to the states. He underlined the importance of formulating projects based on the recommendations of the SDR in agriculture, industry, information technology and infrastructural development.

The Deputy Chairman placed on record the Planning Commission's appreciation of the SDR. He was supported by the Chairman of the Core Committee, Hon'ble Dr. K. Venkatasubramanian, Member, Planning Commission, who had monitored the preparation of the report right from the beginning. The report was subsequently presented to the Hon'ble Chief Minister, Capt. Amarinder Singh, at a well-represented meeting organized by the CRRID on 2 December, 2002. The Chief Minister who had earlier spent considerable time during his interactive sessions with the members of the faculty, made the following observations:

It is my immense pleasure to acknowledge with great appreciation, the initiative taken by the Planning Commission in involving autonomous research institutions, universities, and non-government organizations in the task of preparing the State Development Reports. This style ensures objectivity in understanding of the evolving scene; it also allows the engagement of experts in the service of the State. Such reports tend to have a wider perspective and invariably stress on interconnectivity of States in realization of development goals, and thereby strengthen the cause of nation building. A time has come when neighbouring States have to co-operate rather than compete for utilization of scarce natural resources. Only such a strategy can harmonize efficiency with equity.

The Chief Minister also placed on record his appreciation of the efforts made by the members of the faculty of CRRID in preparing such a comprehensive document.

The CRRID has set for itself the task of implementing the agenda, that emerged during the interaction with the Planning Commission, by holding discussions, seminars at the regional, national and even international levels to highlight the relevance as well as importance of the paradigm introduced by the Planning Commission under the guidance of the Deputy Chairman. Surely this will strengthen the long-felt need of initiating the process of co-operative development on the one hand and reinforce the nationally held philosophy of *unity in diversity* on the other.

The present initiative by the Planning Commission provides an opening to widen as well as strengthen the scope of multidisciplinary research in social science. As an Institute of National Status, CRRID has been committed to such a programme of multidisciplinary research on issues of multidimensional importance, since its very foundation.

Chandigarh

Rashpal Malhotra
Founder Director

कृष्ण चन्द्र पन्त
K. C. PANT



उपाध्यक्ष
योजना आयोग
भारत
DEPUTY CHAIRMAN
PLANNING COMMISSION
INDIA

December 28, 2002

FOREWORD

In order to address the development concerns of State Governments through an independent and analytical framework, Planning Commission decided to have State Development Reports prepared which would serve as credible documents to help set the agenda for the economic growth of States.

The preparation of State Development Reports is a recent initiative taken by the Planning Commission to foster a sense of partnership between the Centre and the States to jointly assess the development alternatives available keeping in view the financial, human and material resources and the felt needs of the people. This exercise has also underlined the need to take a re-look at governance issues and policy options which will enable the States to provide a better quality of life to their people.

I hope that the Punjab State Development Report which has highlighted critical issues for the State will not only stimulate debate regarding the road map for the State but will also help the State Government take a close look at the problems which have hindered the realization of optimum growth and socio-economic development in the State. The Report rightly underlines the urgent need for restoration of State's growth rate above or at least at par with the national average.

I look forward to Punjab, with its vigour and enterprise, attaining the high level of prosperity and human welfare which will follow in the wake of its realizing its true potential.


(K.C. PANT)

Dr. K. Venkatasubramanian
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28th December, 2002

INTRODUCTION

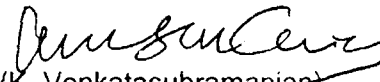
Planning Commission has launched innovative schemes to improve effectively the Governance of the Plans as per the directions of Hon'ble Shri. K.C. Pant, the Deputy Chairman of the Planning Commission. One such initiative is to draw up State Development Reports, which will lay the road for real development in the States.

In implementation of the Central Plan Scheme of "50th Year Initiative for Planning", the Planning Commission has been preparing the State Development Report (SDR) for the States. The salient aim of this Scheme is to compile quality reference documents on development profile and strategy for accelerating the pace of development of the respective States. These SDRs are to act as major inputs in steering the growth process of the respective States.

In preparing the Punjab State Development Report, the expertise of the Centre for Research in Rural and Industrial Development (CRRID), Chandigarh was availed of on payment basis. A Core Committee under my chairmanship reviewed various dimensions of current developmental issues in Punjab and decided the scope and coverage of the SDR for the State with active involvement of the Government of Punjab and the selected agency (i.e. the CRRID, Chandigarh). Expert advice of all the Members of the Core Committee is well appreciated.

This exercise is particularly relevant in case of Punjab under the circumstances that during the period from 1993-94 to 1999-2000, Punjab with its satisfactory level of infrastructure support could achieve an annual growth rate of 4.65% against the all India rate of 6.68%. The inputs on developmental problems in the State and corrective policy measures suggested in the Report would be extremely useful in directing the growth process of the State at this juncture when the 10th Five Year Plan has just started.

I would like to thank also Shri. Rashpai Malhotra, Founder Director, CRRID and his team of experts for carefully preparing the State Development Report for Punjab on behalf of the Planning Commission.


(K. Venkatasubramanian)



ਮੁੱਖ ਮੰਤਰੀ, ਪੰਜਾਬ
Chief Minister, Punjab
ਚੰਡੀਗੜ੍ਹ
Chandigarh

MESSAGE

The State Development Report of Punjab, prepared by the Centre for Research in Rural and Industrial Development, Chandigarh (CRRID), at the behest of the Planning Commission, New Delhi, could not have appeared at a more critical moment than the present one. Punjab today requires a correction of its fiscal imbalance, rejuvenation of the socio-economic dynamism, and upgradation of the human resource base. It is faced with the questions of diversification of its agricultural economy by replacing the wheat-rice rotation by an ecologically viable pattern, and above all, of meeting the challenges posed by globalization. The Report comprehensively and in depth grapples with these issues in a purposeful manner

Soon after taking over the reigns of government, I along with my colleagues and senior officials of the State Government held two interactive sessions with the officials of the Planning Commission, experts and members of the team of the CRRID engaged in carrying out this task assigned to them by the Planning Commission of India. These interactive sessions and my subsequent discussions with the members of the faculty of the CRRID were most educative and rewarding.

It is my immense pleasure to acknowledge with great appreciation, the initiative taken by the Planning Commission in involving autonomous research institutions, universities, and non-government organizations in the task of preparing the State Development Reports. This style ensures objectivity in understanding of the evolving scene; it also allows the engagement of experts in the service of the State. Such reports tend to have a wider perspective and



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-2-

invariably stress on interconnectivity of States in realization of development goals, and thereby strengthen the cause of nation building. A time has come when neighbouring States have to cooperate rather than compete for utilization of scarce natural resources. Only such a strategy can harmonize efficiency with equity.

The present exercise achieves this objective admirably. I congratulate the CRRID for carrying out this mission with exemplary zeal. Encouraged by this experience, we are moving on to the next phase of getting prepared 'district development reports', in the spirit of devolving powers to the village panchayats and urban local bodies under the 73rd and 74th Constitutional Amendments, as I believe, that development has to be, not only for the people but also by the people.



(Amarinder Singh)

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Executive Summary

Profile of Development and Change

Punjab is a classic example of a fast developing economy with agriculture at its base. It enjoys the credit of ushering the green revolution in the country. A progressive mix of irrigation, fertilizers and high-yielding variety seeds laid its foundation; a process, which was further strengthened by agricultural credit societies, rural link roads, village electrification, and a variety of extension services. Punjab today contributes nearly 40 per cent of wheat and 60 per cent of rice procured for distribution through the public distribution system. Along with this, the state went in for promoting the white revolution, resulting in the highest per capita availability of milk to the people. A regular agro-based and agro-oriented industrialization has been another prominent feature of the state economy. No less commendable has been the efforts at strengthening the infrastructure, particularly irrigation and power. The cumulative effect of all this is manifest in the highest per capita income of the state, a position of pride which Punjab has been holding for most of the years since its formation in 1966. A paradox may be stated here and explained: Despite its relatively high-income level, the state is noted for considerable outmigration to other parts of India as also emigration to several countries. This is attributed not to any distressful situation at home but to attraction of greater prosperity outside.

Historically, Punjab has experienced many upheavals and turmoil, which, in turn, have influenced its path of development. In fact, the administrative map of Punjab has undergone stupendous changes in the past. At the time of the partition of the Indian sub-continent in 1947, Punjab was bifurcated into two parts: West Punjab (Pakistan) and East Punjab (India). Of its 3,59,179 square kilometres and 29 districts only 1,52,649 square kilometres and 13 districts were left with Indian Punjab. The most prosperous and developed western part went to Pakistan and the relatively backward eastern part remained in India.

Punjab now with an area of 50,362 square kilometres and a population of 2,42,89,296 persons are one of the smaller states of India. The state accounted for 1.5 per cent of the total area of the country and 2.4 per cent of the total population in 2001.

Being a border state, both external as well as internal changes have influenced the path of development. In 1947, the state was partitioned. In 1966, the state was trifurcated into Punjab, Haryana and Himachal Pradesh. The period of militancy, in the recent past due to an internal crisis, had its own influence on shaping the development pattern of the state. Despite all this, it has been able to achieve remarkable success in accomplishing reasonable conditions for a better standard of life.

The development was in accord with the prevailing infrastructure in the state. Its flat physiography has helped laying roads and creating infrastructure at low cost, which is very difficult in a hilly tract. Higher accessibility to services and the strong linkage between rural and urban areas are partly due to this flat physiography. However, its weak points are deteriorating soil health, change in the water table, and lack of minerals and fossil-fuel resources.

The perspective of development that Punjab identified for itself was to boost economic development through the improvement of the rural areas. Rural development was to be achieved through agricultural development, rural electrification, and road connectivity. The state economy has been characterized by the predominance of the agriculture sector, the base for which was available and further developed in a planned manner. Agriculture has been the backbone of the state economy. Even though the share of the agricultural sector has declined, yet two-fifths of the state domestic product is from this sector alone.

The state economy, which was growing at a faster pace than the national economy until the late seventies and was moving ahead almost at the same pace during the eighties, received a setback in the nineties. During the last decade, the annual growth rate of the state economy was slower (4.7%) than that of the national economy (6.9%). Punjab held the top position in per capita income among the major states at the beginning of the nineties, but came down to the fourth place by the end of the decade.

Taking a longer-term view, the share of the primary sector has decreased considerably, from 55.1 per cent to 42 per cent during last three decades or so; the share of the secondary sector on the other hand has increased from 18.1 per cent to 27.5 per cent, and the tertiary sector has recorded a marginal rise from 27 per cent to 30.5 per cent. As required, the major share of expenditure during all the plan periods was reserved for irrigation and power, the critical factors for development of agriculture and industry, respectively. The sad part is that the investment on these two has not given matching returns. There is an unbearable amount of subsidy involved in both. Among other factors, such a situation has led to a considerable decline in the share of development expenditure, from 72 per cent in 1980-81 to 44 per cent in 1999-2001.

Agriculture in the state found a favourable environment in the extensive level topography, sub-tropical continental climate, fertile soils, and favorable conditions of water supply through water bodies and irrigation. All this provided a favorable foundation for the green revolution. The state's remarkable success in agriculture laid down a base for rapid strides in other sectors of the economy. Today, however, the agricultural sector is going through a crisis. Constraints in respect of a shift from wheat-rice rotation to other crops and difficulties involved in the virtually static level of per hectare yield of rice and wheat are symptoms of the crisis in this sector. There is urgent need to diversify not only the cropping pattern, but also the economy, towards non-farm activities.

Fortunately, for the state, large/medium industries are picking up, as also small-scale industry. This is not to say that industry is free from any problem. These are several, especially those relating to technology upgradation, marketing and foreign investment. These call for speedy resolution, if the problem of rising unemployment among the educated youth, in particular, is to be taken care of,

Despite a strong concern for the development of human capital and a perspective for eliminating the worst forms of human deprivation, the state's achievements are mixed. Its infant mortality rate of 52 in 2000 was a little less than the world average, but four times more than Kerala. With a sex ratio of only 874 in 2001, the state ranked 27th among the 28 states of India. The most telling commentary is that, of the ten districts in India noted for the lowest sex ratio in 0-6 age group, seven are in Punjab. There is something seriously wrong in the social sphere of this economically progressive state.

Punjab now needs to prioritise its requirements for making rapid strides. The foremost task ahead is to revive the decelerating rate of its economy. Acceleration must be achieved by the end of the 10th plan. An upgradation of human capital is basic to ensuring a sustained economic development of the state. Improvement in the quality of infrastructure, transport, telecommunication, information technology and irrigation are the prerequisites for achieving sustainable development. It follows that Punjab has the twin task of accelerating economic growth and upgrading human capital by 2020, so as to ensure sustainable development.

Development and Management of Natural Resources

Major natural resources of Punjab are land and water. Both have been over-exploited due to intensive agriculture.

Most of the agricultural soils are nutritionally exhausted and have an all time low level of organic carbon contents.

Over the years the underground water level has gone down by 10 to 15 metres in the central zone. Efficiency of canal irrigation is hardly 40 per cent as against the optimum of 60 per cent in the case of irrigation.

More and more cultivable areas are going out of cultivation due to water-logging and soil salinity, while conservation efforts for reclaiming degraded soils and recharging underground water are slow and inadequate.

The scarce forest cover of Punjab lacks appropriate conservation efforts.

Fiscal and Financial Management

Punjab economy decelerated during the 1990s, after recording the fastest growth in the seventies and mid-nineties. Factors, which seem to have adversely affected the state's fiscal situation over the past 15 years are a high salaries and wage bill, mounting debt burden, heavily subsidized social and economic services, slow growth of revenue and loss-making PSUs.

Public debt has been a convenient tool for raising resource and the state continues to rely on borrowings to finance its deficit.

The tax base in Punjab continues to be narrow and tax compliance poor.

The ratio of own tax percentage to GSDP has been consistently lower than in the six fast growing states of the country.

Relatively higher revenue expenditure, with lower resources mobilization, indicates scope for improvement in the revenue deficit by improving the tax ratio to GSDP.

Punjab continues to rely heavily on raising funds through the expensive route of small savings. With the reduction of interest rates there is a possibility of swapping expensive loans with cheaper funds.

The state continues to forgo and dissipate scarce resources by giving concession and freebies amounting to Rs. 900 crore per year.

Current Financial Position of Punjab

- Revenue deficit is Rs. 3,842.00 crore. 5.48 per cent of the GSDP.
- Gross fiscal deficit is Rs.5,211.00 crore, 6.92 per cent of the GSDP.
- Public debt at Rs.33,037.46 crore, 47.16 per cent of GDP.
- Annual interest liability at Rs. 3,149.00 crore accounts for 32.71 per cent of the state's revenue.
- Revenue receipts are not enough even to pay salaries, pension and interest and other committed expenditure, which was 112 per cent in 2001-02.
- With such a record it is not possible to approach multilateral funding agencies, financial institutions and capital markets for funding development programmes.
- The government will not be able to access funding under Centrally Sponsored Schemes in the absence of the desired sectoral reforms and its inability to contribute its own share.

Immediate attention needs to be paid to correcting the revenue/fiscal deficit and substantially reducing public debt. The measures required are:

- Fiscal deficit, which at present is around seven per cent of GDP be reduced to 3.5 per cent by the end of 2007.
- Revenue deficit be reduced by 0.5 per cent per annum with 1999-2000 as the base year and reduced to zero by 2007.
- Public debt as a percentage of GDP be reduced from 47.16 per cent currently to 25 per cent by 2007.
- Committed expenditure, which is 112 per cent of the revenue, should be reduced to 60 per cent by 2007.

Structural Fiscal Measures

- A three-year rolling budget from 2002-03 onwards, for the sake of consistency and continuity.
- Action taken report (ATR) on announcements made in the budget.
- The Punjab Fiscal Responsibility Act will ensure long-term financial stability and put a cap on state borrowing, state guarantees and deficits.
- Revision of user charges for services, such as transport, drinking water, technical and medical and higher education, secondary and tertiary health care, to finance improvement of quality.
- Stop issuing of future government guarantees and create sinking fund for the purpose.
- The State Finance Department should compile a quarterly statement of its income-expenditure and make it available for wide circulation, for the sake of transparency and accountability.

Other Measures for Improving Fiscal Health

- Strict enforcement of tax laws for higher yield from sales tax, registration/stamp duty and motor vehicle tax.
- Compression of non-tax and non-plan expenditure.
- Enhancing quality of public expenditure and governance.
- Aggressive disinvestments in public sector undertakings.

- Power sector reforms and improving the finances of the PSEB by implementing in full the recommendations of the State Electricity Regulatory Commission Report.
- Diversification of agriculture.
- Improvement in the quality and delivery of education and health services.
- Fast-track disinvestments of PSUs.
- Accessing capital market for infrastructure development through bankable projects.

The economy of Punjab cannot improve in isolation. It should be the outcome of political consensus. The growth of the economy has to be a long-term programme to be continued with the same tempo, zeal and fervour, irrespective of the type or shade of the political party in power.

With these extensive reform measures the budgetary support can be accessed from the World Bank (WB), supported by a 'Project Report' highlighting the state's development and poverty alleviation programmes. The WB prepares a Project Report at its own cost. Ordinarily the World Bank and other international institutions look forward to support development plans, which are growth-oriented and self-sustaining in the long run.

Measures for stabilizing the financial position of the state should be strictly enforced so that growth of revenue income and control of expenditure bring down the revenue deficit to zero and fiscal deficit to 3.5 per cent by the end of 2007. The fiscal scenario in 2012 and 2017 at the end of the 11th and the 12th Five Year Plans respectively, and up to 2020, should generate revenue surplus in each year after 2007-2008, provided the structural fiscal reforms, as suggested, are consistently implemented, particularly the levy of user charges on a cost-plus basis. This will attract support from international financial institutions and the private sector for augmenting non-budgetary funds for accelerated development.

Without tough measures to consolidate the fiscal situation and accelerate structural reforms, including abolition of untargeted subsidies, the fiscal position of the state is not likely to improve. The longer the fiscal deficit goes uncorrected, the greater the risk of steep reduction in the developmental activities.

Development of Agriculture and Allied Sector

Punjab is an agriculturally progressive state producing over eight tonnes per hectare of wheat and rice, with 94 per cent of the cropped area irrigated, and 186 per cent cropping intensity. It uses 184 kg/ha of chemical fertilizers and has 9.35 lakh tractors in use. Lately, agricultural activities have begun to show signs of fatigue, because of:

- Monocropping of paddy and wheat with attended manifestations of stagnating yields, increase in cost of production and low returns.
- Over-exploitation of water and soil resources.
- Declining public and private sector investments.
- Inadequacies in marketing, pricing and processing of vegetables, fruits and other crops.
- Dwindling agricultural research and extension inputs.

Agricultural development can be rejuvenated through:

- Crop diversification with high yielding, remunerative alternative crops, supported by pricing and marketing.
- Soil, water and environmental conservation.
- Efficient management of input-use for increasing crop and animal yields.
- Facilitating contract, commercial and organic farming.
- Introduction of corporate sector in services and agro-processing sectors.
- Re-vitalization of research and extension.
- Re-orientation of subsidies in the light of WTO.
- Strengthening Panchayati Raj and co-operative systems.

Rural Development

The term rural development connotes overall development of rural areas, to improve the quality of life of the people. In the Indian context, rural development assumes greater significance as three-fourths of its population still lives in rural areas. Strategically, the focus of planning was to improve the economic and social conditions of rural society, especially its underprivileged sections, thus, economic growth with social justice became the proclaimed objective of the planning process under rural development.

In the case of Punjab, high priority was given to setting up local-level administrative infrastructure at the block level, to promote agriculture and allied activities to meet the food grains requirements of the nation during 1965-66 to 1980-81. As production increased, expenditure on infrastructure development such as irrigation, communication, pavement of streets, construction of drainage and village betterment also increased. Better infrastructure further helped in increasing production. Although the spread of the green revolution has helped rural society in increasing levels of living considerably, today rural Punjab is facing a peculiar situation arising out of increasing cost of production and stagnating returns in the agricultural sector. Moreover, the value addition of agricultural produce cannot take place because of low investment flow towards agro-processing activities. This has resulted in less employment avenues for rural unemployed. Despite better rural infrastructural facilities than other Indian states, rural Punjab has lagged behind in terms of social and human development. Moreover, within Punjab there are disparities between rural and urban areas in accessibility of basic facilities in respect of households having pucca houses, toilet facilities, electricity connections and safe drinking water. The situation regarding education, health and demographic indicators too is no different. Punjab has one of the lowest sex ratios in India. In rural areas too the sex ratio is on a lower side. In spite of increasing flow of credit, the share of institutional credit has not expanded at the required level, towards crop diversification and promotion of the rural non-farm sector.

Though decentralized planning under the new Panchayati Raj set-up has also brought with it the decentralization of finances and delegation of powers, however, in actual implementation these are not given to PRIs. Even time-bound action plans have not yet been developed for state, district and block levels, for organizing orientation/education training programmes for the representatives of PRIs and development functionaries.

Industrial Development

The industrial sector has shown impressive growth during 1980 to 1997, covering the Sixth, Seventh and Eighth Five Year Plans, but declined in 1997 to 2000, the first three years of Ninth Plan. During 1980-2000, employment increased three times, the number of industrial units five times, investment and production 18 times, both in the large and medium and small scale sector. Small-scale industry (SSI) accounts for 80 per cent of the total employment, contributes 40 per cent to production and 60 per cent to exports, with 20 per cent investment of the industrial sector.

Regional disparities in industrialization persist. Ludhiana, Patiala and Ropar districts account for half the industrial production in the state. On the other hand, Faridkot, Mansa and Muktsar districts have a share of less than one per cent each.

The SSI sector, the backbone of the industrial economy in the state, is passing through a critical phase, mainly on account of such factors as low level of technology resulting in low industrial productivity and poor quality of products leading to competitive disadvantage both in domestic and global markets. The small-scale sector has to acquire the capability to produce quality products, to compete in the international market. It has to transform itself from a protective to a competitive environment.

For the survival of industry and to sustain the tempo of growth, the broad measures suggested are modernization and technological upgradation through innovative R&D; product adaptation; human resource development through skills upgradation and training; planned development of quality infrastructure; market-oriented policy and institutional framework.

The state must follow a pro-active policy to promote partnership with industry for both utilizing existing infrastructure and establishing badly required new facilities.

The government's role should be limited to that of an effective facilitator and co-ordinator of the process of growth, providing transparent, conducive policy framework and efficient delivery mechanism through good governance.

Upgradation of existing research and development centres in the state has been suggested so as to provide the latest design and testing techniques to the industry. Keeping in view the emerging requirements of industry and lack of financial support from central and state governments, the management of these may be entrusted to the relevant associations of industry, on the basis of binding partnership protocols evolved through a consultative process. This approach will ensure effective working of R&D centres to meet their objectives.

Industrial clusters and parks should be set up sector/product-wise, with a focus on agro-food processing, bicycle and bicycle parts, automobile and automobile parts, machines and machine tools, sports goods, leather and leather goods, hosiery and textile industries. This will facilitate building a centralized and modern infrastructure. The private sector and financial institutions should be encouraged to participate in these activities. In addition, infrastructure in all existing industrial areas and focal points should be upgraded.

Agri-export zones (AEZs) for different products should be set up expeditiously. These will facilitate provision of all export incentives to boost exports, centralized modern

facilities, value addition, better productivity and higher incomes to the farming sector. The Government of India should also set up special economic zone, (SEZ), for linkage with the global market with focus on the export of industrial products.

It is essential to set up industries in the large and medium (L & M) sector in the state for their balanced growth. Appropriate facilities and incentives should be provided to multinational companies (MNCs) to set up manufacturing facilities in the state, especially in agro-food processing, light engineering and electronic hardware industries. NRIs should be encouraged to invest in the state.

An appropriate institutional mechanism, consisting of representatives of the Reserve Bank of India, financial institutions, banks, industry and state government, with adequate powers and the resources, should be created, to provide requisite financial support to small-scale units suffering from sickness or showing symptoms of sickness. A system should be evolved for timely detection of sickness at the initial stages for speedier necessary action.

The tax structure should be simplified and rationalized, compatible with that of the neighbouring states. Easy and timely credit at interest rate equal to prime lending rate (PLR) should be available to the SSI sector.

Infrastructure Development

Societal development uses infrastructure as a base, and therefore, it cannot be allowed to become a limiting factor in the process of development. Analysis of the vision reflected in the various plan documents reveals that the future of Punjab lies in changing the cropping pattern, agro-processing, and development of the service sector. This is in the light of the fact that Punjab is highly urbanized and will emerge as the most urbanized state of India by 2020.

Power

This vital sector is in the doldrums in Punjab. There is free power to agriculture, exorbitant rates for industry, and unpaid bills to both coal suppliers (Coal India) and transporters (Northern Railways). The Goindwal project is stagnating, with lending agencies staying away, because of the unsustainable economic basis of this sector in Punjab.

The possibility of a major increase in power generation in Punjab exists only via the thermal route. This is relatively inefficient, since transmission of electricity from pit-head thermals through grids is cheaper than carrying coal. Increase in thermal generation with attendant problems of ash disposal, is also undesirable ecologically. Punjab is already buying 25 per cent of its requirements, from other agencies, and this will go up to 50 per cent by 2015. The state should immediately act in accordance with the emerging road map in the power sector, and take advantage of trading power on the grid. The measures required include setting up of a functional State Electricity Regulatory Commission, and structural changes in generation, transmission and distribution.

Punjab should involve people in the reforms process. A participative model has been suggested that hands over distribution and user-charge collection to panchayats and

urban local bodies. An innovative scheme to bring about VRS in Punjab State Electricity Board by involving the surplus employees in power maintenance activities at the panchayat could also operate in tandem to further leverage the success of the rationalization of staff.

IT & Telecom

Punjab is treating this sector like any other government function, with 'departments', 'apex bodies', '(government) corporations'. This is precisely how IT & Telecom should *not* be dealt with. Government should stay away from any control aspect and act *only* as a facilitator. There must be no 'approvals' in the traditional mould; the emphasis of government should be only on removing bottlenecks.

As a priming aid to the IT services sector, the government should move in inducting IT in the state through two time-bound initiatives:

- e-governance at the government-public interface, such that the total cost of service deliveries goes down.
- bring in virtual 'mandis' through a State Commodity Exchange, to empower the farmer, and expose his produce to national and international trading.

In inducting IT in the government, it has been emphasized that no new jobs would be created for executives (programme data entry operator, etc.). The new employment will be automatically generated in the non-government IT services sector, in the task of laying down of links, writing software, and network commissioning and management.

Transport

The dominant forms of transport are roads and railways.

The government has laid down a policy for private participation in the road sector, but has made a fundamental error of allowing the bidders to shift the risk to the government. This should be reviewed; otherwise liabilities are likely to result. The toll-road model has really not taken off well in many states; and what is suggested is a model of petroleum-product taxation for road development. A levy of Rs 1/- per litre on MS / HSD should maintain the funds required for future road projects. The roads should be capable of handling container trucks to move produce for agro-processing. It is also suggested to make cycle tracks between towns and surrounding villages.

Railway infrastructure needs both strengthening and fresh creation. Using the power of the central government to permit taxation, a Punjab Rail Development Fund should be created by levies on passengers to and from Punjab. A large differential exists between road and rail fares, permitting the levying of such a cess. This fund can generate Rs 1,200 crore needed for rail infrastructure over the next decade.

Policy Recommendations

- The state should give up a subsidy-based approach and move towards a techno-commercial basis for infrastructure projects.
- Realize that users are willing to pay for services, provided their overall quality meets their requirements. People would rather pay for good services, than suffer a defective free service.

- Major reforms should be brought through people's participation, not governmental diktat.
- Induction of new technologies should not give rise to new bureaucracies, but result in enhanced service deliveries, through process re-engineering.

While the rural sector will remain important, a policy shift emphasizing an increasingly urban character to Punjab should be inbuilt in the decision-making processes.

Urban Development

In Punjab, which is the fifth major urbanized state in India and a highly urbanized state in the northwest region, the growth pattern of urban centres is creating imbalances in infrastructure, housing and level and quality of services. The situation is the worst in small and medium towns. City governments are financially weak and functionally unstable.

There is urgent need of an 'urbanization strategy' to cover the entire population with water supply, sewerage, solid-waste management, basic amenities, civic services and infrastructure; strengthen urban local bodies (ULBs) through devolution of functional and financial powers; capacity building of urban administrators; construction of connecting roads, housing in peripheral areas; and efficient transportation facilities with special emphasis on small and medium towns.

Local government, being a state subject, operates under state control. Legislations conforming to the 74th CAA have been passed but there has been no change in the functional and financial domain of ULBs. Fragmented functioning, due to parastatal involvement in municipal affairs, is affecting the functional domain of ULBs. There is need to reduce interference by the state government in municipal affairs. Constitution of Ward Committees, District Planning Committees and Metropolitan Planning Committees is a must for the empowerment of ULBs. The Mayor-in-Council/President in Council System will strengthen functional democracy in the state.

The fiscal domain needs to be strengthened by broadening the taxation powers of ULBs; levying new taxes; improving tax administration of octroi, property tax, water supply and sewerage charges; pricing and cost recovery; local resource mobilization and full implementation of recommendations of State Finance Commissions and Central Finance Commissions.

There are serious deficiencies in the volume as well as quality of municipal services and infrastructure. The task of financing urban infrastructure and services is challenging and needs Rs.6,000 crore at Rs.1,200 crore per annum. With the contributions of Urban Local Bodies at Rs.150 crore per annum, the Punjab Infrastructure Development Board at Rs.75 crore per annum and state government transfers at Rs.75 crore per annum, it will be easy to access Rs.900 crore per annum from the capital market. Additional resource mobilization of Rs.60 crore from property tax, user charges and fees and rents will help improve the fiscal base of ULBs and attract the private sector for financing urban infrastructure.

Raising municipal bonds for financing urban infrastructure calls for reforms, through rationalization of tariffs, pricing and cost recovery, preparation of commercially viable

projects, investment-grade credit rating, effective billing and collection, asset management and upgradation of professional skills of municipal staff. Pooled financing mechanism will enable smaller ULBs to raise funds for financing infrastructure. A state level regulatory body should be created to monitor quality of services, prices charged and involve private sector participation (PSP) in infrastructure development and service delivery.

PSP and people's involvement in municipal affairs and urban development activities should be promoted to offload financial, functional, managerial and administrative burden of ULBs. PSP in water supply, sewerage, solid-waste management, maintenance of parks/street lights, bill distribution, etc., on the pattern of municipal towns of Hyderabad, Alandur, Tirupur, Rajkot, Pali, CIDCO (Mumbai), Belgaum, Hubli, Mysore and Ludhiana can help ULBs of Punjab to improve O&M of services, pricing and cost recovery and infrastructure development. People's involvement in municipal affairs on the pattern of Baroda Citizen Council (BCC), EXNORA (Chennai), SRISTHI (Delhi), Muskan Jyoti Scheme (Lucknow), Surat Citizen Council, and Urban Community Development Project (Pune) can dramatically improve sanitation, sensitise people to comply with user charges, urban poverty alleviation and slum development. The Government of India introduced Urban Reform Incentive Fund (URIF), City Challenge Fund (CCF), Pooled Finance Development Scheme (PFDS) and constituted a Task Force in its budget of 2002-03 to promote PSP in urban infrastructure development.

Housing is a must for low-income groups and below-poverty line population. In Punjab, the requirement of funds for this purpose is huge and HUDCO, National Housing Bank (NHB) and BMTPC are not doing much to provide housing to vulnerable groups. The Government of India, through NHB, introduced 'Mortgage Guarantee Scheme' to protect lenders against default and formulated the National Housing and Habitat Policy (1998). It constituted URIF to provide reform-linked assistance as an incentive for reforms in rent control laws, simplification of legal and procedural frameworks for conversion of agricultural land and revision of by-laws. The Punjab Government needs to revamp its institutional set-up for housing, provide housing loans at affordable interest rates, raise funds from the private sector through PIDB, involve ULBs and promote development and use of low cost and locally available material and user-friendly technologies for construction of houses for the poor.

Slums/slum population need immediate attention. Programmes and schemes should be implemented properly for improving the living conditions of slum dwellers. The state must utilize central government grants. Slum dwellers should be involved in slum development activities and assistance from national and international agencies should be mobilized.

In Punjab, urban poverty is an issue but of dimensions different from other states. It manifests itself in various forms such as deprivation of shelter, basic amenities, such civic services as education, health and calories, and miserable living conditions. The poverty level of Punjab, as defined by the Planning Commission of India, is slightly higher than Bihar and considerably lower than U.P., Orissa and Rajasthan. A slight upward revision of the poverty line can raise the number of the poor considerably. District-wise trends of urban poor indicate that Ludhiana and Jalandhar districts have the largest number of urban poor (i.e., more than 50% BPL families), and hence require immediate attention. Poverty alleviation schemes have not had much impact because of the inadequate participation of the poor, lack of convergence of line-departmental

schemes and programmes. Programmes and schemes need to be re-oriented in the pattern of Kerala and Self Employed Women's Association (SEWA) of Ahmedabad. ULBs should create poverty alleviation funds with special emphasis on employment, security and opportunity as envisaged in the *World Development Report 2000-01*.

Punjab's future is urban. By 2020, Punjab will have about 45 per cent urban population or even more. At present, deficiencies in urban infrastructure/services are crucial problems of urban development. The slums/slum population, urban poverty, houselessness and poor fiscal position of ULBs are inhibiting sustainable urban development. Without a long-term urban development strategy, cities, big and small, will become unmanageable, unlivable and unproductive.

Well managed 'urbanization' will facilitate and sustain economic growth, improve service delivery and develop environmental infrastructure to improve the quality of life. The 'urban development strategy' should promote good governance, provide cent per cent coverage of basic civic services and adequate housing to the shelter less urban poor, reduce urban poverty and emphasize on efficient management of municipal assets and development of municipal lands for income generation. Protection of urban environment, involving the private sector, for low cost and efficient delivery of services, offloading functional and fiscal responsibilities, ensuring people's participation in urban affairs and change of current policies and practices including legal and administrative reforms, are the other aspects which constitute essential components of a forward-looking development strategy. The vision for urban areas of Punjab by 2020, or even earlier, is one of sustainable development. In the short term, emphasis should be on full coverage of the population with infrastructure and services as part of a long-term perspective, qualitative improvement of governance, urban basic civic services and environment protection.

Demographic Development

Fertility has been falling consistently in Punjab since the beginning of the 1970s and the state has reduced its total fertility, approximately by half, from the early seventies to the late nineties in a totally different socio-cultural environment. Except for 1977-79 to 1982-84, during which the decline stalled, the process of fertility transition is reasonably consistent in Punjab. Diminishing crude birth rate (CBR) and total fertility rate (TFR) point towards new environment of reproduction in Punjab. The decline in fertility is extensive in the state, and is not confined to any specific community or region. Rural and urban areas are experiencing transition in fertility in different ways in the state, depending on changes in local conditions. The sizeable decrease in fertility, despite some of the key social indicators, such as strong son preference, sizeable presence of socially backward population and relatively higher infant mortality being against the decline, is a manifestation of the primacy of intervention by selected development factors, namely, the family planning programme, female literacy and prosperity at the household level. The age pattern of childbearing in Punjab has undergone a change during the last three decades with fertility limitation being increasingly common at relatively old ages. Though fall in fertility has been observed among women in all ages, the contribution to the fertility decline has been mostly from women in the age 35 years and above. Recent indications do not signal the possibility of reaching the replacement level in the state by 2010, and the state's fertility is estimated to be 5-24 percent above the replacement level, with sharp rural and urban variation. With nearly two-thirds of the

population still living in villages, the prospects of stabilizing the population in the near future in Punjab depends on the success of the population control effort in rural areas. Fertility differentials are sharp, and over time, there has been little change in relative positions by social or economic class in terms of the respective contribution to overall fertility, though the major social and economic groups have shown a decline in current pregnancy rates and fertility.

Both rural and urban areas gained consistently from the onset of mortality decline, even if rural death rates continue to exceed urban death rates in Punjab, as elsewhere in India. Gains to males as well as females from mortality decline are distinct over the years, with net gain to females, notwithstanding early-age vulnerability, surpassing the gains to males in the process of mortality transition. In fact, a notable feature of mortality transition between 1971 and 1998 has been the larger gains for the females than for males in general. The narrowing down of sex differential in mortality, characterized by comparatively higher female mortality, has yielded to a reverse, yet, more common pattern, where male crude death rate outstrips female crude death rate. At some specified ages, the sex of the individual is one of the important indicators of exposure to death. While female mortality-disadvantage is greatly pronounced during childhood and adolescence (0-14 years), male vulnerability begins to be high from the age of 20 and onwards. In spite of a seemingly lower infant mortality rate (IMR) in Punjab, than in most of the major states of India, the number of deaths before the first birthday is very high. Mortality, among infants is not showing signs of real decline since the early nineties. Reasons for this merit some investigation, in the context of the link between overall economic deceleration in Punjab and living standards of households, particularly in the rural sector. Infant and childhood mortality in Punjab is characterized by sharp sex-differential between male and female children. Data show comparatively high female mortality in Punjab than in other states of India. In spite of improvements in literacy, expansions in outreach of health care services and overall standards of living in recent times, the sex composition of infant mortality trends in Punjab indicate greater vulnerability of the girl child remains virtually unchanged. On the contrary, more recently, data reveal intensification of gender disparity in mortality in Punjab at every stage of childhood, particularly before the fifth birthday. Rise in female disadvantage in mortality between 1992-93 and 1998-99 is a worrisome sign, implies preponderance of social, cultural and economic rather than health and medical factors, and reinforces the need for corrective measures.

Lack of knowledge about contraceptive methods is no more a barrier to spread of family planning, as knowledge about any method of contraception is most widespread in Punjab (100%). It is interesting to note that among different methods of family limitation--condom, intra-uterine device (IUD) and pill--are most well known in Punjab than in any where in India. In general, modern methods are better known among the eligible women (100%) than the traditional ones (78%). Rural areas almost match urban centres in the knowledge of modern contraceptive methods, but the later have an edge in the awareness of some traditional ones, namely the rhythm or safe period and withdrawal. Social, economic and demographic backgrounds of the couples are no more a determining factor in the spread of awareness regarding methods of family planning. Comparison of sources of contraception by current users between 1993 and 1999 points towards the growing role of the private sector. In Punjab there are indications of virtual non-existence of social marketing outlets in rural areas for the oral pill and condom. Available outlets have meagre stocks of supplies, depend more on government sources for procurement of supplies, and secure better participation of women than men in the

majority of the villages. The social marketing network is marked by little segmentation of clients, poor need-based vending, limited access, cultural insensitivity and lack of motivation. On a better side, Punjab is widely recognized for its good performance in implementing the family planning programme. Since the inception of the programme, as compared to the national average, the contraceptive prevalence rate (CPR) has consistently remained high in Punjab. Apart from awareness, the growth in CPR can be attributed to vigorous programme implementation strategies, mainly tagged to incentives and disincentives to programme-staff and clients.

Attempts at greater economic and social development in Punjab must also include focus on demographic dynamics. The contours of population planning must go beyond the goals set in the National Population Policy and cover grounds that are central to larger issues of human development. Some of the direct and foreseeable demographic challenges that Punjab faces today can be outlined as attainment of replacement level of fertility, elimination of early-age child-bearing, reducing infant and childhood mortality coupled with excess female disadvantage, getting rid of sex-selection during conception and practice of female foeticides, balancing a skewed sex ratio that is highly masculine among children, eliminating extensive son-preference, raising low hospital delivery rates resulting in undesirable maternal deaths, changing the unfavourable demographic regime among socially and economically weaker sections, meeting the unmet need for contraception, promoting men's participation in family planning, removal of regional demographic disparities, and preparations for dealing with an ageing population. Enunciation and implementation of a State Population Policy can be an effective instrument of desired demographic change in Punjab.

Health

During the formulation of each of the Five Year Plans, the state government has continued to focus largely on strengthening the health infrastructure in the form of buildings, machinery, equipment and manpower for primary health care. It has not realized the importance of having a proper health-management information system, which would have helped in setting need-based priorities. Moreover, the state did not make much effort to establish referral linkages, management of life-style diseases -- diabetics, cancer and cardiovascular diseases, regulation of private health care services, and involving the voluntary sector in various health programmes.

Analysis of allocations and expenditures indicate that during all Five Year plans, outlays for MPH have remained between 1.9 per cent and 4.5 per cent of the total outlay, nutrition between 0.04 to 0.5 per cent and other social services between 12.3 to 28.3 per cent. On the other hand, expenditure patterns indicate that in reality the percentage share of MPH had been between 1.5 and 2.5 up to the Eighth Plan, rising to 4.2 per cent during the Ninth Plan. The percentage share of nutrition was insignificantly low at 0.04 to 0.3 of the total expenditure during all the Five Year Plans. However, the share of expenditure on other social services (excluding MPH and nutrition) rose considerably during all the Plans, from 10.8 per cent in the Fourth Plan to 24.0 per cent in the Ninth Plan. This indicates clearly that health and nutrition has been accorded a lower priority among the social services.

Punjab has 2,852 Sub-Centres, 1,465 Subsidiary Health Centre (each having a medical officer and a pharmacist), 484 PHCs, 117 Community Health Centres, three medical and

two dental colleges along with attached hospitals. In addition, 40 mobile dispensaries have been provided for intensive health care to serve the population living within 16 km of the international border. There are 230 Allopathic hospitals in the state. They range from 50-beds hospitals in smaller towns to larger hospitals attached with the five medical colleges, one each at Patiala, Faridkot and Amritsar and two at Ludhiana having facilities for dealing with complicated cases and acting as referral hospitals and teaching colleges. There are 473 Ayurvedic dispensaries, 17 Ayurvedic Swasthya Kendras, five 10-bedded Ayurvedic hospitals (one each at Jalandhar, Bathinda, Ludhiana, Hoshiarpur and Amritsar), and one government Ayurvedic college at Patiala, 105 Homeopathic dispensaries, and 34 Unani (Arab/Persian medical system) dispensaries in the state to promote the Indian system of medicines and Homeopathy (ISM&H). The state has one doctor for every 1,470 of the population, and one hospital bed for every 864 people -- ratios that are probably the best in the country. There have been significant improvements in the average radius covered per institution and a consistent increase in the availability of manpower (both medical and para-medical). The provision of health institutions in the state increased 4.5 times (6.4 times in rural areas and two times in urban areas) during 1966-2001. The percentage share of rural health institutions improved from 55.4 in 1966 to 81.6 percent in 1990. The local self-government and the voluntary sector have withdrawn from the health sector. No information is available on the number of private practitioners, number of private clinics and nursing homes.

The incidence and prevalence rates of morbidity patterns in Punjab are higher than the all India average. Morbidity is higher in rural than in urban areas. More people suffer from chronic diseases with increase in age. Education has not had much impact on the morbidity patterns, except that the reporting of illness was less among the illiterates, or not formally educated, in both rural and urban areas of Punjab. There were fewer patients with chronic diseases in rural areas of Punjab compared to all-India and vice versa for urban areas. The number of persons reporting ailments generally increase with increase in age. Chronic illness is generally more prevalent among those who are 40 years, or older. Reporting of ailments is generally higher for general castes than the Scheduled Castes. Examination of the reasons for untreated episodes of sickness reveals that in the majority (83%) of the cases treatment was not taken because the ailment was not considered serious. Financial reasons were cited by very few persons (six percent in rural areas and two percent in urban areas).

Regarding the utilization of health care services, NFHS-2 indicates that the public sector is the major provider of vaccination for children in Punjab. Eighty-eight percent of all the children received vaccination from the public sector, but for curative services, a large majority of households (86%) normally visit the private medical sector. In fact, the use of private sector is much higher in Punjab than at the all India (69%) level. Allopathic treatment is the most preferred form in both the rural and urban areas of the state. The people here believe less in obtaining treatment from a medical shop, or store in the adjoining areas, than in other parts of India. Households in Punjab also do not believe in going to faith healers or religious persons for treatment. The percentage of ailments receiving non-hospitalised treatment from government sources in Punjab declined from 12 per cent to seven per cent in rural areas, and 11 per cent to six per cent in urban areas, during the 42nd and 52nd rounds of NSSO. Though the all-India trend shows a similar picture, the gap is not as steep as in case of Punjab. As for non-hospitalised cases, the cost of treatment is less in the private sector than the public sector, in both the rural and urban areas of Punjab and in the country as a whole. Cheaper outdoor treatment in the private sector indicates that it is striving to provide curative services at

par with the public sector in the state. The cost of treatment is usually higher for males and boys than for females and girls, in Punjab as well as all-India. At least, two-thirds of the cost of medical treatment is towards fees and medicines. The cost for clinical tests in rural areas is higher than in urban areas. These are expensive in both rural and urban areas of Punjab, as compared to all-India.

The health status of women and children in Punjab is reflected in such depressing features as the declining sex ratio (874 per 1000 live births), high proportion of IMR (51 per 1000 live births) and a high prevalence of anemia. Thus, women and children in Punjab are the vulnerable sections and their needs call for precedence. Antenatal care has moved down on the priority list of the para-medical staff. Non-utilization of antenatal care, particularly among women in rural areas, has increased from 13.6 per cent in 1992-93 to 30.8 per cent in 1998-99 (NFHS I & II), causing different kinds of health problems among women and children. Less than two-fifths of the deliveries in Punjab are institutional (37.5%). Privatization of maternity health care services is much evident in Punjab, particularly for conducting deliveries and treating reproductive health problems. This is increasing the number of caesarian section births in Punjab. It has doubled from 4.1 per cent in 1992-93 to 8.2 per cent in 1998-99 (NFHS I & II), and particularly in urban areas (NSS 52nd round), either because of inadequate antenatal care or vested economic interests of the doctors.

Obesity as a problem exists amongst women in Punjab. With 30.2 per cent obese women it ranks second, next to Delhi (34%). Prevalence of anemia amongst women and children exists and has serious implications. In Punjab, 80 per cent of the children (in the age group 6-35 months) and 41.5 per cent women (in the age group 15-49 years) suffer from anemia. The state has 8.9 per cent of its population facing the risk of fluoride deficiency as compared to 6.9 per cent at the national level. The Iodine Deficiency Cell has enforced ban on the sale of non-iodized salt to reduce iron deficiency. It can be further reduced by enforcing food fortification. Considering the level of urbanism and the impact of consumerism in Punjab, fortified food would be a welcome change. Breast feeding practices in Punjab are faulty and can be enhanced significantly by increasing institutional deliveries. Women delivering in public institutions are reported to be following the right kind of breast feeding practices (14.2 % within the first six hours) and not wasting the first milk by squeezing out the precious colostrums, which is vital for child survival. Dietary patterns in Punjab reveal that, the consumption of milk is higher than in the other states in India (875 grams per day). Further, a decline in the intake of calories and proteins is evident, while there is an increase in the intake of fats.

Education

School Education

Punjab ranks 16th in terms of literacy among Indian States and Union Territories. Although the literacy rate has increased from 58.51 per cent in 1991 to 69.95 per cent in 2001, an overall increase of 11.44 per cent, there are still 95 lakh illiterates in the state (2001 Census).

There has been a quantitative expansion of educational institutions. The total number of schools increased from 9,394 in 1970 to 16,038 in 1980 and further to 18,998 in 2000-2001. The most massive expansion has taken place at the primary level. Today, except

for some remote areas, every village has access to primary schools. However, 16 per cent habitations do not have access to an elementary school within the norm of three kms. Further, the shortages of secondary schools within a distance of five kms, and senior secondary schools within a distance of eight kms are ten per cent and 20 per cent, respectively. Nearly one-fourth of the children is either not enrolled in schools or are in unrecognised schools. There are still about 2.97 lakh children of 6-14 age group who are out of school.

The share of government schools in total enrolment in primary classes is gradually decreasing and has come down from 71.86 per cent (1996) to 66 per cent (2000), but there has been a larger growth in the share of unrecognised private schools from 19 per cent to 25 per cent during the same period. It reflects the disenchantment of the public with government run schools. Punjab has the highest number of students enrolled in private schools after UP.

Although the dropout figures in Punjab have declined to some extent, its rate is still very alarming; 20 per cent of the children drop out at the primary level, 37 per cent at the middle level, 40 per cent at the secondary level and 78 per cent at the 10+2 level. It is shocking that out of 100 children enrolled in class I, only 22 reach senior secondary level.

Infrastructural facilities and civic amenities are lacking in the schools. There are schools without buildings and many of those with building, need urgent repairs. These are in a dilapidated condition and have been declared unsafe for use as classrooms. The majority of the schools are also facing the problem of shortage of toilets, classrooms, playgrounds, boundary walls and verandas.

Apart from physical inputs, the most glaring weaknesses are lack of motivation in teachers, outdated teaching methodology and unskilled teachers. Although Punjab has a respectable pupil-teacher ratio of about 41 at the primary level, a one-way dialogue between teachers and students has remained the norm and learning by rote the only methodology. Further, the education provided is hardly relevant to the day-to-day life of the students. The quality of teaching in schools can be judged by the poor examination results. At present 50 per cent of the students fail at the matriculation level.

The heavy syllabus prescribed and the faulty system of examination for awarding marks in most of the schools, adversely affect the quality of school education and fail to rouse the inherent creativity of the children. Schools without any sanctioned post of a teacher and teacher absenteeism are other causes of poor quality of school teaching.

The allocation of resources in education is only 2.88 per cent as against the target of 6 per cent of the SGDP. Further, 99 per cent of the expenditure on education at the primary level and 90 per cent at the secondary level go to meet salaries, leaving very little for development in other spheres of education.

Higher Education in Punjab

There has been vast progress in higher education since the reorganization of Punjab in 1966. According to the census figures of 1981 and 2001, not only has there been significant expansion, in institution building, but also considerable progress in

enrollment. Figures in the table given below show the comparative expansion between 1980 and 2000.

Significant Expansion in Higher Education				
Sr. No.	Institutions	Year		Increase (Absolute)
		1980	2000	
I.	Expansion in Educational institutions			
(i)	Universities	4	7	3 (75%)
(a)	General courses	3	3	- (-)
(b)	Professional courses	1	4	3 (300%)
(ii)	Colleges	188	287	99 (52.7%)
(a)	General courses	162	204	42 (25.9%)
(b)	Professional courses	26	83	57 (219 %)
II.	Expansion in Enrollment			
	Total Enrollment	91254	193665	102411 (112.2%)
(a)	Post-graduate level	6901	13848	6947 (100.6%)
(b)	Graduate level	84353	179817	95464 (113.1%)
III.	Enrollment of Women and Scheduled Castes to Total Enrollment			
(i)	Post-graduate level			
(a)	Women	50.5%	69.6%	(19.1%)
(b)	Scheduled Castes	7.4%	9.1%	(1.8%)
(ii)	Graduate level			
(a)	Women	39.9%	51.0%	(11.1%)
(b)	Scheduled Castes	8.9%	10.3%	(1.4%)

Issues and Recommendations

- District-wise Imbalances in educational status and development are significant. All the universities and three/four colleges are located in urban areas. Therefore, educationally backward and under-developed districts and rural areas must be given more attention.
- More educational institutions have to be established in rural areas with more vocational courses, to equalize educational opportunities.
- Existing resources must be optimally utilized for this purpose.
- As no autonomous institutions of higher education exist in Punjab, such colleges should, therefore, be promoted.
- There is no universal system of admission policy; even degree programmes are not organized on the basis of the established manpower needs; therefore, the admission system needs to be restructured.
- There is a wide gap in the enrollment status of students between upper-castes and lower castes. Therefore, education opportunities for the Scheduled Castes should be equalized. Further, distance education must be developed into a viable and effective alternative, to enable education reach most deprived and needy sections of the population.

- UGC recommendations of 200 working days in a year, 40 working hours in a week per teacher, 75 per cent attendance of students in a year, have to be adopted to improve the quality and accountability of higher education. The number of holidays can be reduced by papering date-based information of working norms in each institution.
- Subsidy to students belonging to better-off families should be removed and privatization of higher education encouraged to achieve better standards and status of higher education.

Labor and Employment

Areas of Concern

Though the rate of unemployment rate in the state is not very high as compared to other states of the country, it has increased from 3.08 per cent during 1993-94 to 4.15 per cent on current daily statuses during 1999-2000. This is a matter of concern. Urban unemployment rates are higher than those of rural rates. Unemployment among the educated youth is much more serious, especially among those with general education in arts, commerce and science.

The existing employment resources in the state are not large enough to provide adequate income and regular employment. Both visible and invisible underemployment is high in the state. It has increased during the period caused by the last quinquennial survey of NSSO. Casual labour, especially of rural males, at 28 per cent during 1999-2000 is high. There has been a marked increase in the percentage of those available for additional or alternative work, in both rural and urban areas during 1993/94-1999-00.

Female work participation rate has been very low in the state. It reflects the status of women empowerment. Large proportion of women workers in the state engage themselves in a subsidiary capacity in low productivity activities with very low earnings. Female marginal workers have increased over the decadal census period from 1.6 per cent in 1991 to 6.8 per cent in 2001.

The growth of organized sector employment, especially in the public sector has declined. The decline in the public sector is from 1.01 per cent during 1990-95 to 0.19 per cent during 1999-00. The growth rate of employment in the private sector too has also declined during the same period from 2.34 per cent to 0.80 per cent. A large proportion of workers (53%) still depend on the agricultural sector in the state for employment and income, despite disguised unemployment.

Special employment generating schemes for the poor have been playing an important role, by providing employment to them through wage employment and self-employment schemes, especially in the rural areas of the state, and creating economic and social infrastructures. However, the performance of these schemes is severely affected by several lacunae, as revealed by evaluation of the functioning of these schemes from time to time. These have prevented the near optimum utilization of the schemes concerned.

A large section of the labourforce (42%) in the state is illiterate. The proportion of skilled manpower is low. The quality of skills is low. Skill-imparting institutions in the state have

lagged behind in upgrading them. A large number of job seekers, trained through ITIs, are unemployed. There is a mismatch between supply of and demand for skill requirements. The present system of vocational training is not adequate.

According to Planning Commission estimates, if during the Tenth Plan period (2002-07) growth of employment continues to be the same as in Ninth Plan (0.73%) and the labourforce grows according to the projected demographic profile, the level of unemployment in the state would be higher than what was expected at the end of the Ninth Plan.

Suggested Steps

Special attention has to be given to generation of appropriate employment opportunities in the rural areas of the state. In fact, the major challenge is the replacement of existing low-level jobs with regular jobs. Efforts to provide decent employment to women should be made in order to properly empower them. There is need to study in detail the different activities in which women are engaged and the potential for their diversification.

It is only through the private sector that regular jobs can be created in the future. Hence, it has to be encouraged to invest in the state for the generation of more employment. Even through this process it might not be possible to generate substantial regular employment in the near future. A large volume of better quality employment has to be generated through self-employment, especially in the unorganized sector. Therefore, adequate policy steps have to be taken to promote self-employment opportunities.

The sectors which have comparative potential of higher employment generation in the future are agro- and food-processing, construction, trade, transport, communication, and other services. Faster development of non-farm activities, especially in the rural areas, will also be helpful in checking excessive rural-to-urban migration, thereby relieving pressure on the urban infrastructure. Special employment programmes for the vulnerable sections need to be effectively implemented after proper restructuring, making them leakage-proof through constant monitoring and fixing of responsibility for any lapses.

The ITIs and other technical institutions have to be upgraded and modernized as far infrastructure, staff and courses are concerned. All-out efforts are needed to promote vocational education. Industry should be involved in the management of these institutions. The role of the private sector has to be encouraged in imparting vocational training services. Such institutions as IITs and IIMs, which are known for quality and talent, have to be promoted and expanded. Proper manpower planning and human resource development must be given utmost priority.

However, it will not be possible to achieve significant improvement in the employment situation at the prevailing growth rate. Indeed, a very high investment rate is required if we want to achieve higher rate of growth of the state economy during the Tenth Five-Year Plan, along with an efficient use of scarce resources.

Labour/Industrial Relations in Punjab

Industrial relations constitute one of the most complex and delicate problems of the modern industrial production process. The structure of industrial relations in India draws

its spirit from the concept of a welfare state. Labour policy was directed initially towards maintaining harmony in industrial relations to ensure the realization of the objectives of National Economic Planning. Four types of institutions were created to deal with industrial conflicts: i) interventionist labour laws; (ii) industrial democracy; (iii) code of conduct, moral as well as disciplinary; and (iv) consultation machinery, collective bargaining, both bilateral and trilateral. Among all these, state intervention has played the most dominant and significant role. Wherever conflicts arose between employees and employers, the state came in to sort out problems. In this process the state introduced an array of regulations to maintain harmonious relations between employer and employees. Presently, in the wake of the new economic policy of liberalization, privatization and globalization, the government has started reducing its intervening role.

Industrial relations in Punjab are part and parcel of industrial relations in India. The broad pattern of industrial relations in the state is that the trade union movement, as in the rest of the country, developed along with freedom struggle of India. In Punjab, trade unions are strong in the organized sector and weak in the unorganized sector. The increasing trend in the state is of unions with large membership. Independent and small unions have decreased over the years. The future of trade unions without affiliation to central federations is totally unviable. The pattern of industrial disputes has been declining since 1991. The number of work stoppages has been going down since 1981. There has been a sharp downward trend in the number of workers involved in work stoppage since 1989. The number of man days lost has been fluctuating, especially since 1982. Maximum disputes have been raised by AITUC and CITU, both federations with left leanings. Issues related to wages, allowances, bonus and other matters are the primary causes of work stoppage in Punjab. Adjudication continues to be the most effective method for resolving industrial disputes.

Continuation of harmonious and peaceful labour relations has emerged as a subject for research in the present circumstances. However, emerging realities demand peaceful industrial relations, to attract investments. At the same time there is need for a suitable policy framework for ensuring adequate social security for labour, which is possibly a major condition for harmonious relations between employer and employees.

Information Technology: Growth and Development Strategy

The Indian software and service industry, comprising IT Services, IT Product and Technology Services and IT Enabled Services, has emerged as one of the fastest growing sectors in the Indian economy, with a growth rate exceeding 50 per cent in exports and 40 per cent in the total IT industry over the last five years. However, the share of Punjab in the total turnover and exports from India has been dismal. It was only 0.26 per cent of the total exports of India during 2000-2001

Some of the specific constraints for the growth of IT industry in Punjab are non-availability of the required quality of infrastructure and human resource, insufficient funds for the development and promotion of the sector, lack of direction, vision and a non-conducive environment. It is essential for the state to overcome these specific constraints. A target of five per cent share of the total turnover projected for India at US\$ 60 billion by 2007, has been suggested for Punjab. Although this is optimistic, it is achievable through a fast track approach. This will help to generate 99,000 jobs by the 2007, 77,000 in IT Enabled Services (ITES) alone.

Special emphasis is recommended to develop IT Enabled Services, as it has a large employment potential and a short gestation period. Its success mainly depends on the availability of trained manpower and quality infrastructure with adequate bandwidth and fault-free and uninterrupted power supply.

The state must formulate policies and provide a conducive environment to attract MNCs, to set up IT industry in Punjab, Special efforts have to be made to attract NRIs of Punjab origin actively involved in the IT Industry in USA and other developed countries.

The state needs to train 99,000 high quality manpower with the right mix of technical, business and functional skills, to achieve a five per cent share of the total IT Industry by 2007. (IT Services: 16,000, IT Software Product and Technology Services: 6,000 and IT Enabled Services: 77,000). Upgradation of the infrastructure of engineering colleges, including networking and the training of the faculty, is important to meet the required standards. An Indian Institute of Information Technology of international standard should be set up in Punjab to meet the requirements of quality manpower. It is recommended that a State Council for Computer and IT Education (SCCE), a body of experts responsible for monitoring and fixing minimum standards for quality IT education, both by government and private institutions, should be set up.

Punjab must ensure timely implementation of special norms for bandwidth during the Tenth Plan period, as recommended by the Government of India, to develop quality IT infrastructure. It is recommended that three new IT cities are developed at Patiala, Jalandhar and Ludhiana, besides upgrading the existing infrastructure at Mohali. Each such IT city should have a separate development authority on the pattern of Noida Development Authority and function independently. A fund of Rs. 30 crore may be allocated to create a venture capital fund during 2002-07.

Punjab should strengthen the Department of Information Technology (DoIT) in terms of expertise and funds, for promoting and implementing e-governance in the state. A monitoring cell, with defined rules and procedures, should be set up for monitoring performances of all the projects and departments against the set targets.

It is recommended that 140 Community Information Dissemination Centres (CIDCs) be set up, one in each block, linking all the villages on a state-wide network, for creating an IT culture and its usage among the masses. This will facilitate effective dissemination of information related to the 29 subjects transferred to panchayats under the 73rd Amendment Act. These centres will also function as IT kiosks, providing direct linkages between the masses and the government, and training to the panches, sarpanches and social workers. After initial investment, these centres should be financially self-sustaining.

In the Tenth Plan, Ministry of Information Technology has recommended three to five per cent of the plan outlay for the development of IT. The state has provided Rs. 110 crore, i.e., 0.47 per cent of the total outlay. It should be enhanced to a minimum of two per cent of the state's total Tenth Plan outlay.

Development Perspective and Strategy

Context

While enunciating a development perspective for Punjab, an essential prerequisite is to spell out the vision of Punjab – the kind of economy, society, polity, ecology and ideology envisaged for it, over a given period of time.

One can envision Punjab eventually as a region, which is sub-urban, displaying a continuum of rural and urban, agricultural and non-agricultural, with a hierarchy of settlements interlinked by a free-flowing transport network.

The popular development perspective seeks transformation of the state in the mould of a western country. An oft repeated self-question is: Why cannot Punjab be like the United States, or the United Kingdom, or like Israel, or Denmark among the smaller countries? However, Punjab has to construct its own model of development, based on the available natural resources, rich cultural heritage, quality of human capital, progressive agriculture, fairly advanced industry, and newly emerged opportunities in the field of information technology. The greatest asset of Punjab is the native genius, skill and work-culture of its people. Once all this is mobilized, the sky is the limit.

Punjab is an extrovert entity, actively interacting with areas all over the world. Its globalised psyche has to be taken care of as a valuable resource in any development perspective. Here poverty is not an issue; achieving a higher level of economic well-being is!

One specific feature of the development process in Punjab may be underlined: As soon as a new growth activity is initiated, it picks up momentum, and reaches a plateau rather too soon. The green revolution is one such case. Sustainability of the development process and providing new channels for its flow are now the crux of the matter.

On the whole, Punjab emerges as a grand success story. Evolved in the mode of a 'culture of competition', the state is taking time to acquire a 'culture of co-operation'. Human development is yet to reach the expected level. Succinctly put, Punjab has not been in a position to realize its potential fully.

Time Frame

What should be the time frame for the realization of the development perspective visualized for Punjab? In the medium-term, it could be placed at 1 November 2016, when Punjab would be celebrating the golden anniversary of its formation; in the short-term, it can be placed at 31 March 2007 when the Tenth Plan gets completed; and as a relatively long-term scenario, it can be dated as 31 December 2020, in the spirit of a new vision. These three datelines can adopt evolving development dimensions as their top priority: financial recovery as the necessary base (2007); human development (education and health) by 2016; and habitat (environment) by 2020.

Tasks

The main strands of any development strategy for Punjab include: rejuvenation of the socio-economic dynamism of the state; improvement in the quality of life as well of

habitat in both rural and urban areas; upgradation of the human resource base by improving the quality of educational and health services; diversification of the economy from agriculture to non-agriculture, of agriculture toward non-farm activities, and of wheat-rice rotation towards ecologically viable crop-combinations; and effective management of water and soil.

Additional issues pertinent to the development perspective can be listed as: How to make Punjab investment-friendly for industry? How should the state be meeting the challenges posed by the globalisation of the economy, labour-replacing new technologies, and over productive biotechnology? How to promote a culture of taking rational locational decisions, wherein economics leads politics rather than politics leading economics? An item not to be missed on any agenda of a development perspective for Punjab relates to raising the 'status of women'.

Currently, the state is organized into four divisions, 17 districts, 72 subdivisions, and 140 development blocks. A close scrutiny of the administrative map of Punjab shows some serious distortions in the organization of administrative space. A periodic administrative area reform, not on an ad hoc but a comprehensive basis, emerges as an essential task, for the sake of both administrative efficiency and development administration. In particular, there are some issues to deliberate. Should the state continue with its existing system of divisions, districts, subdivisions, or development blocks, or dispense with divisions and subdivisions and retain only districts and development blocks? What is the relevance of a division in a small state like Punjab? Do we need subdivisions when the average number of development blocks in a district is just eight?

There is still another moot point for deliberation. Should development blocks continue to remain exclusively rural, as they were originally designed, or should any town/s falling within their territorial jurisdiction be also included as a part of the block? The rationale of keeping rural and urban areas as separate in any scheme of things is difficult to justify in the present context.

As a development strategy, there is still another way of reforming the administrative areas. Let the boundaries of the state assembly constituencies and those of blocks correspond with each other, and likewise the boundaries of parliamentary constituencies should conform to those of higher-level administrative units, such as divisions or a group of districts.

In the final analysis, 'rejuvenation, quality, and management' emerge as the three key ingredients for reinventing Punjab today.

For years after independence, Punjab effectively demonstrated that it could lead in the mode of a model state in India. Today, it is craving to be led for the full realization of its potential in the making of a prosperous, just and civil society. The tide will turn only when leaders with foresight awaken the state from the slumber of its past glory and create a space for new dreams to manifest.

Chapter 1

PROFILE OF DEVELOPMENT AND CHANGE

Punjab is a classic example of a fast developing economy with agriculture at its foundation. It is credited for ushering in the green revolution in the country. A progressive mix of irrigation, fertilizers and high-yielding variety seeds laid the foundation; a process, which was further strengthened by agricultural credit societies, rural link roads, village electrification, and a variety of extension services. Punjab today contributes nearly 40 per cent of wheat and 60 per cent of rice procured for distribution through the public distribution system. The state also promoted the white revolution, resulting in the highest per capita availability of milk to the people. An agro-based and agro-oriented industrialization is another prominent feature of the state economy. No less commendable are the efforts to strengthen the infrastructure, particularly irrigation and power. The cumulative effect of all this is manifest in the highest per capita income of the state, a position of pride which Punjab has been holding for most of the years since its formation in 1966. A paradox may be stated here and explained: Despite its relatively high income level, the state is noted for considerable outmigration to other parts of India as also emigration to several countries, particularly the United Kingdom, Canada, United States, and Australia. This is attributed not to any distressful situation at home but to the attraction of greater prosperity outside.

Development in a state is the outcome of the interplay of a variety of factors, such as political, economic, demographic and geographic. Being a border state, both external and internal changes have influenced the path of development. In 1947, the state was partitioned. In 1966, it was trifurcated into Punjab, Haryana and Himachal Pradesh. The period of militancy, in the recent past, due to an internal crisis, had its own influence on shaping the development pattern of the state. Despite all this, it was able to achieve remarkable success in accomplishing reasonable conditions for a better standard of life. The present chapter is a profile of development and change in Punjab taking into account, the evolution of the state, its physical setting, infrastructure base, economic development, poverty, agricultural development, industrial development, and human development.

Punjab with an area of 50,362 square kilometres is one of the smaller states of India (Table 1). It accounts for 1.5 per cent of the total area of the country and 2.4 per cent of the total population (2001). It ranks 19th among all the states and union territories in terms of area, which is one-seventh of the largest state -- Rajasthan. With 2.4 per cent of the country's total population (2.43 crore) it ranks 15th in the country. Smallness of the state is reflected in the fact that its share in the total population of India is one-seventh of the most populous state - Uttar Pradesh. Punjab, with a density of 482 persons per square kilometres is the tenth most densely populated state in the country. (See district level details in Appendix 1).

Table 1
Status of Punjab on Selected Parameters in India, 1999-2001

States/Union Territories	Area (in sq. kms.)	Population [#]	Density [#] (persons per sq. kms.)	Urban Population [#] (in per cent)	Literate [#] (in per cent)	Per capita income ^{**} (Rupees)
India	32,87,263	102,70,15,247	324	27.78	65.38	10,067
States						
Andhra Pradesh	2,75,045	7,57,27,541	275	28.08	61.11	9,318
Arunachal Pradesh	83,743	10,91,117	13	20.41	54.74	9,170
Assam	78,438	2,66,38,407	340	12.72	64.28	5,978
Bihar	94,163	8,28,78,798	880	10.47	47.53	3,768
Chattisgarh	1,35,191	2,07,95,956	154	20.08	65.18	*
Goa	3,702	13,43,998	363	47.77	82.32	*
Gujarat	1,96,024	5,05,96,992	258	37.35	69.97	13,434
Haryana	44,212	2,1,082,989	477	29	68.59	13,709
Himachal Pradesh	55,673	60,77,248	109	9.79	77.13	9,177
Jammu and Kashmir	2,22,236	1,00,69,917	99	24.88	54.46	7,435
Jharkhand	79,714	2,69,09,428	338	22.25	54.13	*
Karnataka	1,91,791	5,27,33,958	275	33.98	67.04	10,928
Kerala	38,863	3,18,38,619	819	25.97	90.92	9,678
Madhya Pradesh	3,08,000	6,03,85,118	196	26.67	64.11	*
Maharashtra	3,07,713	9,67,52,247	314	42.4	77.27	15,410
Manipur	22,327	23,88,634	107	23.88	68.87	7,213
Meghalaya	22,429	23,06,069	103	19.63	63.31	7,826
Mizoram	20,987	8,91,058	42	49.5	88.49	*
Nagaland	16,579	19,88,636	120	17.74	67.11	*
Orissa	1,55,707	3,67,06,920	236	14.97	63.61	5,411
Punjab	50,362	2,42,89,296	482	33.95	69.95	14,678
Rajasthan	3,42,239	5,64,73,122	165	23.38	61.03	8,272
Sikkim	7,096	5,40,493	76	11.1	69.98	9,816
Tamil Nadu	1,30,058	6,21,10,839	478	43.86	73.47	12,504
Tripura	10,491	31,91,168	304	17.02	73.66	6,604
Uttar Pradesh	53,483	16,60,52,859	689	20.78	57.36	6,373
Uttaranchal	2,38,566	84,79,562	159	25.59	72.28	*
West Bengal	88,752	8,02,21,171	904	28.03	69.22	9,425
Union Territories						
Andaman and Nicobar Islands	8,249	3,56,265	43	32.67	81.18	*
Chandigarh	114	9,00,914	7903	89.78	81.76	*
Dadra and Nagar Haveli	491	2,20,451	449	22.89	60.03	*
Daman and Diu	112	1,58,059	1411	36.26	81.09	*
Delhi	1,483	1,37,82,976	9294	93.01	81.82	*
Lakshadweep	32	60,595	1894	44.47	87.52	*
Pondicherry	480	9,73,829	2029	66.57	81.49	*

Source: # - Census of India, 2001, Provisional Population Totals, Paper-1 of 2001, DCO, Punjab
 ## - Department of Planning, Economic and Statistical Organization, Statistical Abstract of Haryana, 2002, Government of Haryana
 * - Ministry of Information and Broadcasting (2002): India 2002, A Reference Annual, Publication Division, Government of India, New Delhi

The share of urban population to total population in the state is 34 per cent, the 12th highest in India. Seven out of every ten persons in the state are literate, and in terms of literacy it ranks 16th in the country.

EVOLUTION OF THE STATE

Historically, Punjab has experienced many upheavals and turmoils, which, in turn, have influenced its path of development. The administrative map of Punjab has undergone extraordinary changes in the past. The nomenclature 'Punjab' was widely used during the reign of Akbar (A.D. 1556-1605). It was known as the Kingdom of Lahore during the reign of Ranjit Singh (1799-1839). The British occupied it in 1849 and merged Delhi and the Hisar division of the former Northwest Province (now Uttar Pradesh) with Punjab in 1858. In 1901, Punjab's border districts situated across the Indus were taken away to form the Northwest Frontier Province. In 1912, Delhi territory was separated from Punjab.

At the time of the partition of the Indian sub-continent in 1947, Punjab was bifurcated into two parts: West Punjab (Pakistan) and East Punjab (India). Of its 3,59,179 square kilometres and 29 districts, only 1,52,649 square kilometres and 13 districts were left with Indian Punjab. The two Punjab's were partitioned on religious grounds. The most prosperous and developed western part went to Pakistan and the relatively backward eastern part remained in India.

In 1956, at the time of the reorganization of states on a linguistic basis, the former PEPSU territory was merged with Punjab. In 1966, the state was further reorganized under the Reorganization Act 1966. There was a strong demand for the reorganization of the state on a linguistic basis so that satisfaction of regional sentiments could be harmonized with the process of development. The Punjabi speaking areas were carved out of the erstwhile Punjab on 1 November 1966. The Hindi speaking areas in the north were merged with Himachal Pradesh. The southern Hindi speaking areas were constituted into a new state of Haryana. After the reorganization, Punjab became linguistically homogeneous and structurally compact. The Punjabi speaking state was created in 1966, with 11 districts, including Rupnagar. The reorganization reduced Punjab to about two-fifths the size attained after the merger of PEPSU in 1956. This was one-seventh the area of Punjab before Independence (Kant, S., 1988).

The state now is a linguistic unit inhabited by Punjabi speaking people. It had a population of 2.43 crore in 2001 distributed among 12,729 villages and 157 towns. Administratively, it is divided into 17 districts, 72 tahsils and 138 blocks. The city of Chandigarh (within the Chandigarh Union Territory) is the joint capital of Punjab and Haryana.

PHYSICAL SETTING

The word 'Punjab' consists of two Persian words: *Panj* (five) and *ab* (waters or rivers) which means the land of five rivers. Before partition, the state had five rivers, namely, the Sutlej, the Beas, the Ravi, the Chenab and the Jhelum. However, as a consequence of partition in 1947, Punjab lost the Chenab and the Jhelum. Although it no longer constituted the five rivers, the name of the state was not changed in the hope that the spirit, culture and language of the area would continue and flourish. The three rivers -- Ravi, Beas and Sutlej -- have proved to be useful for generating electricity and irrigation.

Location: Before Independence, Punjab was spread between 27°39' and 34°02' N latitude and 69°23' and 79°52' E longitude. The present Punjab, triangular in shape, extends from 29°30' to 32°32' N latitude and 73°55' to 67°50' E longitude. It covers an area of 19,445 square miles (50,362 square kilometres).

Punjab is located in the northwestern part of the subcontinent. Bordering Pakistan on its west, Punjab occupies a position of great strategic importance. It is bounded on the north by Jammu and Kashmir, Himachal Pradesh on the northeast and east, and Haryana on the southeast and south, and Rajasthan on the southwest.

Physiography: Punjab does not have any large-scale diversity in its physiography. The state has a more or less physical homogeneity with the exception of scattered and low ranges of the Sivaliks in the north and northeast. Physiographically, the state may be divided into three regions:

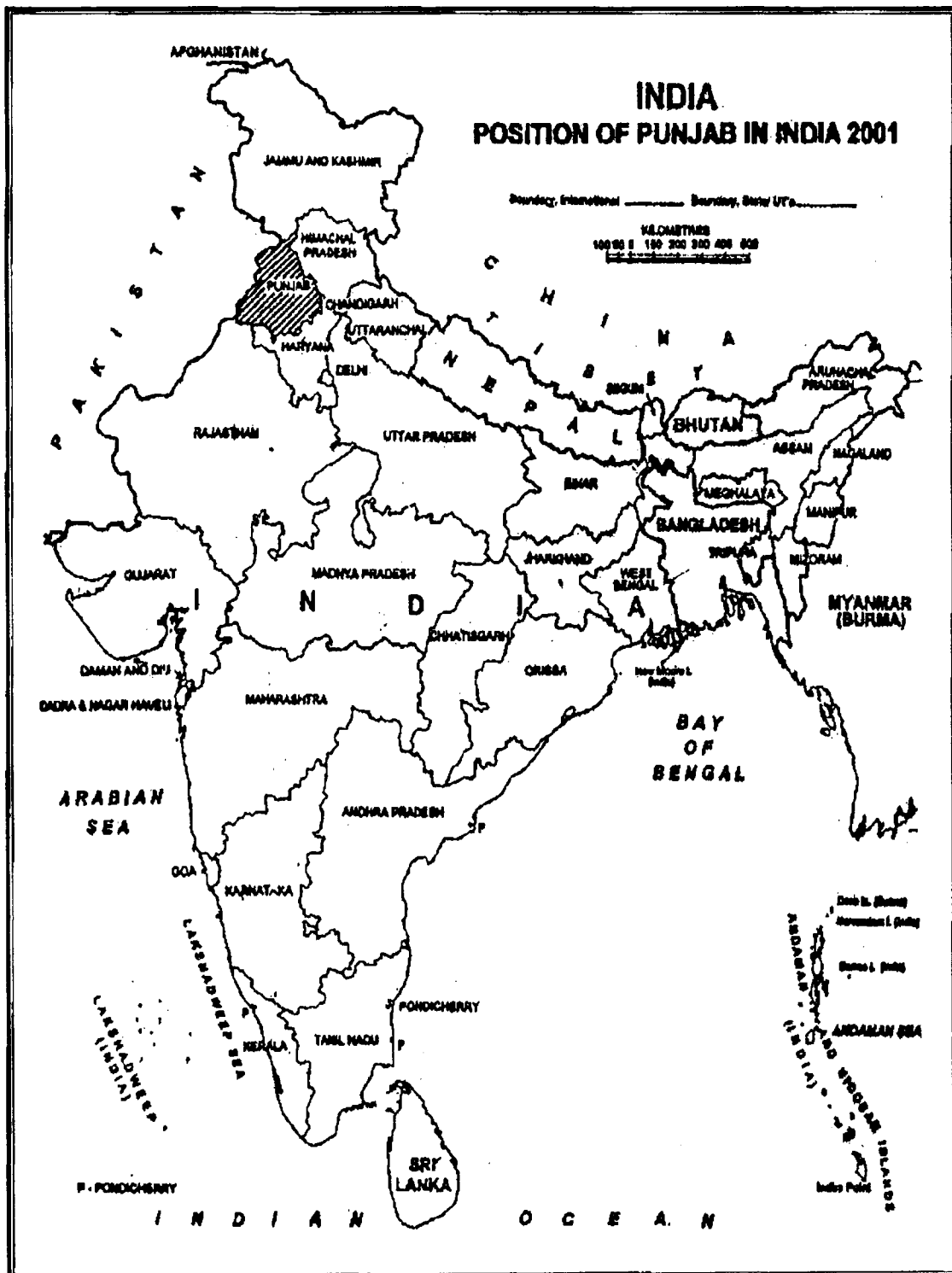
- i) Hilly tract
- ii) Foothills, and
- iii) Flat plains.

The hilly tract, forming part of the Siwalik hills, extends along the north and northeastern border of the state. The foothill plains are located between the hilly tract and the flat plains in the north and northeastern parts of the state. The major part of the state's physiography is dominated by flat plains. These plains are the result of the alluvium deposits of rivers, and are very fertile. A significant portion of Punjab is the flat plain gently sloping from about 275 metres in the northeast to about 170 metres in the southwest. Punjab surpasses all other states of India in possessing a large level topography. The flat physiography of the state has proved beneficial for laying roads and creating infrastructure at a low cost, which is very difficult in hilly tracts. Higher accessibility to services and the strong linkage between rural and urban areas are partly due to the flat physiography.

Forest: The area under forests is quite insignificant in the state. Accordingly to the National Forest Policy 1982, a minimum 33 per cent of the total geographical area should be under forest. The forest cover in the state is 6.05 per cent of its total area, as against the national average of 19.4 per cent.

Climate: Punjab has an inland subtropical location. Its climate is continental, semi-arid to sub-humid. More than 70 per cent of the annual rainfall is concentrated in the monsoon months of July to September. Winter rains occur in the December and January. The southwestern part of Punjab receives low annual rainfall. January and June have the lowest and highest temperatures respectively.

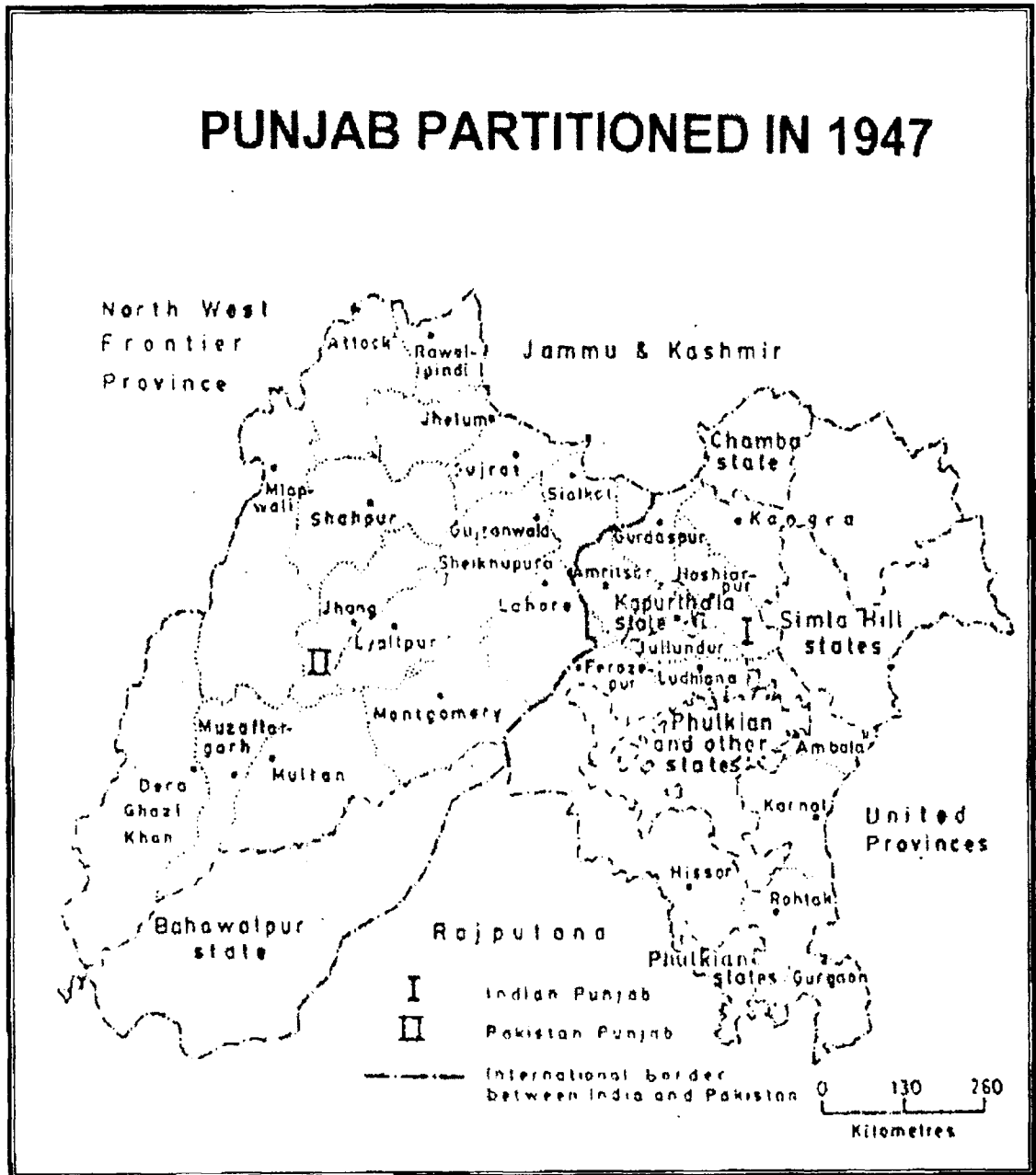
Soil: Soils in the state are generally sandy loam to loam in texture, which are deficient in nitrogen and organic matter and, therefore, need heavy manuring for good yields.



Map 1

Source: *Census of India (2001), Provisional Population Totals, Paper -2 of 2001, DCO, Punjab*

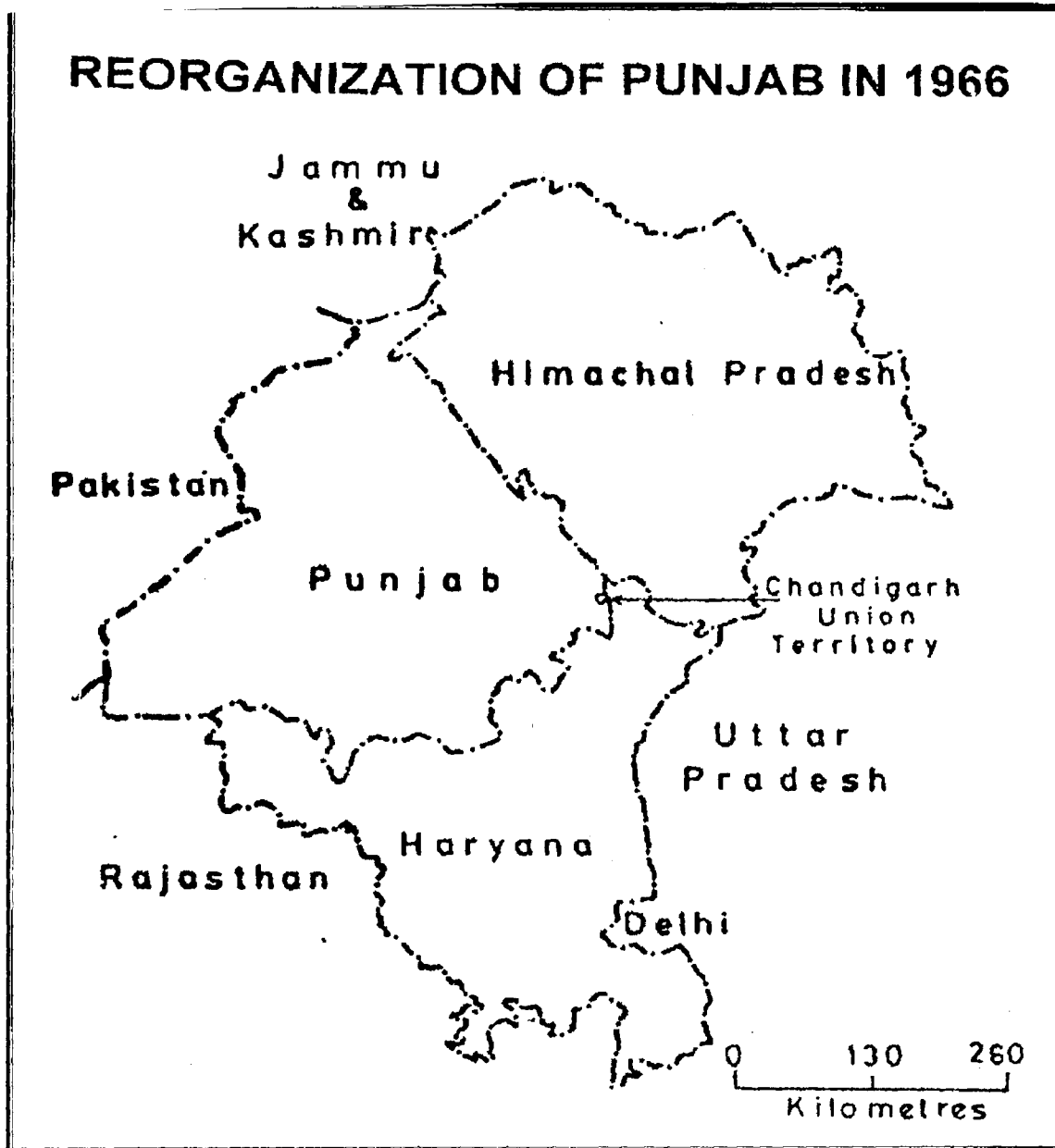
PUNJAB PARTITIONED IN 1947



Map 2

Source : Surya Kant (1988), *Administrative Geography of India*, Rawat Publishers, Jaipur

REORGANIZATION OF PUNJAB IN 1966



Map 3

Source : Same as in Figure 2

PUNJAB ADMINISTRATIVE DIVISIONS 2001



Map 4

Source: Census of India (2001), Provisional Population Totals, Paper-2 of 2001, DCO, Punjab

However, the weak point of Punjab's physiography is the deteriorating soil health, change in the water table, and lack of availability of minerals and fossil-fuel resources. Due to the practice of rice-wheat rotation and excessive use of fertilizers over a long period, the soil has lost its character. It requires heavy doses of fertilizers, which

amounts to an additional financial burden on the farming community in terms of the inputs in the agricultural sector in the state.

Water bodies: The rivers -- the Ravi, the Beas and the Sutlej -- are perennial streams. All-time availability of water is the major requirement of the state. To cope with the shortage of water, which fluctuates from one season to another, dams and barrages were constructed for regulating the water supply needed to feed irrigation and powerhouses throughout the year. The state has developed a good network of canals.

Overall, the physical setting of the state makes it conducive for agricultural development. Punjab has a physiography, which has provided an opportunity for the mechanization of agriculture. This has further helped in achieving rapid strides in agricultural production. Its location on a generally hostile international border since partition, has had its own impact on the development process in the state.

INFRASTRUCTURAL BASE

The task, after partition and the reorganization, was to give a direction to the development process of the state, to respond positively to the aspirations and development needs of the people. The vision of the state government, after partition, centred on the initiation of the right kind of priorities. This was in accord with the specific economic infrastructural strength of the state as well as the needs of the overall national economy. The objective was to boost economic development through the rural development. It was to be achieved through agricultural development, rural electrification, and road connectivity. The success in creating this particular infrastructure in the state can be judged from the fact that its rating by the Centre for Monitoring Indian Economy is 191.4 as against the national average of 100.

Rehabilitation: Post-partition Punjab was faced with the lack of the infrastructure necessary to accommodate 40 lakh displaced persons. They were put in refugee camps, institutions and other available structures in insanitary conditions. The immediate task was to create the infrastructure to accommodate the refugee population. New towns were constructed and economic projects initiated for the resettlement of refugees from rural areas. The developmental pattern, established during the period, has continued to guide the path of development in the state till today.

Another major problem after independence was the need for a suitable site for a new capital, since Lahore had been lost to Pakistan. Shimla, the summer capital of British India, was adopted as an interim arrangement. Because of the peripheral location of Shimla, it was decided to build a new capital, to be called Chandigarh, which was centrally located in relation to the territory of Punjab after independence. The capital was shifted from Shimla to Chandigarh in 1953. However, after the reorganization of the state, the capital has again moved towards the periphery. Punjab and Haryana have conflicting claims on Chandigarh. Unable to secure exclusive right to Chandigarh, the two states have established new towns, namely Mohali in Punjab and Panchkula in Haryana, on the periphery of Chandigarh. This has influenced the developmental pattern of the state. Most of the developmental activities are around these towns.

Partition changed not only the overall demography of the area but also the religious composition of the population. Prior to partition, the Hindus, the Muslims and the Sikhs had first, second and third rank in most parts of the state. With the mass exodus of

Muslims to Pakistan on the eve of partition, Punjab became a Hindu majority area, and after reorganization, as constituted now, a Sikh majority area. The three major religious communities possess different skills, which in turn have influenced the subsequent development of the state. The farming community in western Punjab was more skilled than in eastern Punjab. In-migration of these communities to eastern Punjab gave a boost to the agricultural sector.

Before reorganization, the major part of infrastructural development had been allocated to the relatively more populous and developed areas of Punjab (Table 2).

Table 2
Comparative Picture of Social Infrastructure and Demographic Attributes in Punjab and Haryana at the Time of Reorganization and in 2000-01

Facility/attribute	1961-1975		2000-2001	
	Punjab	Haryana	Punjab	Haryana
High/Higher secondary schools per 1,000 sq. kms.	19.56 (1965-66)	11.22 (1965-66)	67.3 (2000-2001)	88.6 (1999-2000)
Road length (mettalled) per 100 sq. kms.	12.65 (1965)	11.95 (1965)	91.2 (2000-2001)	54.8 (1999-2000)
Per cent of electrified villages	29.41 (1966)	18.59 (1966)	100.0 (2000-2001)	100.0 (1999-2000)
Birth rate	34 (1971-73)	41 (1971-73)	22.4 (1997-99)	27.6 (1997-99)
Death rate	11.7 (1971-73)	11.3 (1971-73)	7.5 (1997-99)	8.0 (1997-99)
Infant mortality rate	112 (1971-73)	90 (1971-73)	52.7 (1997-99)	68.7 (1997-99)
Life expectancy	57.9 (1970-75)	57.5 (1970-75)	67.4 (1992-96)	63.8 (1992-96)
Sex ratio [#]	865 (1971)	867 (1971)	882 (2001)	865 (2001)
Per cent literates [#]	26.74 (1961)	19.90 (1961)	69.9 (2001)	68.6 (2001)
Per cent urban population [#]	23.06 (1961)	17.20 (1961)	33.9 (2001)	29.0 (2001)

- Source:**
- i) Various issues of *Statistical Abstracts of Haryana and Punjab*
 - ii) * Registrar General (1999): *Compendium of India's Fertility and Mortality Indicators, 1971-97*, Sample Registration System, India, New Delhi
 - iii) ** Registrar General (2001): *Sample Registration System Bulletin*, Volume 35, No. 2, October 2001, New Delhi.
 - iv) # *Census of India*, Volumes 1981 and 2001

Irrigation: Efforts were made to bring more area under cultivation. Initially, the completion of the Bhakhra-Nangal project and subsequently sinking of tube wells met the major requirements of water in the state. In 1970-71, it had 71 per cent of the net irrigated area to net area sown, which increased to 94 per cent in 2000-01.

Transport and communication: The state has developed a good network of roads. The economy took a new turn with the construction of rural roads in the state. During 1970-71 to 2000-01, road network increased 3.3 times. Almost all (99.24%) villages are connected by roads. In Kapurthala, Jalandhar, Nawanshaher, Faridkot, Mukatsar, Moga, Mansa and Fatehgarh Sahib districts all villages are connected by roads.

Power: Since its formation, the state has been making every effort to augment its energy resources. By 1975-76, it achieved 100 per cent electrification of all its villages. All the villages are connected to a grid. In 1980-81, 56.33 per cent of the total households were using electricity, which increased to 86.70 per cent in 2000-01. The per capita generation of power (733 kwh) is 2.5 times the national average. Per capita consumption of electricity in the state in 1998-99 was 351.39 kwh as against the national average of 90.98 kwh, and 232.80 kwh in the neighbouring state of Haryana. Approximately two-fifths (39.3%) of the electricity produced in the state in 1999-00 went to the agricultural sector. This share is one of the largest in any state in the country.

Institutional credit: The state has a strong infrastructure for providing credit through a multi-tier and multi-functional system. It has the highest number of banks per capita -- 15 banks for every 10,000 population. Institutions providing ready credits in the state increased initially at a faster pace but slowed down gradually. The increase was relatively sharper during 1966 to 1970, when the number of banks per 10,000 rural population increased sharply from 97 to 326. The increasing income of the farmers and the consequent increase in the saving capacity has promoted an improved credit system in rural areas (Singh, H., 2001). In 1990, 55.1 per cent of the banks were located in the smaller areas as against 51.5 per cent in 1980. However, in the post-liberalization period, the situation has changed. Banking facilities are moving towards urban areas. Banks in urban areas increased from 22.6 per cent in 1990 to 30.5 per cent in 2000. On the other hand, banks in smaller areas decreased from 55.5 per cent to 43.2 per cent during the same period.

Besides this, the co-operative societies have made a significant contribution to stimulating the rural economy of the state. Their membership has almost doubled during the 1970-71 to 2000-2001, i.e., from 22 lakh to 44 lakh.

Urban base: One-third of the total population in the state is urban, living in 157 towns. One out of every seven persons in urban areas reside in slums. The existence of urban slums indicates pressure on the urban infrastructure. Urbanization in the state is expected to increase at a rapid pace due to economic reforms and industrial growth. This would put great stress on the urban infrastructure. Despite efforts of the government in containing the number of slum dwellers, the slums are expanding and the situation is worsening with the passage of time.

Education: Infrastructure for social upliftment in the state has increased significantly. The teacher-pupil ratio was 1:42 at the primary level, 1:26 at the middle level and 1:24 at the high/senior stage in 2000 in the state as against 1:42, 1:37 and 1:35 respectively at the national level. However, despite improvements in infrastructural facilities, there has been no change in the teacher-pupil ratio in primary schools during the period 1971 to 2000. The teacher-pupil ratio in primary schools in Mukatsar and Mansa districts was 1:55 and 1:60 respectively, indicating a disparity in availability of teachers.

In 1971, only two engineering, technology and architecture colleges were in operation as against 16 in 2000. During the same period, polytechnic institutes have increased from eight to 20 and technical, industrial and craft schools from 27 to 119. This kind of infrastructure has led to a change in the employment scenario of the state. Of the total 5.49 lakh unemployed (September 2001), three-fourths are educated unemployed. Out of them, unemployed, 77.63 per cent belong to the non-technical category and the

remaining 22.37 per cent have professional qualifications. This is an indication to policy makers to plan the requisite type of educational infrastructure.

Health: The health infrastructure in the state has expanded sharply in rural areas. In 2000-2001, four-fifths of the health institutions were in rural areas as against 57.9 per cent in 1970-71. During 1970-71 to 2000-01, health institutions in rural areas increased 5.7 times as against two times in urban areas. However, the quality of the health infrastructure available in urban areas is better than in rural areas. During this period, of the total health institutions in rural areas, 4.1 per cent were functioning as hospitals as against 29.6 per cent in urban areas. The majority of the health institutions (68.5%) in the state catered to the primary health care needs of the rural community.

ECONOMIC DEVELOPMENT

The resource base determines the direction and pace of economic development. Predominance of the agricultural sector characterized the economy of Punjab. Its base was already there when the state was first formed and further developed in a planned manner. Agriculture has been the backbone of the state economy. Even though the share of the agricultural sector has declined, two-fifths of the state domestic product still comes from this sector alone. It had boosted economic growth initially, but seems to have slowed down over the years. The state's economy, after years of prosperity has been experiencing a declining trend in recent times.

State domestic product: The state's economic performance has varied over different time periods. During 1965-66 to 1975-76, the economy grew at the rate of 4.8 per cent as against 3.5 per cent in the national economy (Department of Planning, 1978). Thereafter, the state economy grew at a pace slower than the other states as well as the Indian economy. In the 1980s, Punjab economy grew at the rate of 5.3 per cent per annum as against 5.5 per cent in the case of the national economy (Table 3). Such States Rajasthan (6.6%), Haryana (6.4%), Maharashtra (6.0%) and Andhra Pradesh (5.6%) experienced higher rates of growth than Punjab. States, such as Tamil Nadu (5.4%), Karnataka (5.3%) and Gujarat (5.1%) experienced a more or less similar rise in their respective economies. The state economy has grown at a relatively slower rate in the post-liberalization decade of the 1990s. During 1991-92 to 1997-98, the national economy grew at the rate of 6.9 per cent per annum as against 4.71 per cent in the case of the state economy. This was the time when the economy of other states grew at an even faster rate than in the 1980s. The economy of Gujarat, Maharashtra, West Bengal, Tamil Nadu, Madhya Pradesh and Kerala grew at the rate of 9.6, 8.0, 6.9, 6.2, 6.2, 5.8 per cent per annum respectively. The neighbouring state of Haryana grew at the rate of 5.0 per cent per annum.

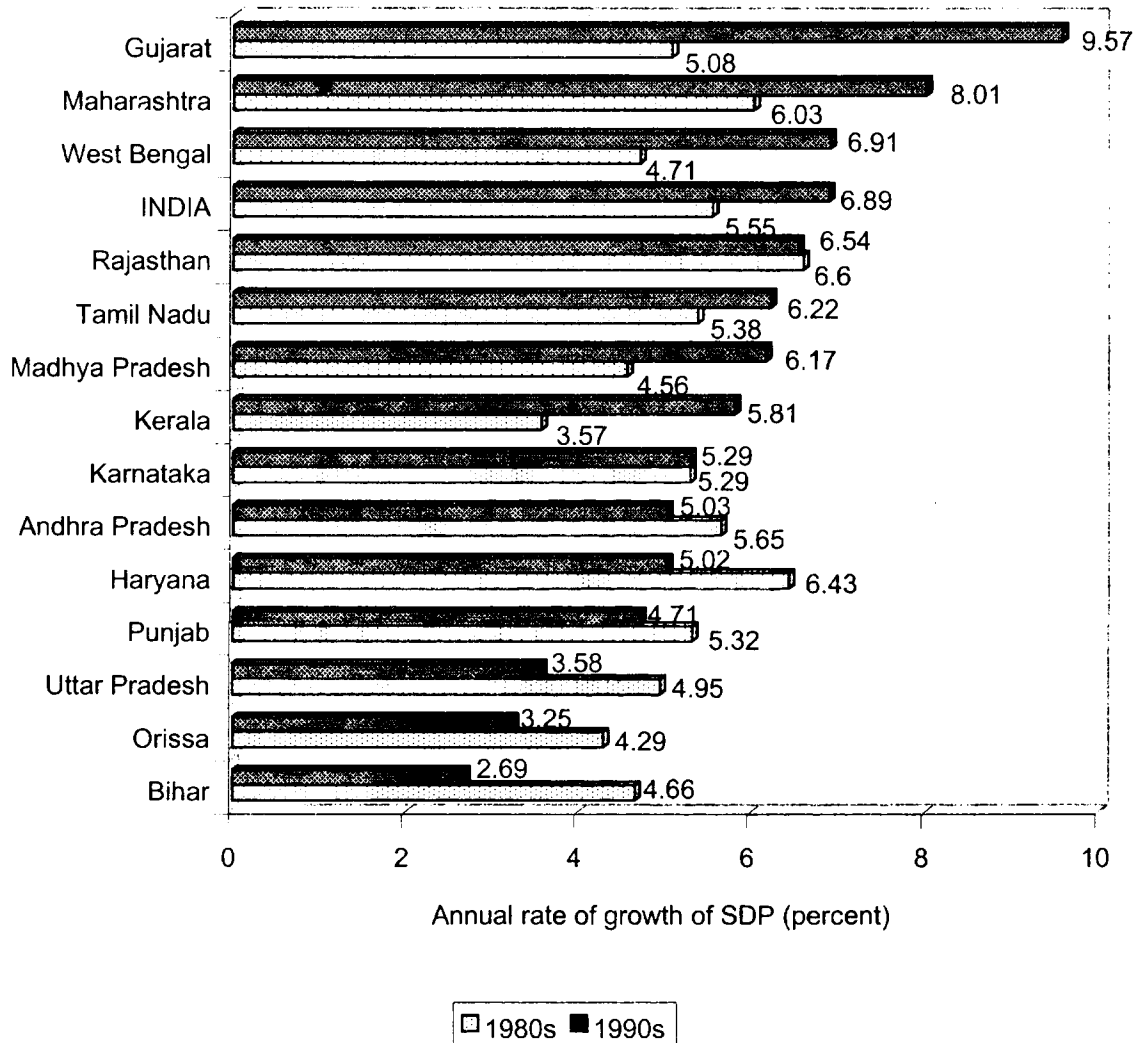
Table 3
Economic Performance of States during the 1980s and 1990s

State	Annual rate of growth of GDP (per cent)		Annual rate of growth of per capita GDP (per cent)	
	1980-81 to 1990-91	1991-92 to 1997-98	1980-81 to 1990-91	1991-92 to 1997-98
Bihar	4.66	2.69	2.45	1.12
Rajasthan	6.60	6.54	3.96	3.96
Uttar Pradesh	4.95	3.58	2.6	1.24
Orissa	4.29	3.25	2.38	1.64
Madhya Pradesh	4.56	6.17	2.08	3.87
Andhra Pradesh	5.65	5.03	3.34	3.45
Tamil Nadu	5.38	6.22	3.87	4.95
Kerala	3.57	5.81	2.19	4.52
Karnataka	5.29	5.29	3.28	3.45
West Bengal	4.71	6.91	2.39	5.04
Gujarat	5.08	9.57	3.08	7.57
Haryana	6.43	5.02	3.86	2.66
Maharashtra	6.03	8.01	3.58	6.13
Punjab	5.32	4.71	3.33	2.8
SDP of 14 states	5.24	5.94	3.03	4.02
GDP (National accounts)	5.55	6.89		

Source: Ahluwalia, M.S. (2000) 'Economic Performance of States in Post-Reform Period', *Economic and Political Weekly*, 35(19), 6 May.

Figure 1

Economic Performance of States during the 1980s and 1990s



Source: Same as in Table 3

Per capita income: Since its formation in 1966, the state has been ranked first in terms of per capita income. However, after the introduction of economic reforms in the 1990s, it lost that place. The growth of per capita income in other states was steadier than in Punjab. During the 1980s, the difference in the rate of growth of per capita income between Punjab, Maharashtra and Gujarat was not so wide (3.3, 3.6 and 3.1 % respectively per annum) as compared to the 1990s. During the 1990s, the rate of growth of the per capita income in Gujarat and Maharashtra was 7.6 and 6.1 per cent per annum respectively as against 2.8 per cent in Punjab. This calls for an in-depth analysis.

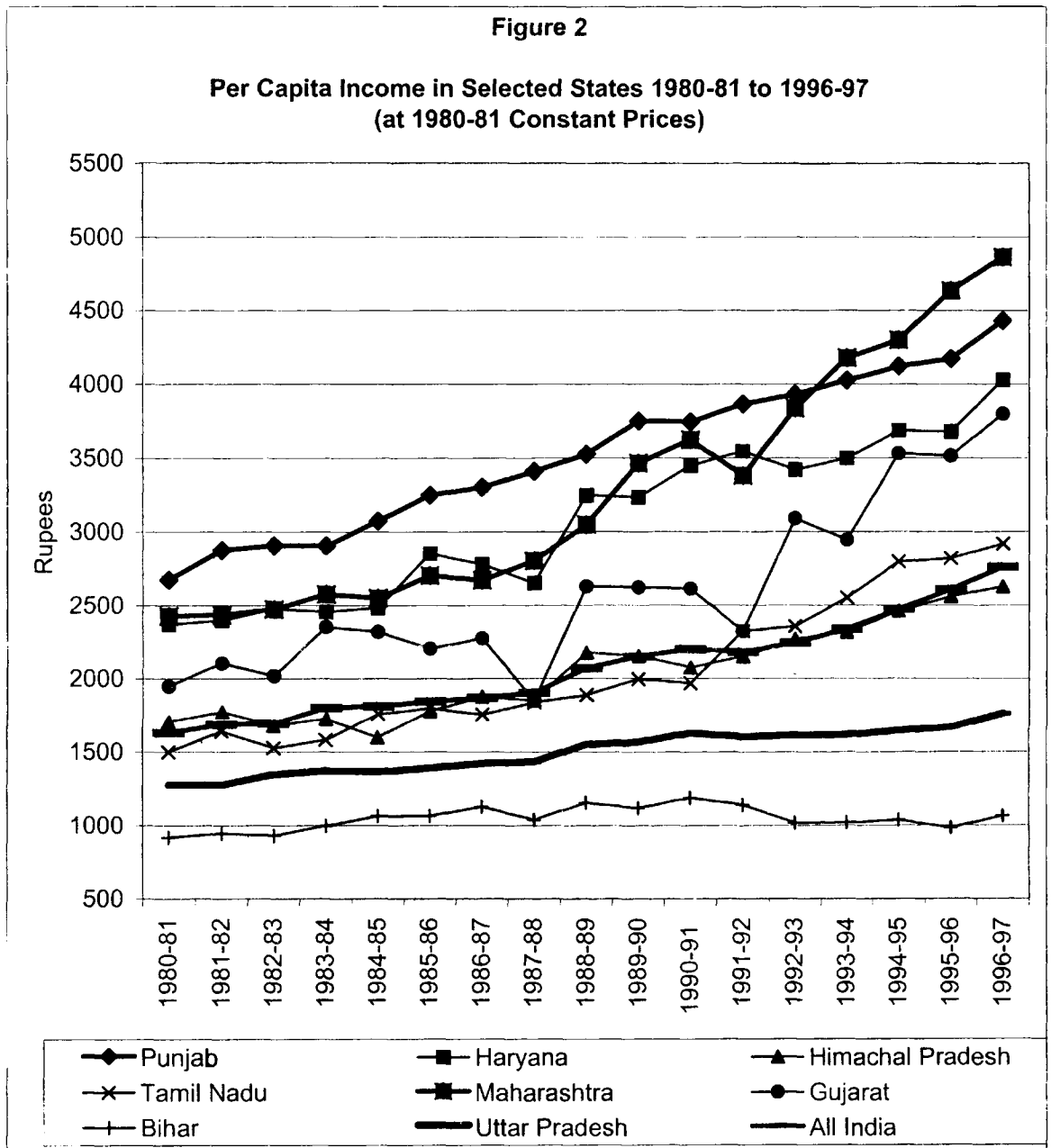
Per capita income in the state rose continuously during 1966-67 to 2000-01 at current prices. This reflects the rising level of prosperity in the state. Even at constant prices, with the base year 1980-81, the trend reveals that it was only thrice, in the last 32 years, that the per capita income decreased as compared to the preceding year (Table 4). As compared to the per capita income of Rs. 2,094 in 1969-70, in 1970-71 it came down marginally to 2,092, a fall of Rs. 2; from Rs. 2,646 in 1978-79 to Rs. 2,612 in 1979-80 and from Rs. 2,906 in 1982-83 to Rs. 2,904 in 1983-84. However, the per capita income in some years rose at a faster pace than in the preceding year. In 1981-82, 1989-90 and 1996-97 the per capita income increased by Rs. 201, 224 and 258 respectively as compared to the preceding year.

Table 4
Per Capita Income in Punjab during 1966-67 to 2000-01 at 1980-81 Constant Prices

Year	Per capita income (Rupees)	Year	Per capita income (Rupees)
1966-67	1,791	1984-85	3,073
1967-68	1,957	1985-86	3,249
1968-69	2,024	1986-87	3,302
1969-70	2,094	1987-88	3,410
1970-71	2,092	1988-89	3,526
1971-72	2,109	1989-90	3,750
1972-73	2,133	1990-91	3,751
1973-74	2,142	1991-92	3,865
1974-75	2,157	1992-93	3,931
1975-76	2,295	1993-94	4,025
1976-77	2,388	1994-95	4,120
1977-78	2,527	1995-96	4,172
1978-79	2,646	1996-97	4,430
1979-80	2,612	1997-98	4,452
1980-81	2,674	1998-99	4,627
1981-82	2,875	1999-00	4,794
1982-83	2,906	2000-01	4,925
1983-84	2,904		

Source: Various issues of *Statistical Abstracts*, Punjab

Even though Punjab's rank in per capita income has gone down in comparison with other states, it remains one of the highest. Per capita income in the state in 1997-98 was 4.1 times higher than in Bihar, which was 2.9 times higher in 1980-81. In fact, the per capita income of the state was the highest among the major states up to 1993-94, when Maharashtra surpassed Punjab. During this period, the per capita income the state was Rs 4,025 in comparison with Rs. 4,177 in Maharashtra. The gap in the per capita income between these two states has widened ever since. The per capita income of Punjab in 1997-98 was Rs. 4,452 as compared to Rs. 4,791 in Maharashtra.



Source: Various issues of *Statistical Abstracts*, Punjab

Structural transformation of the economy: Despite deceleration of the overall state economy, it has undergone a structural transformation during the last three decades, 1970-71 to 1998-99. The primary sector grew at the rate of 3.9 per cent per annum as against the secondary sector at 6.5 per cent and the tertiary sector at 5.4 per cent (Table 5).

The sectors which have grown at a rate less than the state average are trade, hotel and restaurants (4.9%), agriculture and livestock (3.9%), other services (3.3%), agriculture (3.2%), forestry and logging (2.8%), real estate ownership of dwellings and business

services (2.3%), construction (1.6%), and mining and quarrying (-4.9%). The sectors experiencing a rate of growth higher than the state average were fishing (12.5%), banking and commerce (9.7%), electricity, gas and water supply (9.4%), manufacturing (8.6%), public administration (8.0%), transportation storage and communication (7.6%) and livestock (5.3%).

Table 5
Sectoral Rates of Growth in Punjab, 1970-71 to 1998-99 at 1980-81 Constant Prices

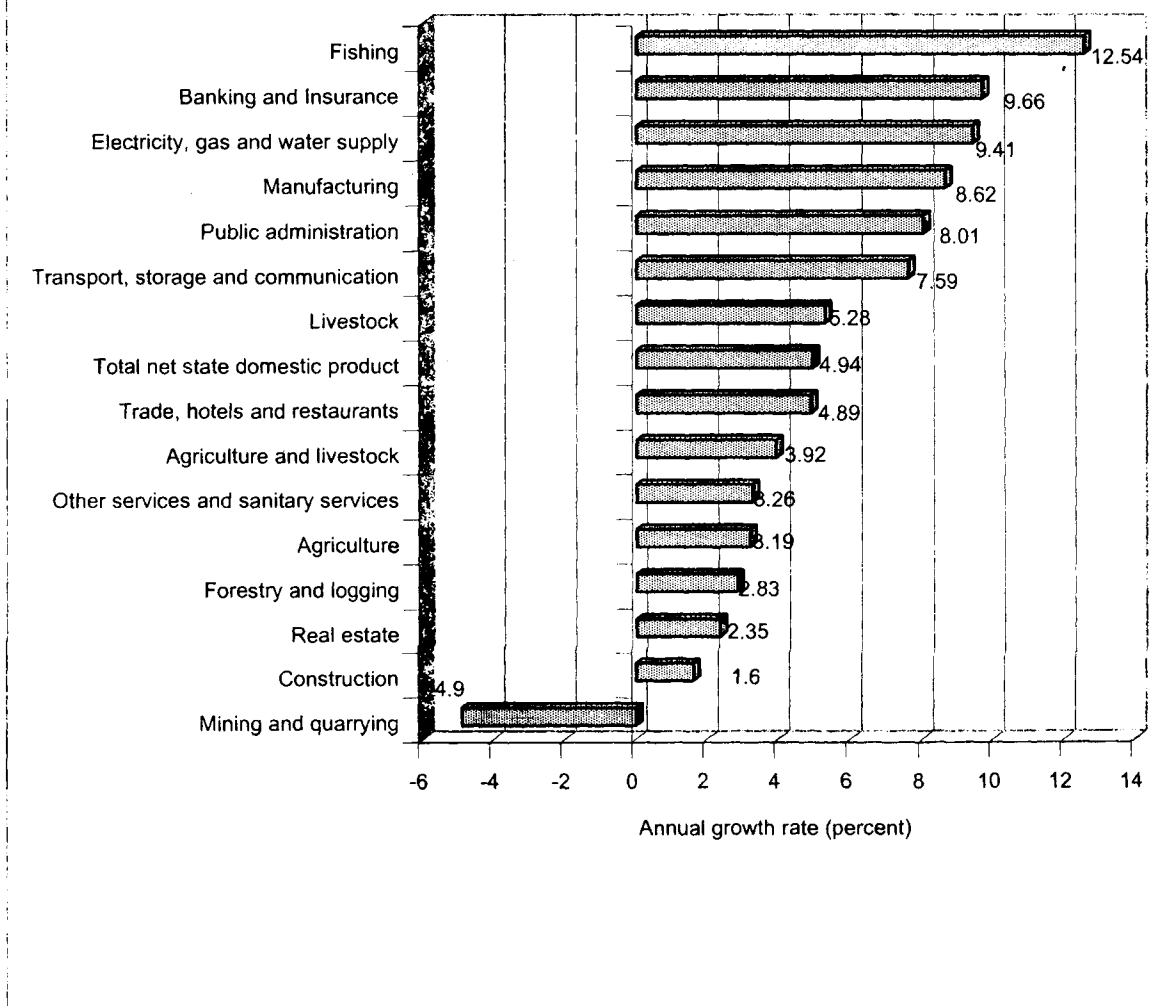
Sector	1970-74	1974-78	1980-85	1985-90	1992-97	1997-99	1970-71 to 1998-1999
(A) Primary							
Agriculture and livestock	1.42	3.93	4.96	3.96	2.66	1.76	3.92
<i>Agriculture</i>	0.56	2.20	5.65	3.58	1.73	2.53	3.19
<i>Livestock</i>	1.40	2.30	3.53	4.76	4.27	0.72	5.28
Forestry and logging	2.05	8.21	-16.43	-1.09	0.24	0.30	2.83
Fishing	0.29	2.57	2.28	16.88	15.15	11.17	12.54
Mining and quarrying	-19.18	4.20	-3.04	35.79	-36.63	-3.82	-4.90
Total (A)	0.81	2.30	4.66	3.91	2.66	1.80	3.93
(B) Secondary							
Manufacturing	3.48	5.40	8.36	6.66	7.16	3.53	8.62
Electricity, gas and water supply	3.88	6.30	5.36	9.99	4.96	3.36	9.41
Construction	-0.85	5.01	-2.75	0.88	2.29	3.55	1.60
Total (B)	1.44	5.28	4.93	5.75	6.25	3.52	6.52
(C) Tertiary							
Trade, hotels and restaurants	2.77	5.20	2.38	2.75	2.96	2.37	4.89
Transport, storage and communication	2.56	2.71	5.28	5.67	9.92	7.92	7.59
Banking and Insurance	1.60	5.92	9.12	11.76	8.90	6.94	9.66
Real estate, ownership of dwellings and business services	0.47	0.49	1.46	2.65	-0.40	1.11	2.35
Public administration	1.34	2.35	2.14	9.14	4.53	5.09	8.01
Other services and sanitary services	2.13	2.47	2.00	1.72	1.80	1.40	3.26
Total (C)	2.06	3.64	2.97	4.46	4.24	3.97	5.42
Total net state domestic product	1.27	3.23	4.18	4.45	3.98	2.92	4.94
Per capita Net State product (Per Capita Net Income) Rs.	0.34	2.29	2.40	2.93	2.42	1.95	2.88

Source: Various issues of *Statistical Abstracts*, Punjab

Note: The data presented in the table marks the seventies and latest year, and the last year of the respective plan periods beginning from Fourth Plan

Figure 3

**Sectoral Rates of Growth in Punjab 1970-71 to 1998-99
(at 1980-81 constant prices)**



Source: Various issues of *Statistical Abstracts*, Punjab

Agriculture is still a major contributor to the state economy, despite its continuously declining share. Its share in SDP declined from 52.85 per cent in 1966-67 to 41.33 per cent (Table 6) in 1998-99 (at 1980-81 base year). The share of the agricultural sector in SDP up to the end of the Seventh Plan (1989-90) decreased by 3.7 per cent points as compared to its contribution up to the end of Fourth Plan period. It decreased at a faster rate during the Eighth Plan than during Seventh Plan. During this period, its share decreased by 4.2 points. The share of agriculture in SDP per se drastically declined from 40.91 per cent to 24.08 per cent during 1966-67 to 1998-99, a fall of 16.83 per cent points. The share of the livestock sector increased by 6.54 per cent points during the same period. Forestry and logging, fishing, and mining and quarrying sectors continue to contribute a negligible share to the state economy. This structural shift in the agricultural sector is a sign of the state's healthy economy.

Table 6
Sectoral Distribution of SDP of Punjab during 1966-67 to 1998-99 at 1980-81 Prices
(in per cent)

Sector	1966-67	1973-74	1977-78	1984-85	1989-90	1996-97	1998-99
Agriculture and livestock	52.85	52.57	50.30	50.28	49.15	44.95	41.33
<i>Agriculture</i>	40.91	36.66	34.85	34.54	32.96	27.68	24.08
<i>Livestock</i>	10.71	15.90	15.45	15.74	16.19	17.27	17.25
Forestry and logging	0.38	0.81	0.80	0.33	0.6	0.46	0.44
Fishing	0.04	0.03	0.03	0.03	0.06	0.19	0.24
Mining and quarrying	0.01	0.01	0.01	0.01	0.04	0	0
Manufacturing	7.86	9.36	10.67	13.4	15.55	20.07	21.1
Electricity, gas and water supply	0.71	1.00	0.96	1.39	1.96	2.61	2.69
Construction	3.5	7.94	8.38	4.36	3.77	3.21	3.73
Trade, hotels and restaurants	10.96	12.15	13.75	13.36	11.49	10.7	10.82
Transport, storage and communication	1.45	1.89	1.88	2.16	2.3	2.89	3.47
Banking and Insurance	1.43	1.84	1.98	3.21	4.28	5.38	6.17
Real estate, ownership of dwellings and business services	5.78	4.53	3.69	3.73	3.43	2.47	2.38
Public administration	1.52	1.79	1.63	2.55	3.09	3.38	3.99
Other services and sanitary services	6.13	6.07	5.92	5.19	4.28	3.69	3.64

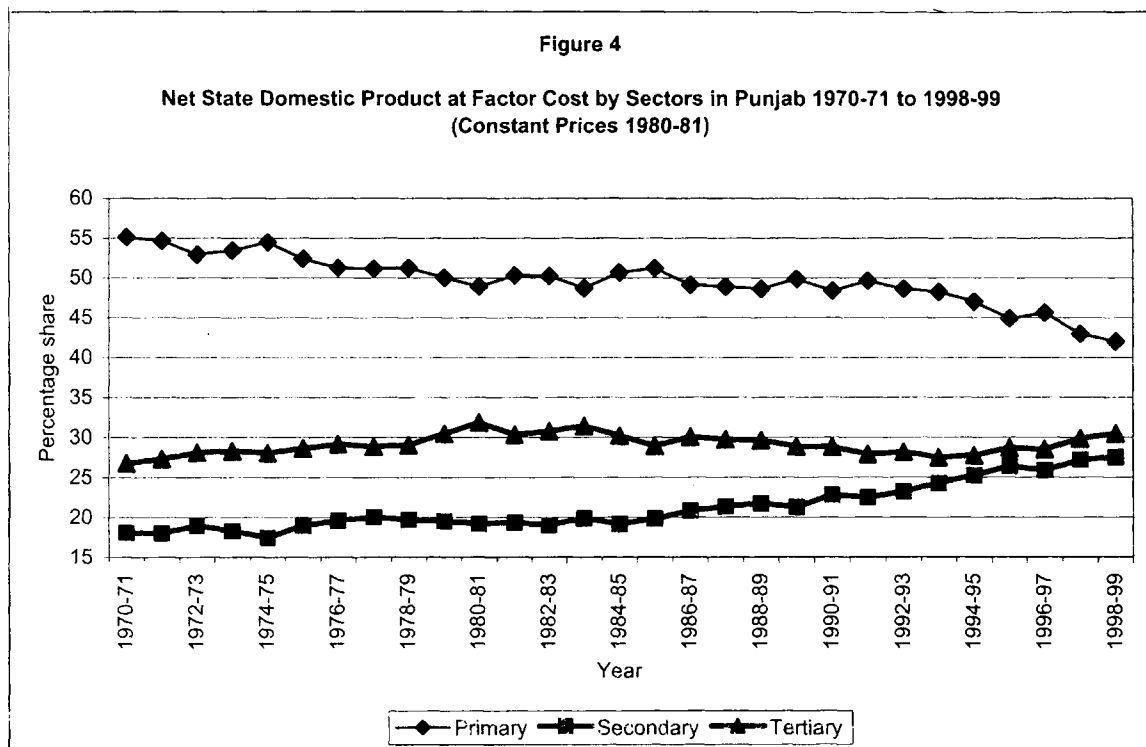
Source: Various issues of *Statistical Abstracts*, Punjab

Note : The data presented in the table marks the beginning year of the state and latest year, and the last years of the respective plan periods beginning from Fourth Plan

During 1966-67 to 1998-99, the share of the manufacturing sector in SDP increased by 13.2 per cent points. During the 1990s, its rise was higher than during the 1970s and 1980s. This increase has continued consistently in all the plan periods. It increased by 2.1 per cent points between the Sixth and the Seventh Plans and by 4.5 per cent points during the Seventh and Eighth Plans. There has been hardly any increase in the first two years of the Ninth Plan.

The share of the construction sector in SDP has remained more or less the same during 1966-67 to 1998-99. On the other hand, the share of electricity, gas and water supply sectors have increased by 1.98 per cent points during the same period. However, as compared to the end of the Fourth Plan their share rose by 1.6 per cent points by the end of the Eighth Plan. The first two years of the Ninth Plan indicate a continuation of this trend.

The share of trade, hotel and restaurants sectors has marginally decreased during 1966-67 to 1998-99. Their performance, however, has varied during different plan periods. At the end of the Fourth Plan it was 12.1 per cent, increased to 13.7 per cent at the end of the Fifth Plan, and thereafter, it started declining, reaching 10.7 per cent by the end of the Eighth Plan.



Source: Various issues of *Statistical Abstracts*, Punjab

The transport, storage and communication sectors consistently increased during every plan period. During 1966-67 to 1998-99, their share increased by 2.0 per cent points, banking and insurance by 4.7 per cent points and public administration by 2.5 per cent points. The sectors experiencing a decline in their share in SDP during the same period were real estate ownership of dwellings and business services (3.4% points) and other services (2.5% points).

Expenditure pattern: Spending on different sectors has had a direct bearing on the growth of the state economy. Budgetary expenditure by the government, during 1967-68 to 2000-01, increased 134 times from Rs. 95.74 crore to Rs. 12,861.74 crore. At the time of the formation of the state, in 1966, the development expenditure was two-thirds of the total budgetary expenditure, which was 5.2 per cent of the NSDP (L. Singh and S. Singh, 2002). It peaked to 72.1 per cent of the total budgetary expenditure in 1975-76, which was 7.7 per cent of the NSDP (Table 7). Thereafter, it started declining. During 1980-81 to 1990-91, it declined by seven per cent points, whereas its share in the NSDP increased by almost one per cent point. The decline in development expenditure was sharper in the 1990s. During 1990-91 to 2000-01, it decreased by 18.1 per cent points.

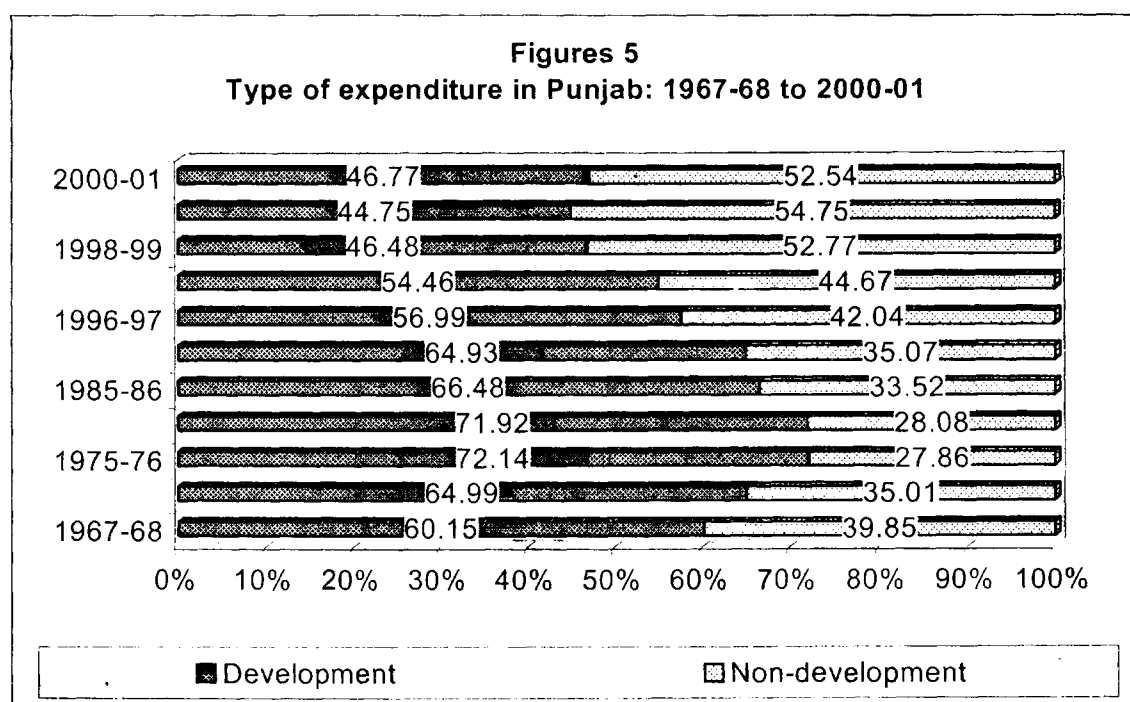
Table 7
Different Types of Expenditure in Punjab (in Rs crore and per cent shares)

Years	Budgetary expenditure	Development expenditure	Non-development expenditure	Capital expenditure as per cent of NSDP	Budgetary expenditure as per cent of NSDP	Development expenditure as per cent of NSDP
1967-68	95.74	60.15	39.84	-	8.6	5.17
1970-71	136.02	64.99	35.00	4.93	9.47	6.15
1975-76	278.27	72.14	27.85	-	10.7	7.72
1980-81	549.53	71.92	28.07	6.01	12.34	8.88
1985-86	1,162.9	66.48	33.71	6.03	13.98	9.3
1990-91	2,519.91	64.92	35.07	3.7	15.03	9.76
1996-97	6,925.67	56.99	42.04	2.34	16.84	9.59
1997-98	8,195.65	54.46	44.67	1.53	18.05	9.83
1998-99*	8,384.31	46.74	52.38	5.2	16.91	7.90
1999-00*	10,195.27	44.75	54.75	3.21	18.38	8.22
2000-01*	12,861.74	46.77	52.54	4.70	21.12	9.88

Source: Singh, L. and S. Singh (2002): Deceleration of Economic Growth in Punjab, Evidence, Explanation and a Way Out, *Economic and Political Weekly*, 9 February, 2002

*- Reserve Bank of India (various volumes): *State finances: A study of budgets*

Note: Figures in parenthesis are percent share.



Source: Same as in Table 7

During 1967-68 to 2000-01, the share of budgetary expenditure to NSDP increased from 8.6 per cent to 21.12 per cent points, an increase of 12.52 per cent points. In comparison, development expenditure increased from 5.2 per cent of NSDP to 9.9 per cent during the same period, an increase of only 4.7 per cent points.

Capital expenditure, which is considered to be the central force for creating capacity in social and economic infrastructural facilities for the use of the productive sectors of the economy, has declined sharply from a high of six per cent in 1985-86 to 4.7 per cent of NSDP in 2000-01. The declining capital expenditure is likely to put a constraint on the expansion of the future rate of economic growth. Decline in investment in both public and private sectors has affected the rate of economic growth of the state in the 1990s (L. Singh and S. Singh, 2002).

Plans-wise expenditure: Plan-wise expenditure on various sectors during the Fourth and the Ninth Plan reveals the predominance of the irrigation and power sectors. In the Fourth Plan, 59.4 per cent of the total expenditure was on these sectors. It rose to 66.1 per cent during the Seventh Plan (Table 8). By the Ninth Plan it came down to 51.1 per cent, but remains the major chunk of the total expenditure. In the social sector, the expenditure on social and community services was 12.2 per cent, which has risen to 28.4 per cent during the Ninth Plan period. At the time of the formation of the state, much emphasis was laid on the development of rural infrastructure through better transport and communication facilities. To reach the desired goals, the expenditure initially was 13.84 per cent of the total. The state attained one of the highest road densities and a well-developed infrastructure. Thereafter, it started declining in each successive plan period. By the Eighth Plan the expenditure on this sector came down to 3.68 per cent. It has slightly increased in the Ninth Plan.

Table 8
Sectoral Expenditure during Plan Periods, Punjab (per cent)

Major sectors of development	Fourth Plan	Fifth Plan	Sixth Plan	Seventh Plan	Eighth Plan	Ninth Plan*
Agricultural and allied sectors	10.29	11.73	10.69	7.91	5.4	4.9
Co-operation	1.47	1.22	2.09			
Irrigation and power	59.44	51.73	60.25	66.06	58.81	51.09
Industry and mineral	2.64	5.22	3.93	4.2	2.71	1.12
Transport and communication	13.84	8.8	6.03	3.98	3.68	4.84
Social and community services	12.23	20.38	16.24	13.44	22.83	28.42
Economic services	0.09	0.05	0.03	0.71	1.15	1.75
General services		0.87	0.74	0.87	1.95	4.00
Rural development				2.12	2.66	3.37
Special area programme				0.64	0.78	0.89
Science, technology and environment				0.07	0.03	0.03

Source: Various issues of *Statistical Abstracts*, Punjab

Note: * - Includes actual expenditure during 1997-01 and anticipated expenditure during 2001-02

The expenditure on agriculture and allied sectors has come down from 10.3 per cent in the Fourth plan to 4.9 per cent during the Ninth Plan. The reduction was more during the Sixth and Seventh Plan during which period it declined by 2.8 per cent points. The expenditure on industry and minerals was more or less the same in the Fourth and Eighth Plan periods. However, its share to total expenditure during the Fifth, Sixth and Seventh Plans rose to 5.2, 3.9 and 4.2 per cent respectively. Expenditure during the successive plan periods reveals an emphasis on irrigation and power, the two factors of development of agriculture and industry, respectively.

POVERTY

Estimates of poverty indicate a declining trend in the country as a whole and in Punjab as well. Comparable estimates based on somewhat consistent methodology and data are available until 1993-94. In the 55th Round Survey by NSSO, certain modifications have made the data incomparable with the earlier estimates of poverty. The overall poverty in the country declined from 54.88 per cent to 35.97 per cent during 1973-74 to 1993-94 as against a decline from 28.15 per cent to 11.77 per cent in the state (Table 9). At the national level, the decline in the population below the poverty line was steeper in rural areas than in urban areas during the same period. In Punjab, the trend was different. Here, the decline was more or less similar in both rural and urban areas. It was higher during 1973-74 to 1977-78, when it decreased from 28.15 per cent to 19.27 per cent, a fall of nine per cent. During this period, urban poverty was stagnant, whereas rural poverty declined by 12 per cent. This could have been due to the impact of the green revolution. At present only two states, Goa and Jammu and Kashmir, have a poverty level lower than Punjab. Poverty in Kerala was almost double (12.72%) that in Punjab (5.34%) in 1999-2000.

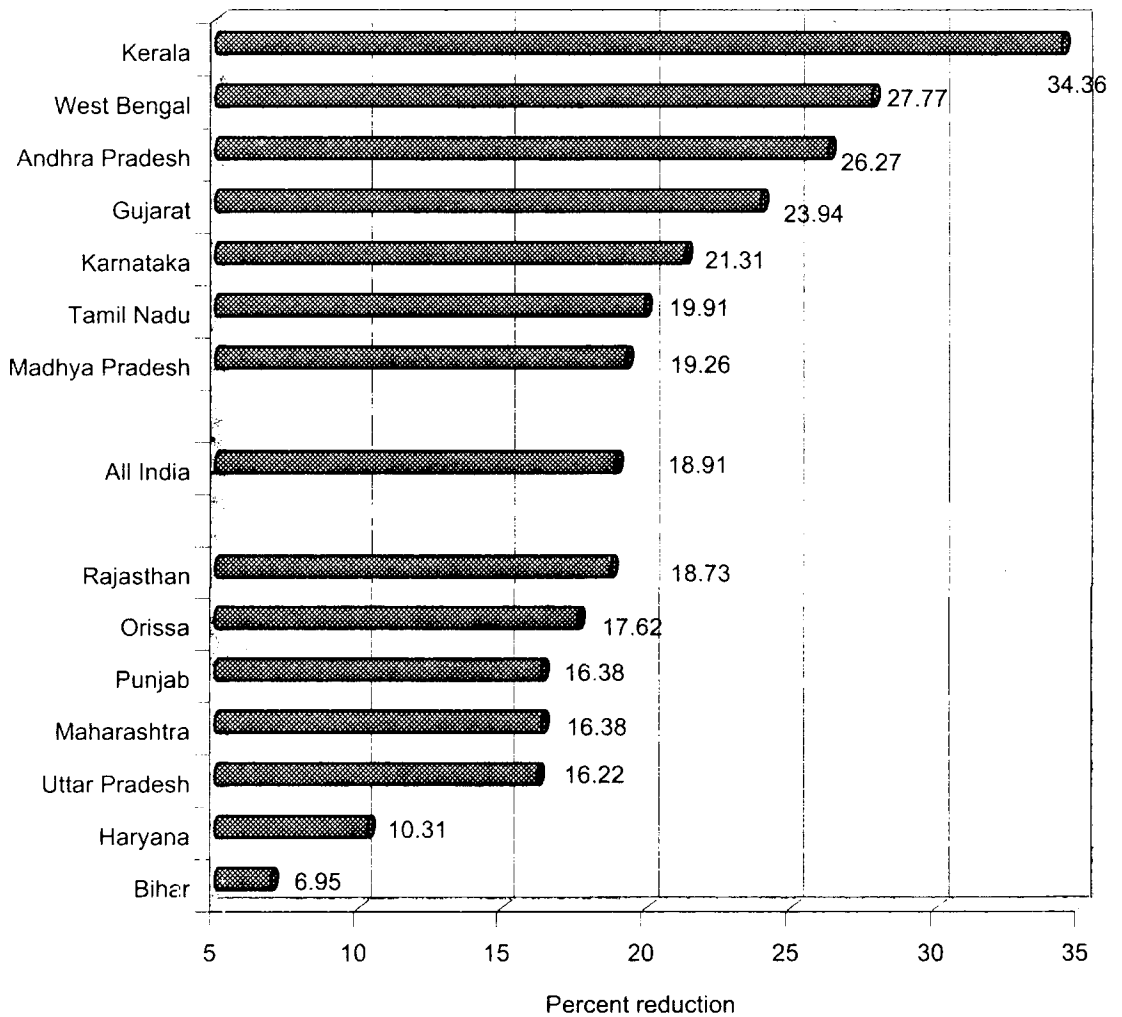
Table 9
Population Below Poverty Line in Punjab 1973-74 to 1999-2000

Year	Punjab			All India		
	Total	Rural	Urban	Total	Rural	Urban
1973-74	28.15	28.21	27.96	54.88	56.44	49.01
1977-78	19.27	16.37	27.32	51.32	53.07	45.24
1983	16.18	13.2	23.79	44.48	45.65	40.79
1987-88	13.2	12.6	14.67	38.86	39.09	38.2
1993-94	11.77	11.95	11.35	35.97	37.27	32.36
1999-00 (7 days recall period)	5.34	5.31	5.4	23.33	24.02	21.59
(30 day recall period)	6.16	6.35	5.75	26.10	27.09	23.62

Source : Various volumes of NSSO

Figure 6

Decline in Percentage of Persons Below Poverty Line
(1993-94 over 1973-74)



Source : Various volumes of NSSO

Poverty eradication schemes: A number of schemes for eradicating poverty in rural as well as urban areas have been operative in the state. In rural areas, Swaran Jayanti Gram Swan Rozgar Yojna and in urban areas, Swaran Jayanti Shahri Rozgar Yojna, besides other poverty alleviation schemes, are being implemented to provide sustainable income to the targeted groups in the respective areas.

AGRICULTURAL DEVELOPMENT

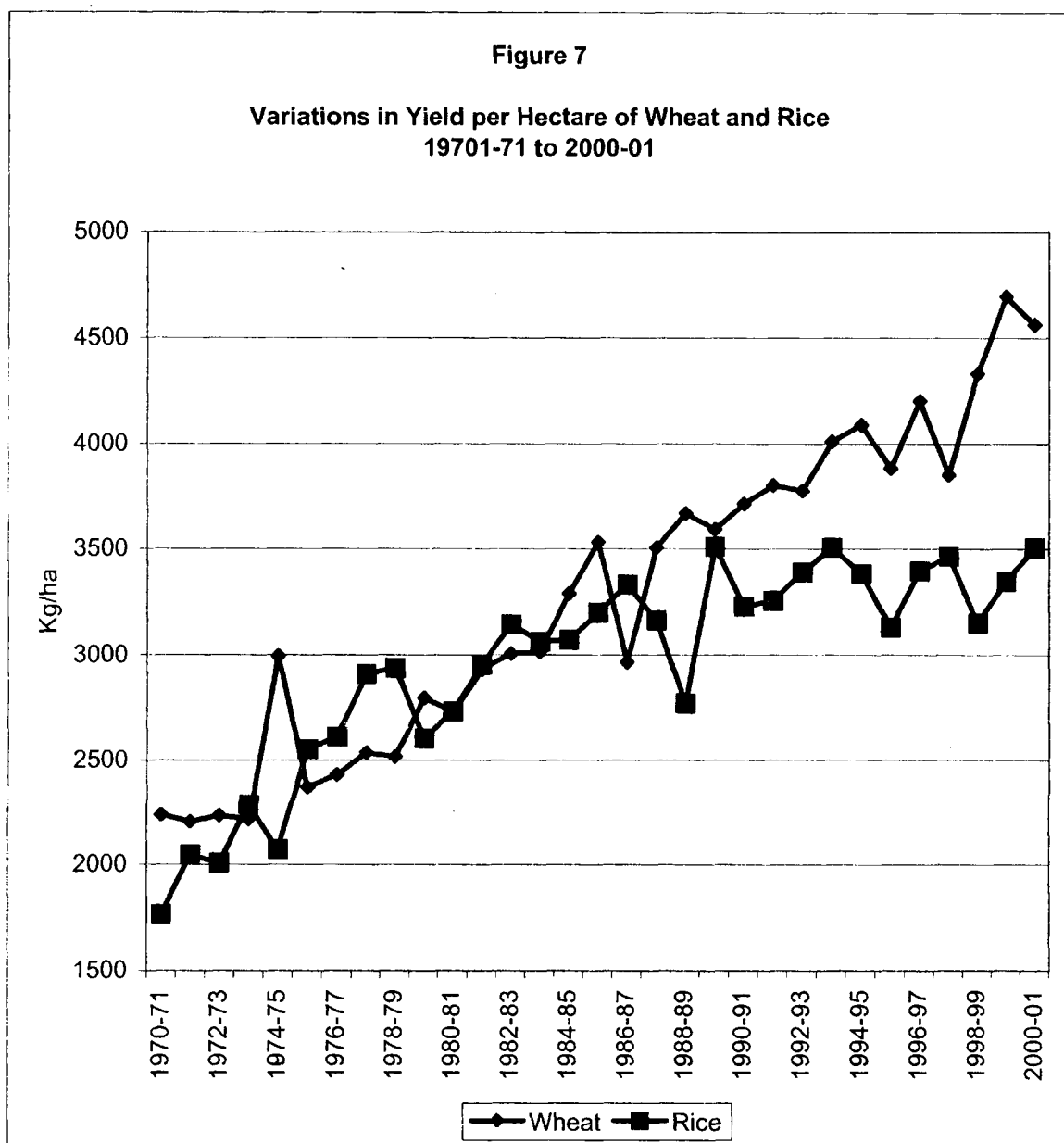
The state was a deficit area in food production at the time of partition, in 1947. At that time it lost 70 per cent of the income and the same percentage of canal irrigated area in the western part of undivided Punjab. Indian Punjab was left with meagre resources. In the present Punjab area, irrigational facilities were inadequate as per the requirements, livestock were of poor quality, literacy was low and the population lived mostly in rural areas. Not only was there a division of physical resources, but even technical skills were partitioned. Peasants in Indian Punjab had not acquired the same progressive skills in farming as their counterparts in West Pakistan. Soon after Independence, the Government of Punjab passed legislations and formulated schemes aiming at agricultural development.

Deficit to surplus: Over time, the situation has changed. From a food deficit area, the state has become a surplus producer not only in foodgrains like wheat and rice but also in cotton and sugarcane. This remarkable transformation was achieved due to the hard work of the farming community, determined efforts of successive governments, and adequate physical infrastructure in the form of terrain, fertile soils and a well-developed irrigation network.

Agriculture as the lead sector: The programmes and policies initiated for agricultural development in the state were effectively implemented compared to policies in other sectors of development. Respective state governments adopted and followed correct sequencing to achieve the desired goal in the field of agriculture. Policies put into operation began with consolidation of landholdings, followed by extension of cultivated and irrigated lands and still further strengthened by the use of fertilizers and high yielding variety seeds. In addition, problem areas such as the foothill (*kandi*) zone and the floodplain (*bets*) zone were identified and given special attention for the development of agriculture. The electrification of villages and their linkage with roads further enhanced and consolidated the gains of agricultural development.

Wheat-rice rotation: Gains of agricultural development, due to the green revolution, were shared mainly by two principal crops - wheat and rice. During 1966-67 to 2000-01, the area under wheat has increased 2.1 times and production 6.3 times (Table 10). The area under rice has increased seven times and yields two times during 1970-71 to 2000-01. The increasing productivity of these two crops during the last three decades or so has made it profitable to produce these. The steady growth in both the cultivated area and the resultant output was backed by refined agronomic practices, and fairly reasonable support prices.

The increasing profitability of these two crops over time has proved to be a hindrance to the diversification of agricultural production in the state. It has become the usual practice of the farming community to follow the paddy-wheat-paddy cycle. This is leading to serious ecological problems.



Source: Various issues of *Statistical Abstracts*, Punjab

Green revolution: The cumulative effect of the green revolution, became manifest by the beginning of 1990s. The net sown area of the state increased from 40,53,000 hectares in 1970-71 to 42,18,000 hectares in 1990-91 and 42,64,000 hectares in 2000-2001. The cropping intensity, which was 133 in 1967, increased to 187 in 1999. This is the highest in the country. In 1970-71, 73 and 36 per cent of the total area were under high yielding varieties (HYVs) of wheat and rice respectively. By 1990-91, these rose to 99.7 per cent and 97.5 per cent respectively. On 30 June 1999, 100 per cent of the area under wheat and 97.6 per cent under rice were covered by HYVs.

Table 10
Area, Production, and Yield of Wheat and Rice Crops, Punjab, 1966-67 to 2000-01

Year	Wheat			Rice		
	Area (000 ha)	Production (000 mt)	Yield (kg/ha)	Area (000 ha)	Production (000 mt)	Yield (kg/ha)
1966-67*	1,608	2,449	1,520			
1967-68*	1,709	3,335	1,863			
1968-69*	2,063	4,491	2,177			
1969-70*	2,191	4,918	2,245			
1970-71	2,299	5,145	2,238	390	688	1,764
1971-72	2,336	5,618	2,204	450	920	2,045
1972-73	2,404	5,368	2,233	476	955	2,007
1973-74	2,338	5,181	2,216	499	1,140	2,287
1974-75	2,206	5,284	2,995	569	1,179	2,071
1975-76	2,449	5,809	2,372	567	1,447	2,553
1976-77	2,630	6,292	2,432	680	1,776	2,611
1977-78	2,620	6,648	2,537	858	2,497	2,910
1978-79	2,734	7,423	2,517	1,052	3,090	2,937
1979-80	2,823	7,996	2,797	1,172	3,052	2,604
1980-81	2,808	7,669	2,731	1,183	3,233	2,733
1981-82	2,917	8,553	2,932	1,269	3,750	2,955
1982-83	3,054	9,183	3,007	1,322	4,156	3,144
1983-84	3,124	9,419	3,015	1,481	4,536	3,063
1984-85	3,096	10,183	3,289	1,644	5,052	3,073
1985-86	3,113	10,992	3,531	1,714	5,485	3,200
1986-87	3,189	9,458	2,966	1,786	5,949	3,331
1987-88	3,139	11,005	3,506	1,720	5,442	3,164
1988-89	3,156	11,576	3,668	1,778	4,925	2,770
1989-90	3,251	11,681	3,593	1,905	6,680	3,510
1990-91	3,273	12,159	3,714	2,016	6,511	3,229
1991-92	3,237	12,309	3,802	2,069	6,739	3,257
1992-93	3,283	12,399	3,776	2,072	7,026	3,391
1993-94	3,335	13,378	4,011	2,179	7,645	3,507
1994-95	3,311	13,542	4,090	2,265	7,703	3,382
1995-96	3,221	12,510	3,883	2,185	6,843	3,131
1996-97	3,232	13,687	4,203	2,159	7,334	3,396
1997-98	3,301	12,751	3,853	2,278	7,890	3,465
1998-99	3,278	14,192	4,332	2,518	7,993	3,152
1999-00	3,388	15,910	4,696	2,604	8,716	3,347
2000-01	3,408	15,551	4,563	2,612	9,157	3,506

Source: Various issues of *Statistical Abstracts*, Punjab
Singh, H. (2001): *Green Revolution Reconsidered: The Rural World of Contemporary Punjab*, Oxford, New Delhi

Mechanization: The green revolution in the late sixties greatly benefited agricultural development in the state in terms of its mechanization as well. There was a change in the technology of farming, with heavy investment in irrigation, fertilizers, and chemicals

to control pests and weeds. Besides the introduction of high yielding varieties, tractorization greatly boosted agricultural development in the state. The popularity of tractorization can be judged from the fact that, with less than three per cent of the country's cultivated land, Punjab accounted for about 30 per cent of the total tractors in India in 1972 (Gosal, G.S. and G. Krishan, 1984). Tractors, threshers and crushers hold the most prominent position in the mechanization of agriculture in the state.

Fertilizer use: The consumption of fertilizers in the state has multiplied manifold. It was consuming 51 thousand nutrients tonnes in 1966-67, which increased to 290 thousand in 1970-71, 1,098 thousand in 1985-86 and to 1,314 thousand nutrient tonnes in 2000-2001. In comparison with the national average of 8.74 kilogram per hectare of gross cropped area in 1971-72, the state was consuming 50.7 kilogram. The difference widened over time. In 1979-80, the state was consuming 104.96 kilogram per hectare of gross cropped area as against 30.4 kilogram at the national level.

Energy input: High consumption of electricity by the farmer is another distinguishing factor responsible for the state's agricultural development. Consumption of electricity increased from 46.3 crore kwh in 1970-71 to 823.3 crore kwh in 1999-2000, an eighteen-times increase. The number of consumers increased from 91,410 to 794,475, an increase of 8.7 times. Consumption of electricity in 1999-00 was at its peak. During this year, it rose to 823.3 crore kwh, which was 130.2 crore kwh more than in the previous year.

Small size of landholdings: Another typical feature of Punjab's agriculture is the predominance of small size of landholdings and their further fragmentation. During 1980-81 to 1990-91, the number of operational landholdings increased from 10,27,000 to 11,11,951. The average size of the landholdings decreased from 3.81 hectares in 1980-81 to 3.77 hectares in 1985-86 and 3.61 hectares in 1990-91. Seventy per cent of the landholdings are less than four hectares. Landholdings with a size of 10 hectares and above declined from 7.2 per cent to six per cent during 1980-81 to 1990-91. In contrast, landholdings with less than one hectare have increased from 19.2 to 26.5 per cent during the same duration. Fragmentation of landholdings and the resultant reduction in size have posed a serious threat to the farming community who are more or less dependent on agricultural produce. The size of landholdings is one factor hampering the diversification of agricultural production in the state.

Agricultural marketing: The State Agricultural Marketing Board, established in the early sixties, provided space to market arrivals in the state. This has expanded. The number of regulated markets, the average number of villages served per regulated market and the average area served per regulated market have been upgraded. The number of regulated markets increased from 88 in 1966-67 to 144 in 2000-01. The number of markets increased from 109 to 123 during 1979-80 to 1981-82. Consequently, the average number of villages served per regulated market declined from 112 to 99 and the average area served per regulated market from 462 sq. kms. to 409 sq. kms. Since 1992-93, the number of markets has not changed. Besides the State Agricultural Marketing Board other agencies, viz., the Food Corporation of India, Punjab Agro Industries Corporation, PUNSUP, are also involved in marketing agricultural produce in the state.

Marketing yards have increased in number over time but qualitatively are still not up to the mark. Most of the marketing yards do not have a concrete surface to keep the

arrivals in good condition. The surface is dusty, as wheat and rice are kept in the open and not well protected during the rainy season. Consequently, the quality of stored stocks deteriorates. There are instances in different parts of the state when the stock had to be destroyed.

Declining share of contribution to central pool: Since other states are gradually coming under the green revolution, the share of Punjab's contribution of wheat and rice to the central pool has declined over time. The decline in the share of wheat is much sharper than of rice. The state was contributing 73 per cent share to the central pool in 1980-81, which has declined to 57.6 per cent in 2000-01, a fall of 15.4 per cent points (Table 11). The share of rice has declined by nine per cent points during the same period.

Table 11
Contribution of Wheat and Rice of Punjab in Central Pool 1980-81 to 2000-01

Year	Rice		Wheat	
	Contribution to the central pool (lakh tonnes)	Percentage share to contribution	Contribution to the central pool (lakh tonnes)	Percentage share to contribution
1980-81	25.2	45.3	42.8	73.0
1981-82	30.9	42.5	37.6	57.1
1982-83	32.3	46.0	48.3	62.5
1983-84	32.8	41.9	51.7	62.3
1984-85	42.7	43.6	50.1	53.9
1985-86	41.8	42.8	61.5	59.4
1986-87	43.3	47.1	64.8	61.5
1987-88	33.6	48.8	44.2	56.1
1988-89	29.6	38.9	47.5	72.7
1989-90	50.0	46.0	56.0	62.2
1990-91	48.2	41.0	67.5	61.0
1991-92	42.5	46.7	55.4	71.5
1992-93	49.0	42.3	44.9	70.3
1993-94	54.9	40.2	64.9	50.6
1994-95	58.3	43.5	72.9	61.4
1995-96	34.6	34.8	73.0	59.2
1996-97	42.2	38.4	56.3	68.8
1997-98	60.4	42.2	59.6	64.3
1998-99	43.8	37.2	61.5	48.6
1999-00	67.9	42.1	78.3	55.4
2000-01	69.4	36.3	94.2	57.6

Source: Various issues of *Statistical Abstract*, Punjab

Distressful loan recovery: The gap in capital inputs and the resultant output has widened over time in the state. The institutional credit system has not been able to effectively involve small farmers. They are borrowing money from local moneylenders (*aartias*). This has created a peculiar situation in the state. Due to non-payment of credit, farmers are under great stress. The reported suicides by farmers in certain pockets of

the state are an indicator of the stressful agricultural system. In the recent past, farmers have resorted to selling their tractors for clearing their debts to local moneylenders.

Milk production: The emphasis on foodgrains initially was accompanied by diversification in livestock farming. The green revolution in the state was followed by a white revolution. Production of milk multiplied manifold under the well-conceived policy of the state government. It increased from 1,920 thousand tonnes in 1968-69 to 7,774 thousand tonnes in 2000-2001, a four-fold increase (Table 12). In the early 70s, increase in milk production was sharper. In 1971-72, milk production increased by 385 thousand tonnes as compared to the preceding year. The per capita availability of milk per day in the state increased from 375 grams in 1968-69 to 870 grams in 2000-2001.

Dairying in Punjab is not without some problems. The quality of cows and buffaloes is not up to the mark. Per capita production of cows and buffaloes in the state is much lower than in other parts of the world. This sub-sector of agriculture needs serious attention and investment from the policy makers to exploit its potential in improving the rural economy, and the nutrition level of the people.

Table 12
Production and Per Capita Availability of Milk in Punjab 1968-69 to 2000-01

Year	Milk production (000 tonnes) per annum	Estimated population ('000)	Per capita availability of milk (kg.) per annum	Per capita availability of milk (grams) per day
1968-69*	1,920	14,035	137	375
1970-71	1,823	13,441	159	437
1975-76	2,400	14,792	162	444
1980-81	3,221	16,304	197	541
1985-86	4,035	18,521	218	597
1990-91	5,142	20,615	249	682
1991-92	5,382	21,102	255	698
1992-93	5,583	20,789	260	735
1993-94	5,970	21,176	292	770
1994-95	6,215	21,910	287	788
1995-96	6,424	22,328	291	798
1996-97	6,755	22,504	301	825
1997-98	7,165	23,189	309	845
1998-99	7,394	23,700	312	855
1999-00	7,706	24,100	320	875
2000-01	7,774	24,400	317	870

Source: Same as in Table 10

Constraints: On the whole, agriculture in Punjab is in a crisis, which in turn, has influenced the overall economy of the state. The share of agriculture to the state income, which was one-third in 1993-94, has come down to one-fourth in 2000-2001 (at 1993-94 constant prices). Inability to diversify agriculture, market the agricultural produce and static productivity levels in the state are symptoms of a crisis in this sector. The maximum productivity achieved a few years ago has remained more or less the same. Chances of rapid increase in productivity in the near future in the state are also remote.

INDUSTRIAL DEVELOPMENT

The state cannot take equal pride in industrial development as in agriculture. It inherited a weak industrial base at the time of partition in 1947, as the majority of the industrial establishments and the areas supplying raw materials remained in West Punjab (Pakistan). Fear and panic prevented entrepreneurs from investing in industries in a state with a long sensitive international border with a hostile neighbour. The state had to pay for the wars of 1962, 1965 and 1971. These resulted in further flight of capital from Punjab. Moreover, in 1966, with the reorganization of the state, whatever mineral and forest resources it had went to Himachal Pradesh. Industrial complexes, which were around Delhi, went to Haryana.

Predominance of small-scale industries: Small-scale industries dominate the industrial structure in the state. The localization of development in the small-scale sector and its supremacy over the large-scale industries is the outcome of many factors. The state did not have many rich capitalists to invest in large-scale industry and investment by the central government was meagre. Because of the closeness of sensitive international border with Pakistan, capitalists from other parts of India and government agencies were reluctant to invest in big industries. In addition, lack of metallic minerals and fossil fuels required for the establishment of large-scale industries forced industrialists to undertake small-scale industries.

The predominance of small-scale industries in the state can be judged from the fact that during 1973-74 small-scale industries accounted for more than three-fifths of the total industrial production as against two-fifths at the national level. Small-scale industries have grown substantially since 1966. The total number of small-scale industrial units increased from 8,023 in 1966 to 2,00,603 in 2000-01 (Table 13). During the same period, the workforce employed in this sector increased from 56,000 to 8,97,417. Fixed investment increased from Rs. 60 crore to Rs. 4,250 crore and production from Rs. 200 crore to Rs. 19,525 crore during 1966-67 - 2000-01 (P). During the same period, the number of units in the small sector grew at the rate of 9.6 per cent per annum while employment provided by them increased at an annual rate of 8.2 per cent, with the result that the average per unit persons employed declined from seven in 1966-67 to four in 2000-01 (P). Per unit average fixed investment increased from Rs. 0.74 lakh in 1966-67 to Rs. 1.89 lakh in 2000-01 (at current prices). Employment generated per crore rupees invested has dropped from 933 in 1966-67 to 211 in 2000-01 (at current prices). In the eighties, employment generated per crore rupees invested was 614 persons as against 342 in nineties.

Table 13
Status of Small-scale Industries in Punjab 1966-67 to 2000-01

Year	Number of units	Employment (no.)	Fixed investment (Rs. crore)	Production (Rs. crore)
1966-67*	8,023	56,000	60.0	200.0
1974-75	18,114	1,22,162	134.0	484.0
1975-76	20,271	1,36,334	153.0	568.3
1976-77	22,298	1,52,638	169.0	633.0
1977-78	24,231	1,63,134	195.0	702.0
1978-79	27,509	1,86,197	225.0	779.0
1979-80	33,716	2,23,979	273.0	924.0
1980-81	43,338	2,64,869	332.0	1,118.0
1981-82	54,021	3,04,155	402.0	1,343.0
1982-83	64,901	3,39,972	492.0	1,586.0
1983-84	76,588	3,78,846	572.0	1,786.0
1984-85	88,271	4,24,478	656.0	1,958.0
1985-86	97,517	4,64,809	739.0	2,151.0
1986-87	1,08,913	5,03,397	830.0	2,359.0
1987-88	1,19,888	5,45,560	943.0	2,682.0
1988-89	1,32,962	5,94,354	1,064.0	3,109.0
1989-90	1,46,443	6,33,964	1,218.0	3,504.0
1990-91	1,60,388	6,68,845	1,349.0	4,050.0
1991-92	1,76,378	7,11,417	1,499.0	4,437.0
1992-93	1,81,563	7,32,580	1,621.0	5,345.0
1993-94	1,84,875	7,55,883	1,764.0	7,075.0
1994-95	1,88,241	7,76,763	1,973.0	8,737.8
1995-96	1,91,025	8,02,329	2,216.1	9,713.9
1996-97	1,93,332	8,21,170	2,491.3	11,106.2
1997-98	1,95,383	8,40,568	2,859.9	13,057.7
1998-99	1,97,344	8,64,592	3,360.7	14,444.5
1999-00	1,99,071	8,83,005	3,793.7	16,610.8
2000-01 (P)	2,00,603	8,97,417	4,250.0	19,525.0

Source: Same as in Table 10

Increasing large/medium units: Large-scale industrial units increased from 122 in 1966 to 132 in 1974-75, and from 355 in 1989-90 to 638 in 2000-01 (Table 14). During the same period, the workforce employed in this sector increased from 42,735 to 57,891 to 1,69,801 and 2,51,890 respectively. The fixed investment increased from Rs. 104.0 crore in 1966-67 to Rs. 17,000.0 crore (P) in 2000-01. Production increased from Rs. 93.0 crore in 1966-67 to Rs. 35,600.0 crore (P) in 2000-01 (at current prices). Per unit average fixed investment increased from Rs. 85.2 lakh in 1966-67 to Rs. 2,416.7 lakh in 2000-01 (P). Per unit average fixed investment has started increasing sharply since the early nineties. Per unit average fixed investment in 1989-90 was Rs. 868.4 lakh, which increased to Rs. 1,254.6 lakh by 1992-93. Unlike small-scale industries, large/medium industries have become relatively more capital intensive. Employment generated per crore rupees invested has dropped from 411 in 1966-67 to less than 15 in 2000-01 (at

current prices). In the eighties, the employment generated per crore rupees invested in the large/medium industry was 88 persons as against 24 in the nineties.

Table 14
Status of Large/Medium Industries in Punjab 1966-67 to 2000-01

Year	Number of Units	Employment (No.)	Fixed investment (Rs. crore)	Production Rs. (crore)
1966-67	122	42,735	104.0	93.0
1974-75	132	57,891	109.0	308.0
1975-76	144	63,291	196.0	385.0
1976-77	160	69,942	257.0	471.0
1977-78	175	77,971	310.0	607.0
1978-79	188	91,551	379.0	711.0
1979-80	203	97,533	629.0	869.0
1980-81	228	1,07,767	727.0	1,141.0
1981-82	237	1,09,081	835.0	1,529.0
1982-83	243	1,20,925	962.0	1,826.0
1983-84	254	1,24,819	1,099.0	1,993.0
1984-85	273	1,31,381	1,252.0	2,071.0
1985-86	292	1,32,174	1,490.0	2,535.0
1986-87	306	1,42,381	1,401.0	3,185.0
1987-88	322	1,51,990	2,067.0	3,778.0
1988-89	335	1,60,609	2,452.0	4,379.0
1989-90	355	1,69,801	3,083.0	5,458.0
1990-91	373	1,87,311	4,003.0	7,164.0
1991-92	395	1,93,789	4,552.0	7,709.0
1992-93	414	1,88,034	5,194.0	9,335.0
1993-94	440	2,00,000	5,800.0	11,000.0
1994-95	475	2,06,722	6,420.0	13,500.0
1995-96	526	2,10,448	8,744.1	16,656.1
1996-97	586	2,19,383	9,744.6	21,387.1
1997-98	620	2,21,154	11,720.1	25,406.0
1998-99	602	2,27,929	14,038.1	25,376.0
1999-00	611	2,35,993	14,765.8	23,720.1
2000-01 (P)	638	2,51,890	17,000.0	35,600.0

Source: Same as in Table 10

Small-scale industries in the state are getting linked over time to large-scale industries as ancillaries. Consequently, their production process is getting more modernized. However, small-scale units are still backward and usually depend on relatively less skilled labour, willing to accept jobs with poor working conditions and low wages. This makes job opportunities unattractive for the educated youth, as a result of which educated unemployment continues to grow at an alarming rate despite an impressive growth rate of industrial production (Abbi, B. L. and Singh, Kesar, 1997).

Industrial dispersal: Another typical feature of the industrial structure in the state is drifting of industries towards rural locations. Both small and large/medium industries have evidently moved towards rural areas. In 1979-80, of the total small-scale industries, 27,428 were in urban areas and 6,288 in rural areas. The situation has changed since. Industries in rural locations have increased at a higher pace than in urban areas. During 1989-90 - 1993-94, industries in rural areas increased 28.5 per cent as against 24.6 per cent in urban areas. There was a similar shift there in large/medium industries. In 1966, of 65 industries classified as large/medium, only 10 were located in rural areas, whereas 55 of them were in urban areas. By 1998 as many as 330 units were in rural areas against 227 in urban areas. Prior to 1966, even though dependent on the rural economy for their raw materials, industrial units could not depend upon the rural environment for the supply of basic infrastructure and skilled personnel and, therefore, were established in urban areas. The situation has changed over time. Proximity to raw materials supported by improved infrastructure, communications, roads and availability of skilled manpower has attracted industries to rural areas. The state government has taken the initiative to move industries towards rural areas by setting up focal points there, but this policy seems to have had little impact on the distributional pattern of industries. The number of these focal points remained static (362) during 1984 to 1997. Apart from this, support in the form of capital subsidies, availability of electric connection and tax incentives have encouraged setting up of industries in rural areas. As a result, they have attracted industrial entrepreneurs from adjacent urban locations. (Singh, H. 2001).

Industry-agriculture linkage: The green revolution in the state gave a big boost to the industrial economy through both forward and backward linkages and continuous transfer of resources from agriculture to industry (Gill, 1994, pp. 46-57). This is reflected in the relatively higher growth rate of the manufacturing sector than the agricultural sector. The post-liberalization situation has made the state government focus on the development of agro-based industries, to capitalize on Punjab's competitive advantage in food production.

Constraints: Industries in the state are making headway, despite such constraints as location on a hostile border and near absence of mineral resources. The employment absorption capacity of industries, especially of local labour, has declined.

HUMAN DEVELOPMENT

With a population of 2.43 crore, according to the 2001 Census, Punjab is one of the less populous states in India. As a comparison, Uttar Pradesh recorded a population of no less than 16.61 crore in 2001. This population of Punjab is, however, more than that of Australia at 1.94 crore. The state has experienced an almost two-fold increase in its demographic size since its formation in 1966. The urban population constitutes 34 per cent of the total population with three-fifths concentrated in 14 cities, each with a population of at least one lakh. The average population size of a village, which typically is an agglomerated settlement, is about 1,908 persons.

Man-land ratio: Punjab, with 482 persons per square kilometre is more densely populated than India as a whole, with 324 persons per square kilometre. There are striking variations; Ludhiana (824) is the most crowded while Muktsar (297) is the most thinly populated.

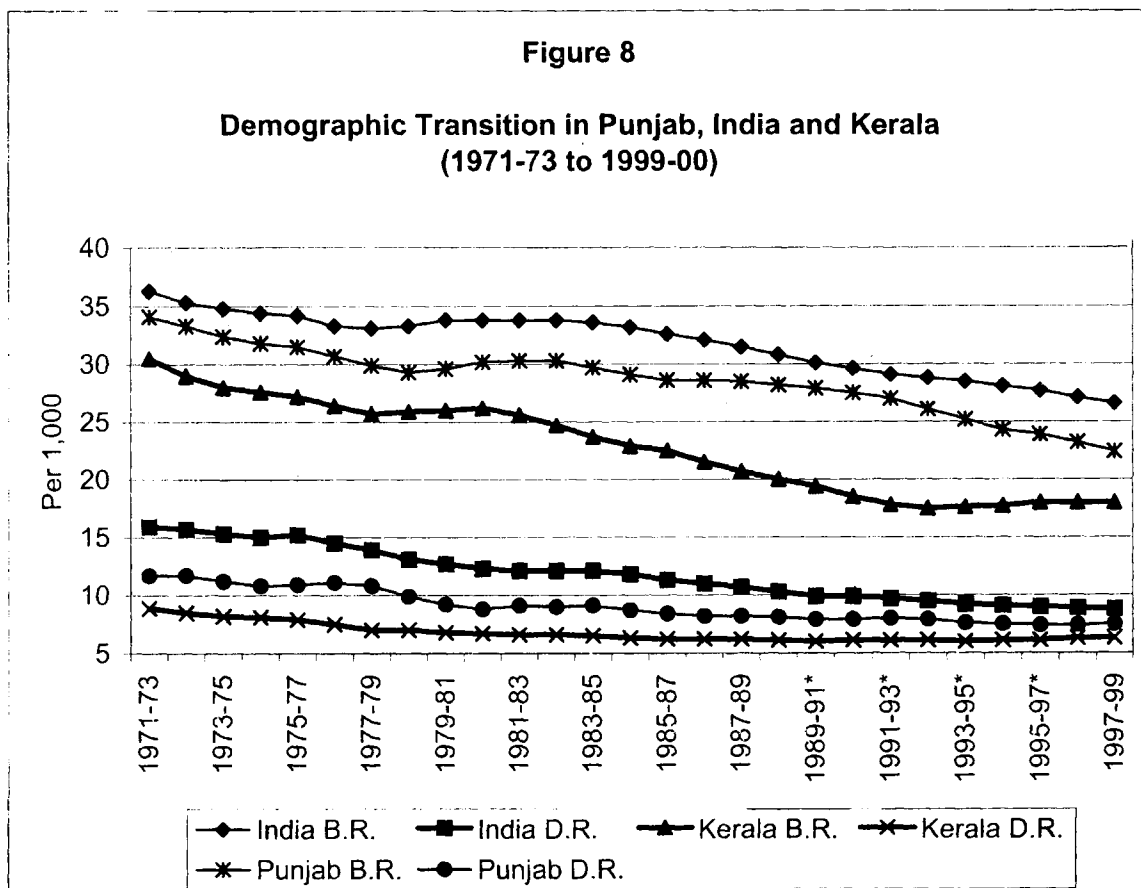
Growth of population: The state recorded an average annual population growth rate of 1.96 per cent during 1971-2001. A slow but steady decline in the population growth rate has been observed: 2.2 per cent during 1971-81, 1.9 per cent during 1981-91 and 1.8 per cent during 1991-2001. By comparison, India's population has grown at an average annual rate of 2.1 per cent during 1971-2001.

Birth rate: Realizing that rapid population increase would negate the benefits of development, the state government has been trying to control the growth rate of population through its family planning programmes. Achievements in slowing down the growth rate are not that disappointing: the birth rate was 34.1 during 1971-73 and 22.4 during 1997-99. The comparable fall in India's birth rate was from 36.2 to 26.6 during the same period. Punjab's performance in fertility decline was superior to the national average, but was found wanting when compared to that of Kerala, where the birth rate came down from 30.5 to 18.

Death rate: Equally noticeable is the decline in Punjab's death rate from 11.7 in 1971-73 to 7.5 in 1997-99. Comparable figures for India are 15.9 and 8.8 respectively. This signifies that not only the birth rate but the death rate too declined faster in Punjab than in the country as a whole.

Concern for human development: However, the overwhelming attention paid to economic upliftment was not matched by adequate care for some of the critical parameters of human capital, including infant mortality, literacy, sex composition, and reproductive health. Plan documents did voice a concern for human wealth: The primary objective of the First Plan (1951-56) was to raise the standard of living and to expand opportunities for a richer and more varied life and the Ninth Plan (1997-2002) reiterated the importance of focusing on human development. Despite such a strong concern for the development of human capital and a perspective for eliminating the worst forms of human deprivation, the state's achievements have been mixed.

Indicators of human development: There are various indicators of human development. However, the general consensus is on those in which children survive after birth and live a long and healthy life, people are literate and economically productive and acquire a decent standard of living. Such indicators as infant mortality rate, life expectancy, literacy, gender sensitization (sex ratio), and economic well-being have been used to find out the status of human development in the state. These indicators in Punjab *vis-a-vis* other states are discussed in detail in the following sections.



Source: Registrar General India (1999), *Compendium of India's Fertility and Mortality Indicators 1971-1997* based on Sample Registration System, New Delhi, 1999 and various other volumes

Infant mortality rate: The number of children dying, before celebrating their first birthday, per thousand live births, is called the infant mortality rate (IMR). It reflects the state of social development and the physical quality of life in an area. Within it are capsuled the nutrition level of the mother and child before and after birth, health-care facilities available, and the status of the girl child, in particular. Infant mortality has a strong association with poverty. Ultimately, it is the income level, which is going to determine the quality of nutrition and reproductive health care. Of course, in societies suffering from gender prejudice against females, the newly born girl child becomes more vulnerable to mortality. Punjab's infant mortality rate at 52 in 2000 (Table 15) was little less than the world average of 56; it is significantly lower than 68 at the national level. On the other hand, Punjab's IMR is almost four times higher than that of Kerala which is noted for its higher status of women, better health-care system, and superior literacy rates. In fact, most of the northern Indian states, such as Rajasthan (79), Uttar Pradesh (83), and Madhya Pradesh (88) are noted for higher infant mortality rates than the southern and western Indian states, such as Kerala (14), Tamil Nadu (51) and Maharashtra (48).

It is ironical that the drop in the IMR of Punjab from 102 in 1971 to 52 in 2000, that is, by 50 points, was of a lower order than that in India, from 129 to 68, that is by 61 points, notwithstanding the commendable progress made by the state in economic terms.

Kerala's IMR dropped from 58 to 14 during the same period. This signifies that social development is no less critical than economic development in containing IMR.

Table 15
Infant Mortality Rates in Selected States in India 1971 to 2000

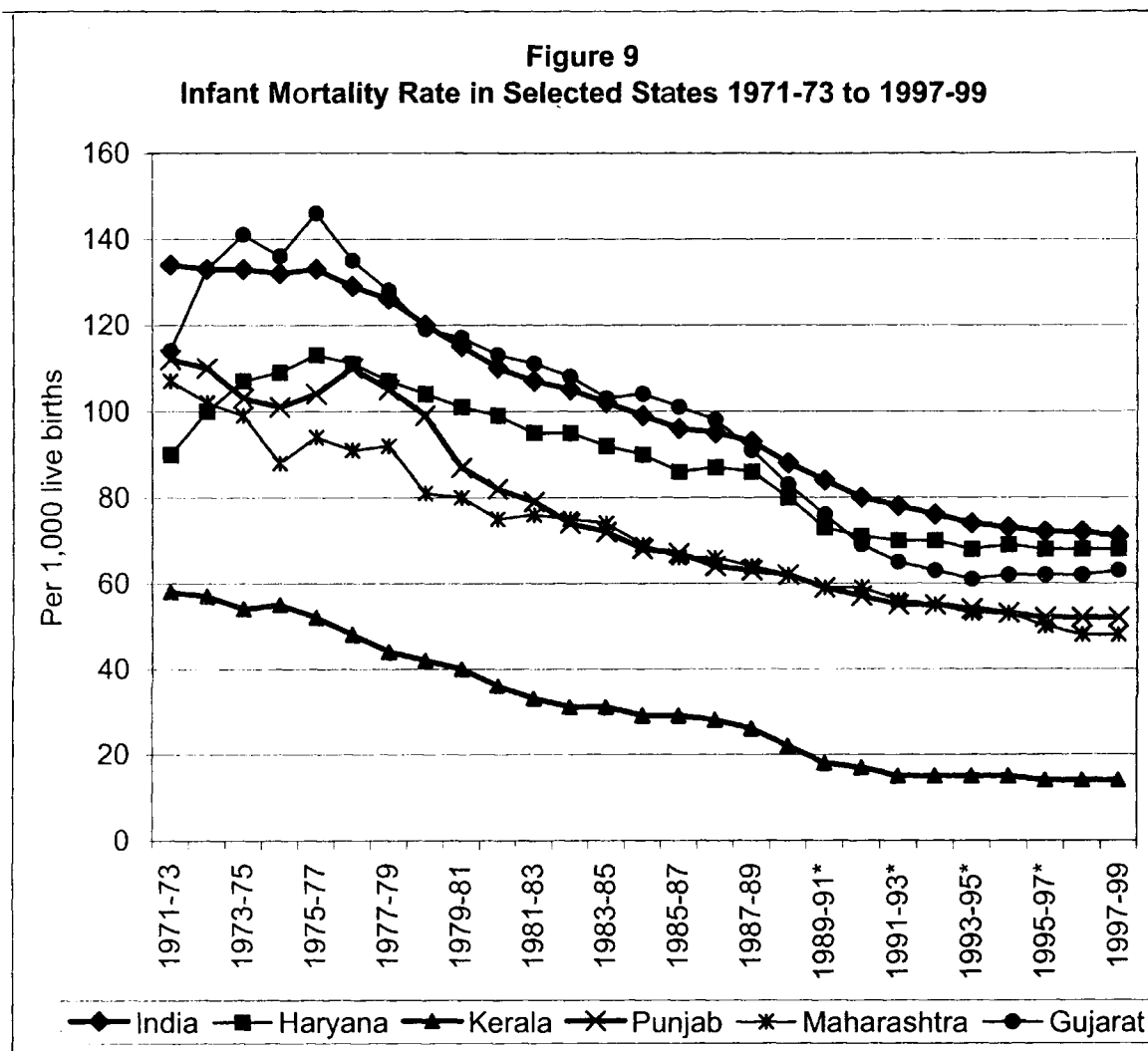
Year	Pun.	Har.	Ker.	Kar.	T.N.	India	Mah.	Bihar	Raj.	U.P.	Ori.	M.P.	A.P.	W.B.	Guj.
1971	102	72	58	95	113	129	105			167	127	135	106		144
1972	119	94	63	95	121	139	101		123	202	131	156	116		128
1973	115	104	54	90	108	134	116		137	176	145	145	105		161
1974	97	102	54	86	106	126	89		133	172	150	137	111		109
1975	98	114	54	80	112	140	92		155	198	149	151	123		154
1976	108	112	56	89	110	129	83		142	178	127	138	122		146
1977	105	113	47	83	103	130	108		142	168	147	148	125		138
1978	117	109	42	82	105	127	81		140	177	133	143	117		122
1979	92	100	43	83	100	120	86		109	162	149	143	106		123
1980	89	103	40	71	93	114	75		105	159	143	142	92		113
1981	81	101	37	69	91	110	79	118	108	150	135	142	86	91	116
1982	75	93	30	65	83	105	70	112	97	147	132	134	79	86	111
1983	80	91	33	71	87	105	79	99	109	155	126	125	77	84	106
1984	66	101	29	74	78	104	76	95	122	155	131	121	78	82	106
1985	71	85	31	69	81	97	68	106	108	142	132	122	83	74	98
1986	68	85	27	73	80	96	63	101	107	132	123	118	82	71	107
1987	62	87	28	75	76	95	66	101	102	127	126	120	79	71	97
1988	62	90	28	74	74	94	68	97	103	124	122	121	83	69	90
1989	64	82	21	80	68	91	59	91	96	118	121	117	81	77	86
1990	61	69	17	70	59	80	58	75	84	99	122	111	70	63	72
1991	53	68	16	77	57	80	60	69	79	97	124	117	73	71	68
1992	56	75	17	73	58	79	59	73	90	98	115	104	71	65	67
1993	55	66	13	67	56	74	50	70	82	94	110	106	64	58	58
1994	53	70	16	67	59	74	55	67	84	88	103	98	65	62	64
1995	54	69	15	62	54	74	55	73	86	86	103	99	67	58	62
1996	51	68	14	53	53	72	48	71	85	85	96	97	65	55	61
1997	51	68	12	53	53	71	47	71	85	85	96	94	63	55	62
1998	54	69	16	58	53	72	49	67	83	85	98	97	66	53	64
1999	53	68	14	58	52	70	48	63	81	84	97	90	66	52	63
2000	52	67	14	57	51	68	48	62	79	83	96	88	74	51	62

Source: Registrar General India (1999), *Compendium of India's Fertility and Mortality Indicators 1971-1997*, based on Sample Registration System, New Delhi, 1999 and various other volumes

Note: Pun.- Punjab Har. - Haryana Ker. - Kerala
T.N.- Tamil Nadu Mah.- Maharashtra Raj. - Rajasthan
U.P - Uttar Pradesh Ori. - Orissa M.P. - Madhya Pradesh
A.P.- Andhra Pradesh W.B.- West Bengal Guj. - Gujarat

The state did succeed in narrowing down the rural-urban gap in IMR during 1971-2000 from 109 to 56 in rural areas and from 76 to 38 in urban areas. But its performance was lower than at the national level. The rural-urban gap narrowed down by 31 points in India

as against 18 in Punjab. Among the different states of India, Kerala is to be commended not only for one of the lowest IMRs but also for achieving rural-urban parity on this count.



Source: Registrar General India (1999), *Compendium of India's Fertility and Mortality Indicators 1971-1997*, based on Sample Registration System, New Delhi, 1999 and various other volumes

Life expectancy: For the period 1992-96, Punjab was noted for a life expectancy of 67 years at birth, a figure, which was comparable to that of Brazil, Indonesia and Russia. By that count, a child born in Punjab could hope to live six years longer than its counterpart in India as a whole, where the life expectancy was 61 (Table 16). However, Punjab was considerably behind Kerala, with a life expectancy of 73 years. Likewise, the prolongation of life expectancy in Punjab by nine years during 1970-75 to 1992-96 was less than in Tamil Nadu (14 years), Gujarat (13 years) and Kerala (11 years). The international conference on Population Development had set a target of achieving a life expectancy of 70 by 2005 and 75 by 2015. Punjab, at its present pace of rise in life expectancy by one year every two years, might just be in a position to reach these target figures.

Table 16
Life Expectancy in Selected States during 1970-75 to 1992-96 (years)

States	1970-75	1976-80	1986-90	1991-95	1992-96	Increase in life expectancy in 1992-96 over 1970-75 period
Madhya Pradesh	47.2	49	53	54.7	55.2	8.0
Orissa	45.7	49.4	54.4	56.5	56.9	11.2
Uttar Pradesh	43	46.2	53.4	56.8	57.2	14.2
Bihar			54.9	59.3	59.4	-
Rajasthan	48.4	51.9	55.2	59.1	59.5	11.1
Andhra Pradesh	49.7	52.3	57.7	60.3	60.7	11.0
Gujarat	48.8	52.4	57.7	61	61.4	12.6
West Bengal			60.8	62.1	62.4	-
Karnataka	55.2	56.3	61.1	62.5	62.9	7.7
Tamil Nadu	49.6	53.4	60.5	63.3	63.7	14.1
Haryana	57.5	54.8	62.2	63.4	63.8	6.3
Maharashtra	53.8	56.3	62.6	64.8	65.2	11.4
Punjab	57.9	60.5	65.2	67.2	67.4	9.5
Kerala	62	65.5	69.5	72.9	73.1	11.1
INDIA	49.7	52.3	57.7	60.3	60.7	11

Source: Registrar General India (1999), *Compendium of India's Fertility and Mortality Indicators 1971-1997*, based on Sample Registration System, New Delhi, 1999

The current rise in life expectancy is attributed partly to the rise in the nutritional level and partly to the improvement in the health infrastructure in the state. As against four health centres per lakh population in 1966, there were 11 in 2000; as against three doctors per 10,000 population in 1966, there were 10 in 2000; and as against one midwife for 10,000 population in 1966; there were 10 in 2000. The average distance to a health centre was reduced to one-half, from six to three kilometres, during 1966-2000. As such, both availability and access to health services has significantly improved during the period under reference.

Figure 10
Average Radius Served per Health institution (kms.)

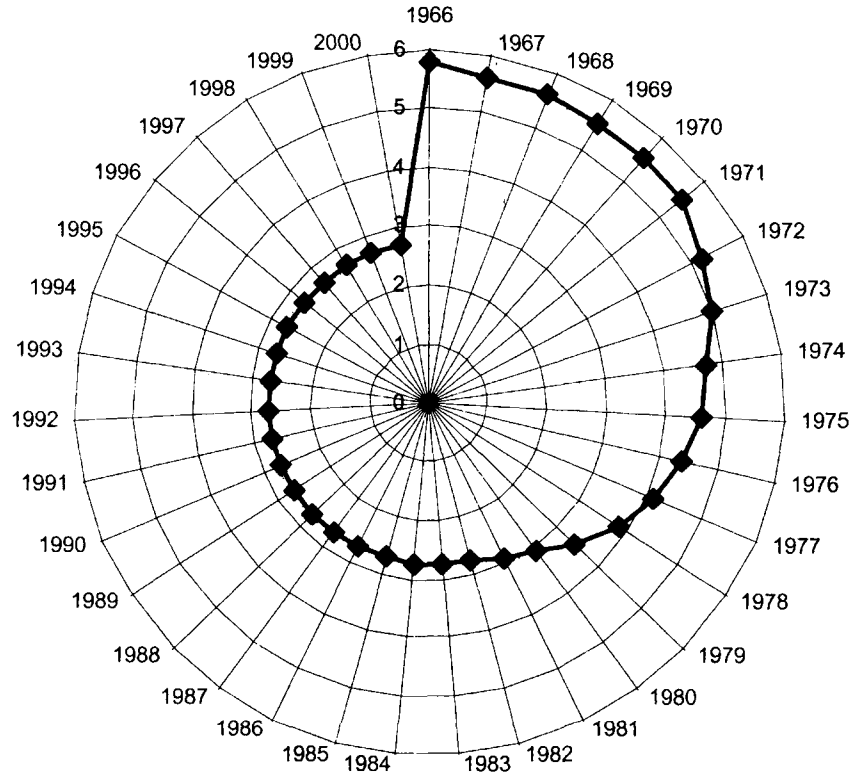
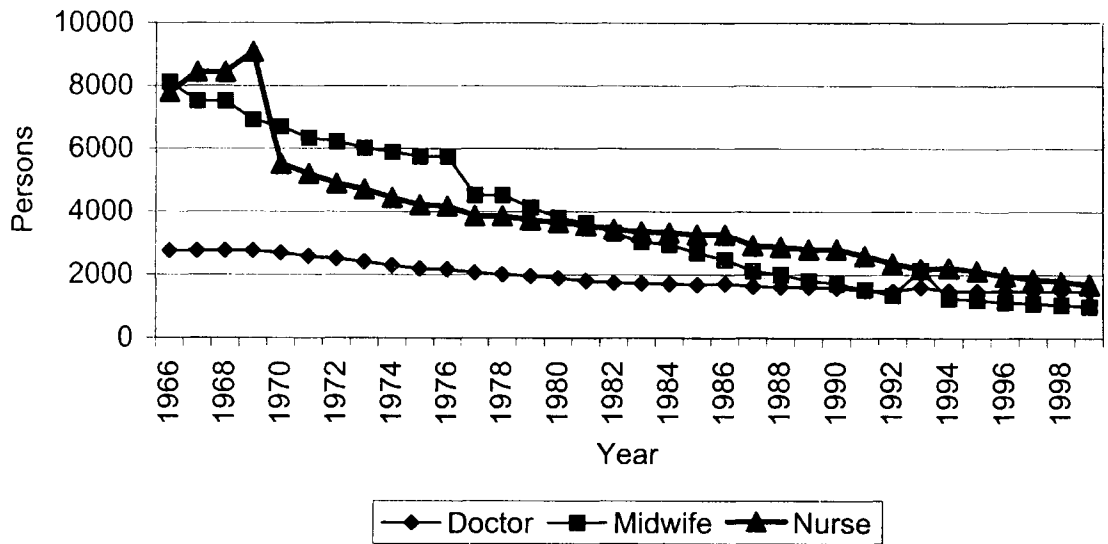


Figure 11
Population Served per Medical Personnel, Punjab 1966 to 1999

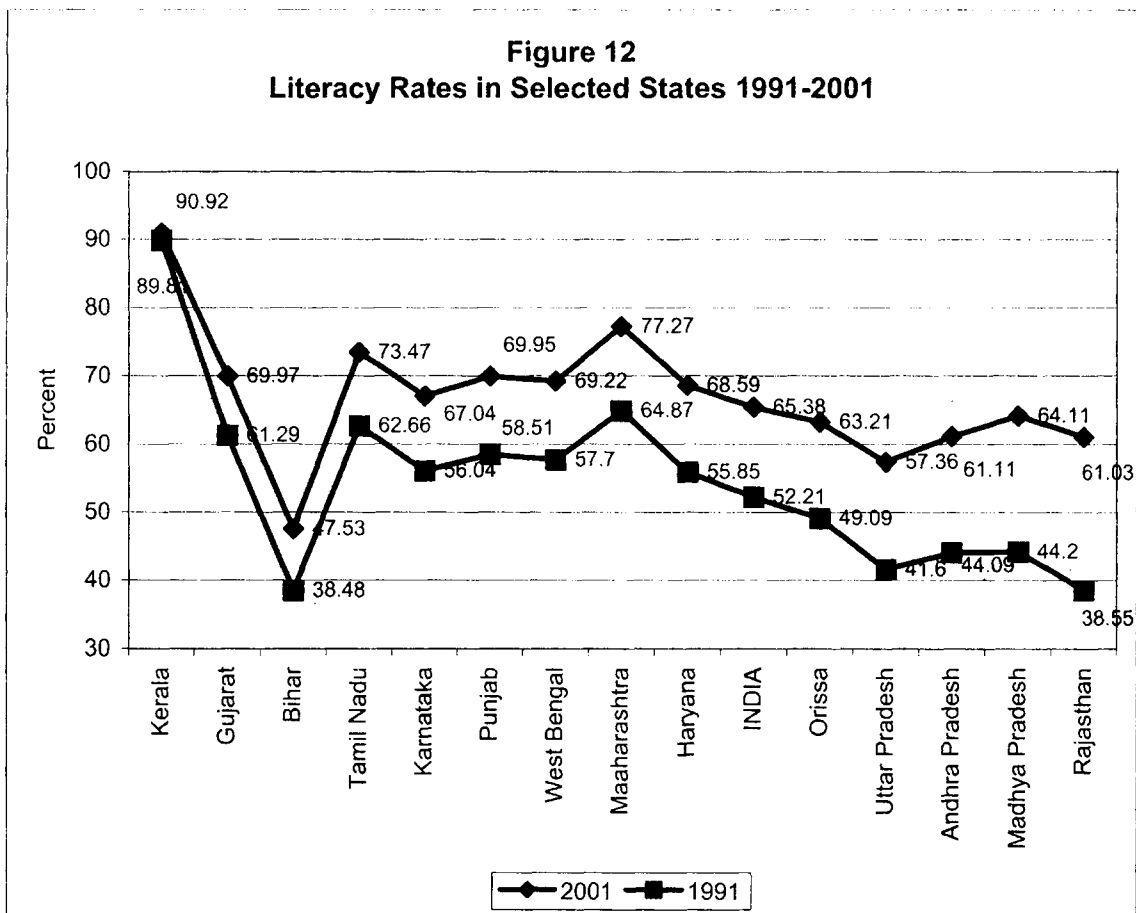


Source: Various issues of *Statistical Abstracts, Punjab*

Literacy: Educational attainments are not commensurate for a state enjoying one of the highest per capita incomes in the country,. Kerala has nine out of every ten persons as literate as compared to seven in Punjab in 2001. Among all the states and Union Territories, Punjab ranks 16th in literacy rate. Even though the literacy rate of the state improved by 11 per cent points from 59 per cent in 1991 to 70 per cent in 2001, it was of lower than the improvement at the national level from 52 to 65 per cent during 1991-2001.

Four out of every five persons in the urban areas of Punjab are literate and two out of every three in rural areas. Among urban areas, SAS Nagar, (Mohali, Rupnagar district) has the highest literacy rate of 92.5 per cent and Phillaur town (Jalandhar district) the lowest of 31.9 per cent. Hoshiarpur district (81.4%) is at the top in literacy, whereas Mansa district (52.5%) is at the bottom.

One redeeming feature of Punjab, however, is the relatively narrow gap in the literacy rates of males (75.6%) and females (63.5%), and urban (79.1%) and rural areas (65.2%), when compared with the all India picture. This is attributed primarily to a strong urban-rural interaction in the state, which has been promotive of literacy among females, and villages in a more effective manner.



Source: Census of India (2001): *Provisional Population Totals, Paper 1*, Directorate of Census Operations, Punjab

Sex ratio: Sex ratio in the Indian context is defined as the number of females per 1,000 males. It is one of the reliable indicators of the status of women in a society. Any prejudice against females may get manifest in their higher mortality rate through neglect, infanticide and even foeticide. The Punjab scene is not glorious in this context. With a sex ratio of only 874 in 2001 (Table 17), the state ranked 27th among the 28 states of India. This deficit of 126 females per 1,000 males is far in excess of the national average of 65, India's sex ratio being 933. In consonance with the relative status of females, the southern Indian states (Kerala 1058, Tamil Nadu 986 and Andhra Pradesh 977) are noted for a higher sex ratio than the northern Indian states (Haryana 861, Uttar Pradesh 898 and Bihar 921).

It is equally notable that while the sex ratio at the national level improved from 927 in 1991 to 933 in 2001, in Punjab it decreased from 882 to 874. More worrisome is the steep fall in the sex ratio in the 0-6 age group, from 873 in 1991 to 793 in 2001. The rising incidence of female foeticide explains this. This tendency is likely to continue and has serious long-term consequences.

Table 17
Variation in the Sex Ratio in Selected States during 1971-2001
(Females per 1,000 males)

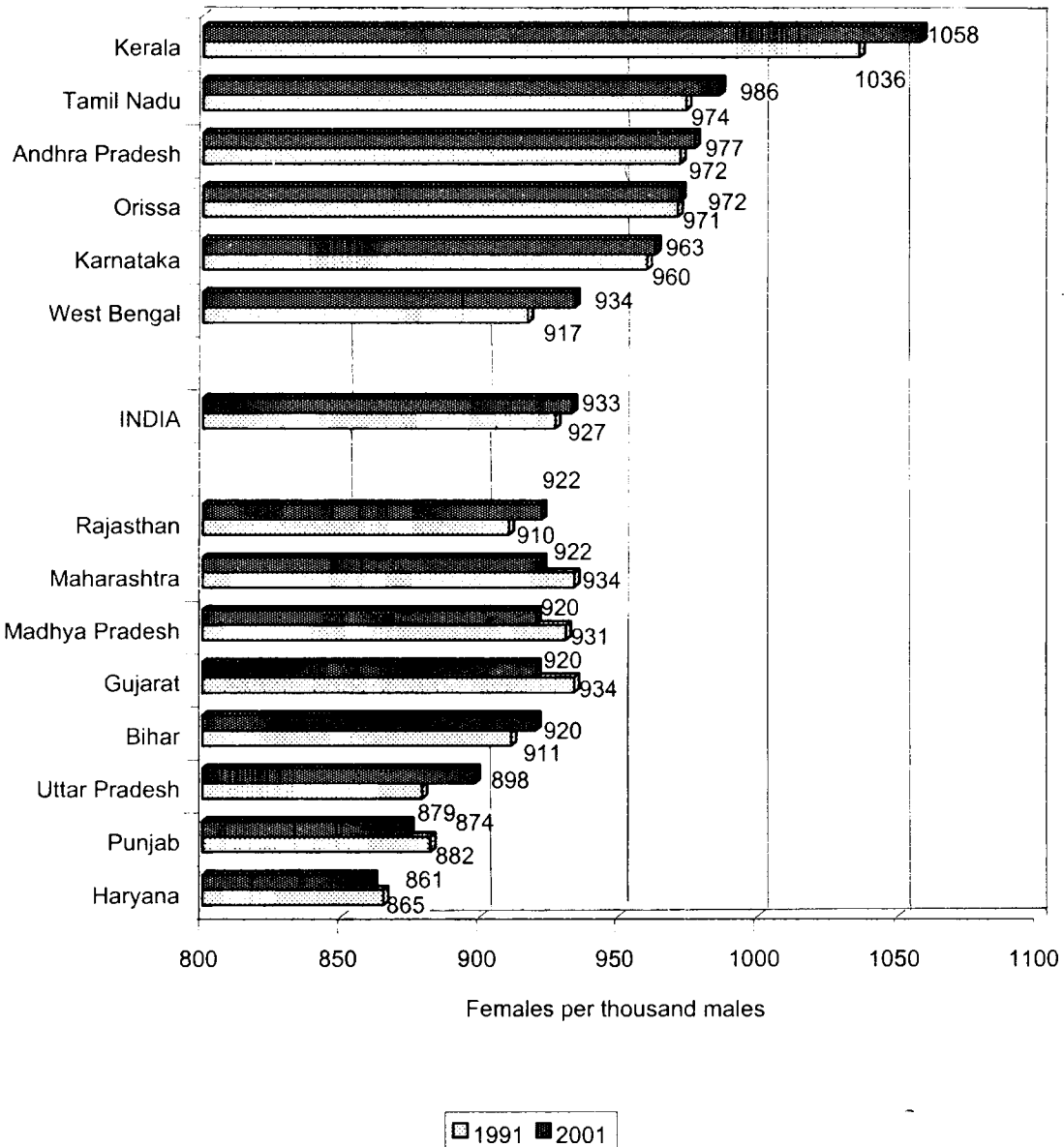
	1971	1981	1991	2001	Change in sex ratio during 1971 to 2001
Andhra Pradesh	977	975	972	977	0
Bihar	954	946	911	920	-34
Gujarat	934	942	934	920	-14
Haryana	867	870	865	861	-6
Karnataka	957	963	960	963	6
Kerala	1016	1032	1036	1058	42
Madhya Pradesh	941	941	931	920	-21
Maharashtra	930	937	934	922	-8
Orissa	988	981	971	972	-16
Punjab	865	879	882	874	9
Rajasthan	911	919	910	922	11
Tamil Nadu	978	977	974	986	8
Uttar Pradesh	879	885	879	898	19
West Bengal	891	911	917	934	43
INDIA	930	934	927	933	3

Source: Various volumes of Census of India

If the sex ratio in the 0-6 age group of all the 593 districts is taken into account, Fatehgarh Sahib district of Punjab has the distinction of having the lowest figure (754). The situation in Patiala (770), Gurdaspur (775), Kapurthala (775), Bathinda and Mansa (779 each) and Amritsar districts (783) is no better. The most telling commentary is that of then ten districts in India, noted for the lowest sex ratio in 0-6 age group, seven are in Punjab. There is something seriously wrong in the social sphere of this economically progressive state.

Figure 13

Sex Ratio in Selected States 1991-2001



Source: Census of India (2001): *Provisional Population Totals, Paper 1*, Directorate of Census Operations, Punjab

Economic well-being: In consonance with its higher per capita income of Rs. 14,676 than the national average Rs. 10,067 in 1999-00, Punjab is noted for a significantly higher per capita expenditure too. This is an expression of the higher level of economic well-being. The total consumption expenditure of a resident in Punjab is 1.4 times that of an average Indian, living in a village or town (Table 18). Within the state, the per capita expenditure in urban areas is 1.6 times of that in rural areas.

The consumption basket of an average villager and that of a town dweller displays some notable differences. While food accounts for 64 per cent of the expenditure for a villager, the comparative figure for an urban dweller is 45 per cent. The two are almost at par in terms of the percentage expenditure on fuel/light, and intoxicants. On the other hand, while the per capita expenditure on durable goods, rent and education is higher in urban areas, it tends to be higher in the case of health in rural areas. In addition, the people of Punjab spend significantly more on food, fuel/light, education and intoxicants than an average Indian.

Table 18
Average Monthly Expenditure (Rupees) per Person on Selected Group of Items of Consumption, 1999

Items	Punjab	Kerala	India
Rural			
Food	270.67	266.63	188.89
Non-food			
Fuel and light	36.64	24.70	21.67
Health	24.26	19.54	15.43
Clothing	14.03	29.83	21.78
Education	12.52	9.73	5
Intoxicants	6.18	3.82	2.32
Footwear	6.09	2.47	3
Rent	0.60	0.61	0.74
Durable goods	11.58	41.61	16.12
Miscellaneous	52.53	56.88	34.48
Non-food total	152.85	189.19	120.54
Total consumption expenditure	423.52	455.82	309.43
Urban			
Food	309.95	273.64	271.49
Non-food			
Fuel and Light	56.54	27.60	33.95
Health	19.49	20.98	17.56
Clothing	51.45	23.17	28.11
Education	32.32	12.45	20.54
Intoxicants	7.80	3.16	2.89
Footwear	14.52	3.55	4.91
Rent	33.25	3.48	21.76
Durable goods	37.82	9.59	22.89
Miscellaneous	117.41	59.3	83.97
Non-food total	370.60	163.28	236.58
Total consumption expenditure	680.55	436.92	508.07

Source: *Sarvekshna*, Vol. XXIII, No. 2, 81st Issue October-December, 1999

Despite the high level of economic well – being of the people, lack of adequate attention to parameters of human capital remain a matter of concern for future policy makers.

TASKS AHEAD

The state economy, which was growing at a faster pace than the national economy until the late seventies and was moving ahead almost at the same pace during the eighties, received a setback in the nineties. During the last decade, the annual growth rate of the state economy has been slower (4.7%) than that of the national economy (6.9%). In per capita income, Punjab held the top position at the beginning of the nineties among the major states, but came down to the fourth place by the end of the decade.

Taking a longer-term view, the share of the primary sector has decreased considerably, from 55.1 per cent in 1970-71 to 42 per cent during 1998-99; the share of the secondary sector on the other hand has increased from 18.1 per cent to 27.5 per cent, and the tertiary sector has recorded a marginal rise from 27 per cent to 30.5 per cent. As desired, the major share of expenditure during all the plan periods was reserved for irrigation and power, the critical factors for the development of agriculture and industry, respectively. The sad part is that the investment on these two has not given matching returns. There is an unbearable amount of subsidy involved in both. Among other factors, such a situation has led to a considerable decline in the share of development expenditure, from 72 per cent in 1980-81 to 46 per cent in 1998-1999. More in-depth analysis of the reasons for the slow growth of the state economy is necessary.

Agriculture in the state found a favourable environment in the extensive level-topography, sub-tropical continental climate, fertile soils, and favorable conditions of water supply through water bodies and irrigation. All this provided a favorable foundation for the green revolution. The state's remarkable success in agriculture created the base for rapid strides in other sectors of the economy. Today, however, the agricultural sector is passing through a crisis. Constraints in respect of a shift from the wheat-rice rotation to other crops and difficulties involved in the virtually static level of per hectare yield of rice and wheat are expressions of the crisis in this sector.

In this context, it is necessary to accelerate the pace of industrialization. Fortunately for the state, large/medium industries are picking up as also small-scale industry. This is not to say that industry is free from any problem. These are several, especially those relating to technology upgradation, marketing and foreign investment. These call for speedy resolution if particularly the challenge of rising unemployment among educated youth is to be met.

Punjab now needs to prioritize its requirements for making rapid strides. The foremost task ahead is to halt the decelerating rate of its economy. Its acceleration has to be achieved by the end of 10th plan. Agriculture, which is the base of Punjab's economy, is in a state of crisis. What is required is diversification not only of the cropping pattern but also of the agricultural economy towards non-farm activities. A stronger link between the agricultural and industrial sectors is imperative. This will also help in absorbing the growing size of labour and the unrelenting increase in the number of unemployed.

The new directions of economic development have to be accompanied by adequate attention to hitherto neglected areas of some of the critical parameters of human capital, including infant mortality, imbalanced sex ratio and not so standard reproductive health. There seems to be something seriously wrong in the otherwise economically progressive state. An upgradation of human capital is basic for ensuring sustained economic development of the state. Improvement in the quality of infrastructure, transport,

telecommunication, information technology and irrigation is a pre-requisite for achieving sustainable development. It follows that the twin challenge before Punjab by 2020 is higher economic growth and upgradation of human capital to ensure sustainable development.

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Table A
District-wise Area and Demographic Attributes, Punjab, 2001

District	Area (square kms.)	Total population	Sex ratio (females per thousand males)	Density (persons per square kms.)	Literacy (per cent)	Urban population (per cent)
Gurdaspur	3564	2096889	888	588	74.19	25.46
Amritsar	5096	3074207	874	603	67.85	40.00
Kapurthala	1632	752287	886	461	73.56	32.59
Jalandhar	2632	1953508	882	742	77.91	47.45
Hoshiarpur	3365	1478045	935	439	81.40	19.66
Nawanshahar	1267	586637	913	463	76.86	13.80
Rupnagar	2055	1110000	870	540	78.49	32.46
Fatehgarh Sahib	1180	539751	851	457	74.10	28.08
Ludhiana	3767	3030352	824	804	76.54	55.80
Moga	2216	886313	883	400	63.94	20.04
Firozpur	5303	1744753	883	329	61.42	25.81
Muktsar	2615	776702	886	297	58.67	25.52
Faridkot	1469	552466	881	376	63.34	33.89
Bathinda	3385	1181236	865	349	61.51	29.78
Mansa	2171	688630	875	317	52.50	20.68
Sangrur	5020	1998464	868	398	60.04	29.26
Patiala	3625	1839056	864	507	69.96	34.98
PUNJAB	50,362	24289296	874	482	69.95	33.95

Source : Census of India, *Provisional Population Totals, Paper-1 and 2 of 2001*, DCO, Punjab
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Table B
District-wise Decadal Variation of Population, Punjab, 1981-2001

District	Per cent Variation		Change in per cent points
	1981-91	1991-2001	
Gurdaspur	16.07	19.33	+3.26
Amritsar	14.46	22.72	+8.26
Kapurthala	18.60	16.34	-2.26
Jalandhar	17.30	18.40	+1.10
Hoshiarpur	16.39	13.81	-2.58
Nawanshahar	16.39	10.43	-5.96
Rupnagar	28.29	23.39	-4.90
Fatehgarh Sahib	17.01	18.65	+1.64
Ludhiana	36.53	24.79	-11.74
Moga	18.61	13.93	-4.68
Firozpur	24.00	20.42	-3.58
Muktsar	19.55	18.68	-0.87
Faridkot	22.79	21.42	-1.37
Bathinda	20.49	19.89	-0.60
Mansa	18.04	19.83	+1.79
Sangrur	21.36	18.57	-2.79
Patiala	21.53	20.31	-1.22
PUNJAB	20.81	19.76	-1.05

Source: Census of India, *Provisional Population Totals, Paper-1 of 2001*, DCO, Punjab

Table C
District-wise Share of Population to Total Population of the State,
1991 and 2001

District	Per cent to total population of the state	
	2001	1991
Amritsar	12.66	12.35
Ludhiana	12.48	11.97
Gurdaspur	8.63	8.66
Sangrur	8.23	8.31
Jalandhar	8.04	8.14
Patiala	7.57	7.54
Firozpur	7.18	7.14
Hoshiarpur	6.09	6.40
Bathinda	4.86	4.86
Rupnagar	4.57	4.44
Moga	3.65	3.84
Muktsar	3.20	3.23
Kapurthala	3.10	3.19
Mansa	2.83	2.83
Nawanshahr	2.42	2.62
Faridkot	2.27	2.24
Fatehgarh Sahib	2.22	2.24

Source: Census of India, *Provisional Population Totals, Paper-1 of 2001*, DCO, Punjab

Table D
District-wise Sex Ratio in 0-6 Age-group, Punjab, 1991 and 2001

District	Females per thousand males		Change in sex ratio during 1991 to 2001
	1991	2001	
Gurdaspur	878	775	-103
Amritsar	861	783	-78
Kapurthala	879	775	-104
Jalandhar	886	797	-89
Hoshiarpur	884	810	-74
Nawanshahar	900	810	-90
Rupnagar	884	791	-93
Fatehgarh Sahib	874	754	-120
Ludhiana	877	814	-63
Moga	867	819	-48
Firozpur	887	819	-68
Muktsar	858	807	-51
Faridkot	865	805	-60
Bathinda	860	779	-81
Mansa	873	779	-94
Sangrur	873	784	-89
Patiala	871	770	-101
PUNJAB	875	793	-82

Source: Census of India (2001): *Provisional Population Totals, Paper 1*, Directorate of Census Operations, Punjab

Chapter 2

DEVELOPMENT AND MANAGEMENT OF NATURAL RESOURCES

INTRODUCTION

inter-relationship and inter-dependence among water, land, vegetation and animal resources determine the nature and kind of livelihood support systems particularly in rural areas. Depletion of the natural resource-base and increasing biomass-demand of the expanding human and livestock population are attracting the attention of all concerned. However, the degeneration of natural resources is assuming alarming proportions. It is, therefore, pertinent to evolve strategies for sustainable natural-resource management systems. It is also imperative to observe the changes taking place in the land-use pattern in general and in the agricultural sector in particular, which will have implications for local bio-diversity and the ecosystem, and food and nutritional security of the local people.

Punjab is endowed with some forests, abundant water and fertile land resources, whereas its earth resources (mines, fossil fuel) are negligible. Agriculture is the mainstay of the state, wherein 42,64,000 hectare is the net sown area with a crop intensity of 186 per cent. Irrigation is through surface canal water as well as underground water pumped through tube wells, and over 94 per cent of the cultivated areas is irrigated. The state has an average rainfall of about 382 mm per year, whereas certain areas in the north of the state get over 1000 mm of rain and in the southern side rainfall is low (150-22 mm).

Punjab has a vast expanse of flat alluvial land while the Shivalik hills in the north have fluvial carvings and deposits of the three rivers, namely, the Ravi, Beas and Satluj, which flow through central Punjab, and the sand dunes in the southwest.

However, in recent years, due to the increase in population and other economic activities, scientists, intellectuals and the general public at large have expressed serious concern that both land and water resources have been overexploited, while their conservation has been slow and inadequate, so much so that there is fear that both land and water may become inadequate to support future development activities.

The natural resource of Punjab have been discussed under the following heads:

1. Land
2. Water
3. Forest
4. Wetlands, barren lands
5. Bio-diversity
6. Energy

LAND

Land is the fundamental base for most human and natural activities and one of the major natural resources on this planet. Production of minerals, as well as agriculture, depends

entirely on the availability and use of suitable land. In Punjab the following activities depend on land.

1. Agriculture
2. Water resource
3. Forest
4. Living species
5. Industry and Commerce
6. Transport
7. Pastures
8. Waste Land and uncultivated land
9. Miscellaneous

The extent of land utilisation usually depends on the type of soil in an area, e.g., loamy soils support agriculture, whereas sandy and rocky soils, which are not suitable for agriculture are usually put to some other use.

Table 1
Land-use Pattern in Punjab (.000 Hect.)

Area	1960-61	1970-71	1980-81	1990-91	1997-98 (R)	1998-99 (P)	1999-00 (P)	2000-01 (P)
Geographical area	5036	5036	5036	5036	5036	5036	5036	5036
Reported area	5022	5031	5033	5033	5033	5033	5033	5033
Forests	35	123	216	222	305	305	281	279
Barren and unculturable land	-	208	96	83	57	66	46	49
Land put to non-agricultural use	-	416	436	343	337	394	394	384
Culturable waste	-	83	41	35	37	29	20	14
Permanent pastures & other grazing land	-	5	4	10	4	10	6	4
Land under misc. trees, crops & grooves	-	4	4	12	5	13	5	5
Fallow land	313	139	45	110	49	43	38	34
Net area sown	3757	4053	4191	4218	4239	4173	4243	4264
Net area as percentage to total area	75	81	83	84	84	83	84	85
Area sown more than once	975	1625	2572	3284	3594	3567	3604	3671
Total cropped area	4732	5678	6763	7502	7833	7740	7847	7935

Source: *Statistical Abstract of Punjab, 2001*

Note : R: Revised, P: Provisional

The land resource of Punjab comprises of plains developed by alluvium – a material laid by the rivers under the influence of the climate and, in the north, the Shivalik hills which have undulating areas with rocky soil with heavy drainage. Punjab has about 4.2 million

hectare of land under agriculture. In addition, 6.0 per cent area is under forests. The remaining area is for human habitation, industry, roads and railways and other unmarked activities. Hence, there is little scope for bringing more area under cultivation. Table 1 shows changes in the land-use pattern in the state over the period 1960-61 to 2000-01.

The share of non-agricultural land is high in the north-eastern hilly parts and areas along various ravine belts. The share of agricultural land is gradually declining because of soil degradation due to intensive cultivation or to changing course of rivers and population pressure. About two million hectare is degraded land (Table 2).

Table 2
Extent of Degraded Land in Punjab

Waste-land/soil degradation	Area (lakh ha)
Water erosion	
(i) Severe (gullies, ravenous)	1.70
(ii) Slight & moderate (with/without scrubs)	3.40
Water-logged—rising water table	1.22
Marshy-submerged	2.28
Salt-affected (varying degrees of deterioration)	
(i) Canal command areas	3.93
(ii) Outside canal command areas	1.27
Degraded forest/pasture lands	2.00
Coarse/very light textured (loss of nutrients with deep percolation and leaching, poor in fertility)	6.20

Source: Director, Punjab Remote Sensing Centre, Ludhiana

Land Management

The state has been divided into three zones on the basis of soil- and water-management programmes. The northern zone is located in the foothills of the Shivaliks and extends from Derabassi block of Patiala district to Dhar block of Gurdaspur district, covering Ropar, Fatehgarh Sahib, Hoshiarpur and Gurdaspur districts. In these areas, soil erosion due to flash floods is very common. Terracing and leveling of undulating land is necessary to make some headway in developmental activities.

The central zone comprises of the districts of Patiala, Ludhiana, Jalandar, Nawanshahar, Kapurthala and Amritsar. Here, the land is level and there is extensive urbanization, industrialization and agricultural activity. In the agricultural areas, on the one hand alkaline/saline soils are increasing due to water logging and extensive use of underground water, while on the other, soil reclamation work is also going on. More and more land of the ravine beds, covered by the rivers Beas, Ravi and Satluj and their tributaries are being brought under cultivation. Sand scraping is also widespread around the river banks.

The southern zone comprises of the districts of Sangur, Bhatinda, Mansa, Muktsar, Moga, Faridkot and Ferozepur. Sand dunes are common in the southern most area, adjacent to Rajasthan. These are being reclaimed gradually to reach the good soil below for agricultural purposes. Sand scraping is also common. Since the underground water is brackish, the soils are getting sodic relatively fast and such areas are going out of

cultivation. Over 37,000 hectare of land has been reclaimed from gullies up to the year 2000. Maximum reclamation has taken place in the districts of Hoshiarpur followed by Ropar and Patiala, where land in each district has been brought under cultivation during the last two years (Table 3). The pace of land reclamation is slow and needs to be speeded up.

Table 3
District- wise Progress of Gully Reclamation Work on
Agricultural Land up to 1999-2000 (Hectare)

District	Up to 1997-98	During 1998-99	During 1999-2000	Total up to 1999-2000
Fatehgarh Sahib	-	-	-	-
Hoshiarpur	23711	-	-	23711
Gurdaspur	2677	-	-	2677
Jalandhar	97	-	-	97
Nawanshahar	-	-	-	-
Kapurthala	191	-	-	191
Amritsar	2	-	-	2
Ludhiana	-	-	-	-
Ropar	9290	64	-	9354
Patiala	1405	-	-	1405
Ferozepur	-	-	-	-
Sangrur	-	-	-	-
Bathinda	-	-	-	-
Mukarsar	-	-	-	-
Faridkot	-	-	-	-
Moga	-	-	-	-
Mansa	-	-	-	-
Total	37373	64	-	37437

Source: Annual Administrative Report, Department of Soil & Water Conservation, Punjab

Agricultural Land

Cropping intensity has been increasing since the green revolution and now it is 186 per cent. Wheat and paddy are the dominant crops of the Rabi and Kharif seasons respectively, occupying more than 60 per cent of the net cultivated area in each season. Both these crops are water and nutrient guzzlers. For paddy cultivation puddling of the soil is a prerequisite before transplanting. Repeated puddling leads to soil compaction, sub-division of soil particles and makes these soils impervious. Such soils in the long run become biologically inactive due to changes in the physico-chemical characteristics and thus are likely to become un-cultivable. The following important soil related constraints develop due to nutrient exhaustion of soils of macro- and micro-nutrients and intensive cultivation;

- *Chemical:* Depletion of organic matter; multi-nutrient deficiencies; nutrient imbalance; salinity/sodicity and pollution from agro-chemicals, sewerage and industrial affluent.

- *Physical:* Surface crusts; sub-soil compaction; soil erosion; poor air-water relationship; development of hard pan of fine textured sodic soils.
- *Biological:* Decline in quality and quantity of soil biomass; low biological oxidation and slow rate of decomposition of crop residues.
- *Hydrological:* Shallow water table; negative water balance; water logging; flood hazards; free percolation in coarse soils and poor permeability in fine textured soils.

At present, the organic carbon content has come down to 0.2 per cent from 0.5 per cent since 1960. The macro- and micro-nutrient deficiencies are dominant in 67 per cent of the cultivated area (Table 4). On top of it there are extensive areas where the soils are polluted due to waste-matter dumps containing degradable and non-degradable material, in and around urban areas. Extensive use of agro-chemicals on agricultural land reduce their biological activity, thus affecting the production potential of the soil, besides causing soil and water pollution.

Table 4
Percent Distribution of Blocks According to Fertility Status of Soils in Punjab
(on the basis of per cent deficient samples)

Fertility Status	1970-77			1981-90		
	N	P	K	N	P	K
Low	52	16	13	67	44	-
Medium	48	65	58	33	55	43
High	-	19	29	-	1	57

Source: Brar and Chhibba, 1994, Brar, 1979

Soil Conservation

There is excessive pressure on Punjab's lands, on the one hand due to intensive cultivation and on the other, due to population pressure, industrialization, water accumulation and other activities. Land resources are limited and very precious and have to be used with a view to its repeated utilization on a sustainable basis. Conservation of land thus assumes great importance. The present activity of the state Department of Soil and Water Management aims at transforming uncultivated land into cultivated land. There is very little scope for further increase in agricultural production by bringing more area under cultivation. Thus, various soil conservation measures, such as land development, water harvesting technology, water management, conservation irrigation, field drainage, improvement of handicapped areas, utilization of sullage water, improvement of sub-soiling, etc., are essential to obtain maximum returns from the limited and highly valuable material resource, i.e, land, for sustaining agricultural growth/productivity. During the Eighth Plan, 67,472 hectare has been treated under different soil and water conservation measures. It was targeted to cover an area of 1,13,700 hectare during the Ninth Plan (Table 5). The soil and water conservation programme was expected to generate 30.60 lakh mandays of employment during the Ninth Plan. However, little attempt has been made to stop or reduce the misuse of soil by making it biologically dead due to accumulation of industrial effluents, dumping of urban waste and natural soil erosion.

Table 5
Achievements of Soil and Water conservation Works during Plan Periods
(Hectare)

Item of Work	8 th Five Year Plan					9 th Five Year Plan (Target)
	1992-93	1993-94	1994-95	1995-96	1996-97	1997-02
Land development and ravine reclamation	2760	1247	1106	487	405	-
Rehabilitation of watershed	815	220	373	--	315	-
Water harvesting technology	330	--	468	910	1089	-
Water management	6682	380	850	1526	1504	-
Conservation measures	550	--	--	--	--	-
Field drainage	---	--	--	90	--	-
Improvement of subsoiling	213	146	65	62	--	-
Conservation Irrigation techniques	2886	1133	--	--	--	-
Improvement of handicapped areas	--	6071	7438	6858	7000	-
National watershed development	1169	--	2500	2385	1880	-
Tapping of sullage water	570	185	256	315	--	-
Drip Irrigation	--	--	--	314	325	-
River valley project	--	--	--	396	--	-
Flood Prone Rivers	--	--	--	1413	1805	-
Total	15975	9362	13056	14756	14323	113700

Source: Ninth Five-Year Plan of Punjab (1997-02)

Records do not reveal the amount of land area, which was once productive and has been going out of cultivation gradually. In addition, there may be small land patches distributed here and there owned by the farmers lying unused because these are uncultivable due to alkalinity or salinity. Similarly, in many paddy-growing farms some areas have become water logged where the second crop cannot be grown in the Rabi season. Such fragmented areas, which have become uncultivable have also to be brought under cultivation after proper reclamation through scientific advice to the farmers, who will adopt the reclamation practices faster as the area belongs to them.

In the northern Kandi region, soil erosion is a problem which needs to be tackled in a systematic and scientific manner, by terracing, planting of perennial grasses and trees, bunding, etc., in contiguous areas. The patchy work done here and there leads to more erosion of soils and washes away the terraces and bunds made in a season, which have to be reconstructed reportedly to be redone again. Only when this is done soil erosion can be checked on a sustainable basis in contiguous large area.

Conserving the natural land on a sustainable basis, particularly when it is fertile, is necessary in a situation when agricultural activity has to increase because of increase in population and an increasing demand for agricultural produce. Conservation and sustainability of land should go hand in hand so that these valuable assets remain of value.

In addition, soil salinity is on the increase in the southern region due to the use of brackish water for irrigation and in the central zone due to seepage and overuse of water. Strategies for improving the organic carbon status of the soil are also very important since it plays a multiple role in maintaining soil health.

Intensive research is needed to ameliorate the deteriorating condition of Punjab's soil and some of the known techniques, such as afforestation, water conservation, etc., should be properly disseminated to the stakeholders. For instance, large quantities of crop residues left in the field by the combined harvester can be recycled for improving the soil structure, decreasing bulk density and increasing porosity and infiltration of these soils in addition to supplementing nutrients. Several agronomic practices, such as raised beds, use of mulches, overhead plastic covers, etc., can greatly reduce environmental stress. Cultivation of crops with minimum tillage or zero tillage is becoming popular in this part of the country, because of the advantage of retaining organic carbon, besides lowering the cost of cultivation. This technique also needs to be continuously refined and evaluated through an inter-disciplinary approach to the cropping system.

In Punjab, an area of 6.98 lakh hectare was affected with alkalinity/salinity of the soil, which included 2.35 lakh hectare severely affected and 4.63 lakh hectare marginally or moderately affected. Out of the total of 6.98 lakh hectare, about 4.90 lakh hectare had been reclaimed up to 1996-97 (Table 6). Subsidized gypsum is supplied to all categories of farmers. *Dhancha* seeds with a limit of Rs. 300 per hectare are supplied free of cost.

These soils are either alkaline (with high pH), saline (with high salt content) or both alkaline and saline. The reclamation process of saline soils involves removal of excess soluble salts out of the root zone. In irrigated and well drained areas, like most of the central plain zone, soil salts are located and drained to suitable areas. Mulching has been found to increase the efficiency of leaching of salts. Alkali soils with high exchangeable sodium can be reclaimed by applying gypsum, press mud, etc. These scientific methods of soil reclamation, when adopted carefully, can minimize the problem and encourage productivity of several salt tolerant crops. Continuing research inputs are needed to improve technologies to manage such soils on a sustainable basis.

Steps taken by government agencies in vast areas which need reclamation from soil salinity or water logging are a slow process. This activity has to be quickened so that more area is brought under cultivation than that which goes out of cultivation.

Table 6
Reclamation of Alkaline/Kallar Land during the Plan Period in Punjab (Hect.)

Total area affected with alkalinity at the beginning of fifth plan	6,98,000
Level achieved upto 1979-80	73,547
Area reclaimed during sixth plan 1980-85	1,56,197
Total area reclaimed upto the end of sixth plan	2,29,744
Area reclaimed during seventh plan 1985-90	1,23,475
Total area reclaimed upto 1989-90	3,53,219
Achievements	
1990-91	21,323
1991-92	23,463
1992-93	18,210
1993-94	20,670
Eighth plan 1992-97	1,10,000
1994-95	19,000
1995-96	26,000
1996-97	22,400
1997-98 (Target)	20,000
Ninth Plan (Target)	1,00,000

Source: Ninth Five-Year Plan, Punjab (1997-02)

Outlays of Rs.1,250.00 lakh and Rs. 250.00 lakh have been made under the 50:50 sharing scheme for 'Reclamation of Alkali Soils' in the Ninth Plan and the Annual Plan for 1997-98 to reclaim 100,000 hectare and 20,000 hectare respectively. Allocations of Rs. 1,134.12 lakh and Rs.206.22 lakh have been provided in the Tenth Plan and the Annual Plan for 2002-03 respectively for reclaiming saline land.

Table 7
Expenditure on Soil Conservation Measures during Plan Period (Rs. in Lakhs)

Plan Period	Soil Conservation & Engg. Deptt.	Agriculture Department (Land Reclamation)	Total
Expenditure			
Eighth Plan			
1992-93	577.99	302.71	880.70
1993-94	582.36	264.28	846.64
1994-95	633.80	272.72	906.52
1995-96	582.36	264.28	846.64
1996-97	624.35	53.86	678.21
Outlay			
Ninth Plan	4175.00	1250.00	5425.00
1997-98	625.20	250.00	875.20

Source: Ninth Five-Year Plan, Punjab (1997-02)

The state government has been spending money on various soil conservation measures regularly in order to improve degraded land. Expenditure under the sub-head 'Soil Conservation' during the Eighth Five-Year Plan, i.e., 1992-93, 1993-94, 1994-95, 1995-96 and 1996-97 and approved outlay for the Ninth Plan and the Annual Plan for 1997-98 is given in Table 7. The total expenditure on soil conservation was Rs. 4,158.71 lakh

during the Eighth Plan. Out of an outlay of Rs 5,425.00 lakh provided in the Ninth Plan, only 35.8 per cent was spent on soil conservation during the plan period.

For water-logged soils, avoidance is the best prescription. Seepage from canal water and overuse of irrigation water for crops have to be checked to avoid water-logging. A proper drainage system has to be developed so that the flow of water is on a gradient to prevent accumulation in the first two to three metre depth of the soil. A project to develop a drainage system in the southern region of the state is under construction. However, a scientific drainage system needs to be refined and reinforced so that the water-logging problem is reduced and eventually eliminated. A mix of scientifically proven methods of minimizing and eliminating water-logging are:

- Planting of contour vegetative hedges particularly on higher slope areas.
- Repair bore-wells with pumping sets for vertical drainage.
- Shallow bore-well with pumping sets for vertical drainage.
- Percolation wells with pump sets.
- Deepening/renovation of village ponds and others.
- Dissemination of these methods to the farmers concerned can greatly help in checking water-logging.

WATER

Water is considered to be an inexhaustible natural resource in the world, but the quantum varies from place to place. Punjab, as the name suggests, is the land of rivers. It is endowed with a good surface water resource through rivers and streams and also has abundant underground water reservoirs. It is a conservative estimate that nearly 80 per cent of the water resources is consumed in the production of food and fibre. Agricultural water-management, therefore, assumes great significance. While surface-water management has been under governmental jurisdiction, underground water is mostly exploited on a private basis.

The use of water has been through an integrated approach on the basis of comprehensive research and investigations. In spite of this, there has been problems of fluctuating sub-soil water level losses and wastage of undeveloped and developed water courses and a general phenomenon of improper drainage. For Punjab, the rivers Sutlej, Ravi and Beas of the Indus basin and the rivers Yamuna and the Ganga basin originating in the Himalayas are the main sources of water for canal irrigation. Storage basins have been constructed over the river Sutlej-Bhakra Dam, on the river Beas-Beas Dam at Pong and on the river Ravi-Thein Dam, whereas for the river Yamuna, the storage dam (Kishau Dam) is yet to be completed. The rivers Sutlej, Beas and Ravi have been interlinked with the transfer of water from the Ravi to the Beas and from the Beas to the Sutlej – the Bhakra canal system and the Yamuna canal system are also interlinked to regulate the water flow. In other words, all the four rivers have been so interlinked that these can operate as a common grid, and this remarkable water management system is greatly responsible for progressive agriculture in the state, as it provides abundant surface water for irrigation.

Surface Water Resources

The three rivers, namely the Sutlej, Beas and Ravi, flowing through the state have a water potential of about 20.06 maf. Although some limitations are imposed by seasonal variations in the flow, large quantities of water are available for irrigation purposes. The river flow is considerably reduced from mid-November to mid-February and the subsequent rise in the level of water is dependent upon the rains. Besides these rivers, there is a network of six major canals, some built during British times and others later on. These are the Upperbari Doab Canal; Bist Doab Canal; Sirhind Canal; Patiala I.B. Circle; Bhakra Main Canal; and Ferozepur Canal Circle. In addition, there are several important water drains and nallahs, as mentioned earlier.

Punjab has a distribution network of 1.45 lakh km of canals including branch canals, and minor distributaries and one lakh km of field canals or water courses. The canal irrigation system irrigated about 1.3 million hectare of land in 1970-71, while only one million hectare was irrigated during 1999-2000 (Table 8). There has been a reduction of over 36 per cent in the canal irrigation area since 1990. This is because only 35-40 per cent of the water entering the canal system reaches the cultivated fields. Normally the optimum efficiency for canal irrigation is 60 per cent. Over the years, maintenance of the canal irrigation system has been neglected and overlooked. Mainly silting of canal beds, unlined channels and distributaries and leakage of bunds due to improper maintenance cause loss of water. Revamping the canal system, particularly by de-silting and lining of channels and distributaries, would generate enough water for the remaining unirrigated land of the state.

Incidentally, the quality of the canal water remains good for most part of the year, except during May and June when the electrical conductivity increases from an average of 400 to 500 moh/cm. The quality of water is also affected by the terrain through which passes it.

The canal irrigation system has also led to much wastage due to seepage. In most of the canals, which are unlined, constant seepage has led to water-logging in most of the command areas and also development of salinity in the soil. Unless the canals are properly cleaned and lined, the problem of water-logging and soil salinity will continue to aggravate and more and more land will become uncultivable. Urgent steps are needed to check the loss of land on account of controllable canal water flow.

Table 8
Net Irrigated Area (.000 ha.) by Different Sources in Punjab

Source	1970-71	1980-81	1990-91	1999-00*	2000-01*
Canals	1292	1430	1669	1051	1002
Tube wells	1591	1939	2233	2938	3017
Other sources	5	13	7	12	2
Total	2888	3382	3909	4001	4021
Share of area irrigated to the net area sown (%)	71	81	93	94	94

Source : *Statistical Abstract, Punjab 1971, 1981, 1991, 2000 and 2001*

Note : * Indicates provisional estimates

Groundwater Resources

Groundwater resources are exploited to supplement surface water resources. In Punjab, underground water resources have been exploited to such a large extent that the crisis of its depletion is becoming a reality. There are 9.35 lakh tube wells in the state to lift underground water for agricultural irrigation and another 1,50,000 in urban and semi urban areas for drinking water, industrial purposes, etc.

During 1970-71, there were only 1.92 lakh tube wells in the state. About 71 per cent crop areas were irrigated by tube wells during 1970-71, increasing to 95 per cent during 1999-2000. While canal irrigation has been declining over the years, tube well irrigation, particularly in the central and northern regions of the state, has been on the increase. The state has over 1.7 million hm of available groundwater potential. Due to over-exploitation of underground water reserves are getting exhausted, so much so that the water table has gone down by five to ten metres during 1973 to 1996 in the central plain zone. It has been estimated that the average decline of the water level is at the rate of 23 cm per year (Table 9). If this trend continues for the next 15 years, more than two lakh submersible pumps would be needed to replace the present pump sets, at an estimated cost of Rs. 2,000 crore meaning ~~by~~ **by** an extra expenditure of Rs. 5,000 per hectare of net sown area and in addition a ~~two~~ **two** fold increase in energy consumption.

Table 9
Rise and Fall in Underground Water Table in Different
Districts of Punjab, 1973 through 1994

District	Fall in water table (m)			Rise in water table (m)		
	Blocks	1973-83	1984-94	Saline/semi-saline blocks	1973-83	1984-94
Sub-mountainous Zone						
Gurdaspur	All	+0.2-0.6	-0.7-1.2	-	-	-
Ropar	All	+0.04	-1.8	-	-	-
Hoshiarpur	All	-0.9	-0.9	-	-	-
Central Plains						
Amritsar	All	-0.9	-2.3	-	-	-
Kapurthala	All	-0.7	-1.8	-	-	-
Jalandhar	All	-1.5	-2.5	-	-	-
Ludhiana	All	-0.9	-1.9	-	-	-
Patiala	All	-0.9	-1.9	-	-	-
Patiala	All	-1.17	-9.8	-	-	-
Fatehgarh Sahib	All	-1.3	-2.7	-	-	-
Sangrur	All	-5.1	-5.1	-	-	-
South-west Zone						
Mansa	All	-1.6	-1.4	-	-	-
Bhathinda	0.5	+3.5	-1.9	0.5	7.3	4.2
Faridkot	0.5	-1.15	-4.5	0.33	9.0	5.0
Ferozepur	0.75	+0.1	4.5	0.25	7.7	3.0

Source: Directorate of Water Resources, Punjab

According to a PAU estimate (1997) in 63 blocks of the state there is over-exploitation of water of more than 100 per cent of the annual net re-charge, whereas in seven blocks

the exploitation is above 85 per cent. This over-exploitation of underground water is due to the constant increase in the number of tube wells because of poor canal water supply, free electricity, cultivation of high water-consuming crops such as paddy, potato, wheat, sugarcane, fodder, etc., and scant attention to water-use efficiency. The phenomenon of over-exploitation of underground water resources is of concern in the other Indian states as well. During 1984-85 to 1998-99, the number of dark blocks has increased from 253 to 422 in the country. In Andhra Pradesh dark blocks have increased from 0 to 30, in Gujarat from 6 to 26, in Haryana from 31 to 51, and in Punjab from 61 to 97 (*Report, Planning Commission, 2001*). This calls for effective groundwater recharging measures and also regulation of groundwater resources. Extensive research is needed to work out methods of optimal water-use for different crops for different regions and also to improve the surface-water irrigation system.

In the southern region the groundwater is brackish, with high conductivity. Sweet water is found only in deep layers beyond 15 to 20 metres where submersible pumps have to be used. Being the southern and tail-end region of the canal system, both surface and underground water are scarce and hence this area has remained agriculturally less developed. Conjunctive use of sweet water, especially from canals with underground brackish water, has been in the practice for growing various crops in this region. But increase in soil salinity is a constant threat in these areas. Strong research input is needed to develop crop varieties for this area and to maximize the use of available water.

Watershed Management

In the sub-mountain Kandi region of the Shivalik range, soil erosion is rampant due to excessive water-flow during the rainy season and absence of water for drinking and irrigation in the rest of the year. Water conservation has been a need in this area. A watershed development project was initiated in 1990 with the assistance of the World Bank in this region. As a result of developing watersheds, contour vegetative barriers and vegetative reinforcements have been established in 6274 hectare and rain-water conservation has been possible for irrigating over 5000 hectare of land upto 1995. A total of 2094 villages fall in the Kandi tract, having a population of 14.17 lakh and 30,99,000 hectare of land belonging to the districts of Gurdaspur, Hoshiarpur, Nawanshahar, Ropar and Patiala. As a result of the development of watershed management, the yield of maize crop was 1746 kilogram per hectare, wheat 2098 kilogram per hectare and gram 79.4 kilogram per hectare during 1996-97. The cropping intensity has been 165 per cent. In the project area successful cultivation of crops, forests and grass has been possible, while in non-project areas the conditions are yet to improve. The participation of local people and government agencies have demonstrated that infertile and degraded areas can be conveniently converted into fertile and cultivable areas with their joint efforts and scientific acumen. Continuation of watershed management programmes in the remaining area is necessary for increasing crop productivity. Besides capturing rain, water-sheds can meet the growing demand for irrigation in lean periods. In addition, the basic approach should be to convert the surface flow of water to sub-surface flow for reaching open and groundwater aquifers.

Management of Water-use

Government-managed canal water system, which has a very scientific layout of distribution and delivery mechanism, is now facing criticality in its performance. While

the end user of the canal irrigation system is the biggest sufferer, the influential landlords take advantage of the weakness of the system and usurp the water which otherwise should have reached the tail-enders. By managing the canal system in a scientific manner, the remaining unirrigated area of the state can also receive water for cultivation. Presently more than 50 per cent of the canal water is wasted only because of seepage. This can be easily checked by well-developed scientific procedures.

Water-logging in the canal command areas and areas where the drainage is poor has been a cause of concern, as large areas have gone out of cultivation. Valuable experience has been gained from the management of water-logged areas in the Tikri project (Barabanki district, UP) of National Watershed Development Programmes for Rainfed Agriculture (NWDPR), where desilting of village ponds and vertical drainage through shallow tube wells have totally eliminated water-logging. In addition, fish culture in desilted ponds and summer cropping of okra, green gram and cucurbits irrigated from shallow tube wells are generating considerable income to the farmers. Such success stories should be emulated for action in the affected areas.

Over-exploitation of underground water needs to be checked and regulated so that only the amount of water required is pumped out and there is no wastage. Withdrawal of free electricity or introduction of partial tariff will reduce considerably the continuous running of tube wells and also check wastage of water. The recharge of underground water is an immediate necessity and concerted steps must be initiated now, failing which water scarcity will become a reality by the end of the next decade. In this context, rain-water harvesting, which is relatively an inexpensive technology, should be adopted on a large scale *both in urban and rural areas, with a focus on recharging the depleting* underground water and also using it for irrigation purposes. Administrative reforms are also required in the distribution of water and a campaign needs to be launched to sensitize people to save water. Panchayati Raj Institutions can greatly facilitate the task of water management at the village level.

Rain-water Harvesting

To recharge the depleting groundwater table, rain-water harvesting is necessary in urban as well as rural areas. The most prominent area where rain-water harvesting can be done is the Kandi area, or the lower Shivaliks where there are a number of choes. The main method recommended for preventing soil erosion is through check dams. Apart from the check dams, sink holes should be made where the soil is impervious. Sink holes have to be located upstream of the check dams where water has been stored. This area serves also as aquifers of the water table of Punjab in general. The design of these sink holes should be such that they can be cleaned annually. Check dams and sink hole combination not only controls soil erosion, but also checks flash floods in these areas.

Rain-water harvesting in inhabited areas: There are many other ways, though at the micro level, to enhance rain-water harvesting. The most prominent and useful method is rooftop rain-water harvesting. Many states, such as Andhra Pradesh and now Haryana have also made it mandatory for every house, of plot-size 250 sq. yards and more, to have its own rain-water harvesting system. In areas having smaller plot size, and even rural settlements, rain-water harvesting pits can be made at the community level.

A typical rooftop rain-water harvesting system comprises of

- a) Roof catchment
- b) Gutters
- c) Downpipes
- d) Rain-water/storm-water drains
- e) Filter chamber
- f) Ground water recharge structures, like pit, trench, tube well or a combination of the above structures.

Storage tanks: For harvesting roof top rain-water, storage tanks may be used. These tanks may be constructed on the surface as well as underground by utilizing local material. The size of the tank depends upon the availability of run-off and water demand. After proper chlorination, the stored water may be used for drinking purposes.

Recharge pits: Recharge pits are constructed for recharging shallow aquifers. These are constructed 1 to 2 m. wide and 2 to 3 m. deep back and filled with boulders, gravels and coarse sand. The size of filter material is generally as below:

Coarse sand : 1.5 - 2 mm

Gravels : 5 - 10 mm

Boulders : 5 - 20 cm

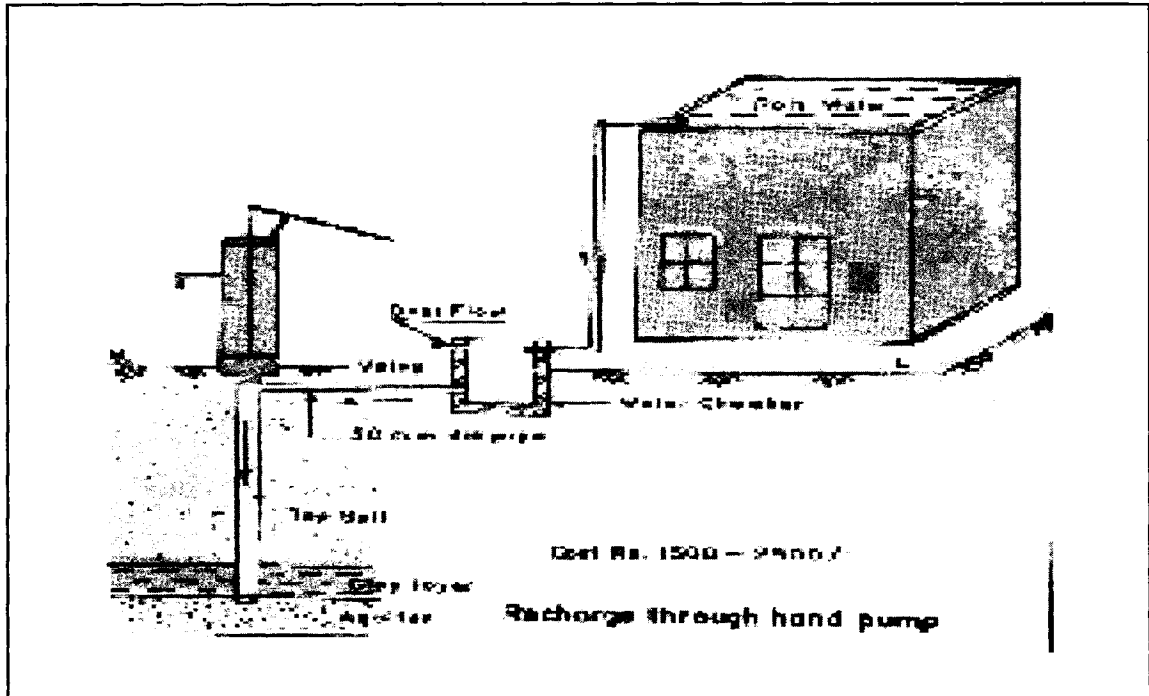
The filter material should be filled in graded form. Boulders at the bottom, gravels in between and coarse sand at the top so that the silt content that will come with the runoff will be deposited on the top of the coarse sand layer and can easily be removed. If clay layer is encountered at shallow depths, it should be punctured with auger hole and this should be refilled with fine gravel of 3 to 6 mm size.

Trenches: These are constructed when permeable strata are available at shallow depths. The trench may be 0.5 to 1 m. wide, 1 to 1.5 m. deep and 10 to 20 m. long, depending upon the availability of water. These are back-filled with filter materials. In case clay layer is encountered at shallow depth, auger holes may be constructed and back-filled with fine gravel.

Abandoned dug wells: Existing abandoned dug wells may be utilized as recharge structures after cleaning and desilting them. For removing the silt content, the run-off water should pass either through a desilting chamber or a filter chamber.

Abandoned hand pumps: The existing abandoned hand pumps may be used for recharging shallow/deep aquifers, if the availability of water is limited. Water should pass through the filter media before being diverted into hand pumps.

Abandoned tube wells: Abandoned tube wells may be used for recharging shallow/deep aquifers. These tube wells should be redeveloped before use as recharge structures. Water should pass through the filter media before it is diverted into recharge tube wells.



Recharge wells: Recharge wells of 100 to 300 mm. diameter are generally constructed for recharging the deeper aquifers and rooftop rain-water is diverted to recharge well for recharge to groundwater. The runoff water may be passed through filter media to avoid choking of recharge wells.

Vertical recharge shafts: For recharging shallow aquifers which are located below clayey surface at a depth of about 10 to 15 m, recharge shafts of 0.5 to 3 m diameter and 10 to 15 m deep are constructed, depending upon the availability of run-off. These are back-filled with boulders, gravels and coarse sand. For lesser diameter shafts, the reverse/direct rotary rigs are used and larger diameter shafts may be dug manually. In the upper portion of 1 or 2 m depth, brick masonry work is carried out for the stability of the structure.

Shaft with recharge well: If the aquifer is available at a greater depth, say 20 or 30 m, a shallow shaft of 2 to 5 m diameter and 5 to 6 m deep may be constructed, depending upon the availability of run-off. Inside the shaft, a recharge well of 100 to 300 mm diameter is constructed for recharging the available water to a deeper aquifer. At the bottom of the shaft filter media are provided to avoid choking of the recharge well.

Lateral trench with bore wells: For recharging the upper as well as deeper aquifers, lateral trench 1.5 to 3 m wide and 10 to 30 m long, depending on the availability of water, with one or more bore wells may be constructed. The lateral trench is back-filled with boulders, gravels and coarse sand.

Agricultural Land

Apart from rooftop rain-harvesting, the agricultural sector should also be encouraged to use different forms of irrigation other than flood irrigation, where much of the water is evaporated. Drip irrigation and sprinkle irrigation should be made compulsory for the

consumption of less water. Even field boundaries should be made higher, at least 2.5-3 ft for checking outflow of water. This could be checked by revenue authorities or patwaris in the villages.

Drain Management

Drains, which are spread almost all over Punjab, may be used effectively for rain-water harvesting. There should be a strict ban on the dumping of city sewage in these drains, whereas check dams must be constructed along with flood gates near waste land. Drains, constructed for the flow of excess surface rain water, must be made to carry this type of water only. Those drains which carry water from agricultural fields containing fertilizers, pesticides, etc., must be used again for irrigation of agricultural fields alone.

FORESTS

Punjab is a predominantly an agricultural state, consequently the forests cover is low. According to the state's Forests Department, approximately about six per cent of the land area is recorded under forests against the norm of 33 per cent prescribed in the National Forest Policy.

Table 10
Forest Cover in India and Punjab (2000)

	India	Punjab
Recorded forest area	75 m ha (54% Reserve forests) (30% Protected forests)	2.90 lakh ha (5.8%)
Actual forest cover	64 m ha (19% of total geographical area)	1.39 lakh ha (2.8% of area)
Well stocked forests (Cover density > 40%)	(12% of total geographical area) 38 m ha	51.00 ha (1.0%)
Degraded forests	31m ha (40% of recorded forest area)	12,000 ha (0.23%)
Average productivity	$1\text{m}^3\text{/ha}$ (Potential is: Rainfed: 25-35 m ha irrigated 40-50 m ³ /ha)	-
Growing stock	@ 65m ³ /ha (110m ³ /ha world average)	-

Source: *Statistical Abstracts*, Punjab, 2000-2001

The actual forest cover is 2.8 per cent (Table 10). The types of forests in Punjab are given in Table 11. There is hardly any scope to transfer more areas to the Forest Department for raising forests plantation. Out of the total of 1,387 sq. km. land under forest cover during 1997-98, the Shivalik Circle, constituting the districts of Hoshiarpur and Ropar, has the highest area (1,82,907 hectare) followed by the Bist Circle (80,217 hectare) and the South Circle (41,405 hectare). Hoshiarpur and Nawanshahar districts have the maximum land under forest cover. Per capita forest in Punjab is 0.01 hectare as compared to the Indian average of 0.07 hectare (Table 12).

Table 11
Forests of Punjab

Types of Forests	1997-98 (ha)	1998-99 (ha)
A) GOVERNMENT FORESTS		
1. Reserve forests	4336.36	4336.39
2. Protected forests		
i) Demarcated forests	29842.36	29988.38
ii) Un-demarcated forests	7970.05	7970.05
iii) Road strips	16511.17	16524.17
iv) Rail strips	8723.19	8723.19
v) Canal/Drain strips	45024.74	45034.24
Total Protected forests	108071.53	108240.03
3. Unclassed forests	21522.54	21377.34
Total Govt. forests	133930.46	133953.75
B) PRIVATE FORESTS		
4. Under sec. 4 & 5 of Punjab Land Preservation Act, 1900	169899.60	169899.60
5. Under Sec. 38 of Indian Forest Act. 1927	675.33	675.33
Total Private Forest	170574.93	170574.93
Grand Total	304505.39	304528.69

Source: Annual Administrative Report, 1998-99, Forest & Wildlife Preservation, Punjab

The function of forests is merely to provide timber, food, fibre and fuel wood. These have a great influence on the environment, the soil, water and, above all, these are the custodians of bio-diversity and wildlife. The survival of all these elements on a sustainable basis is necessary, but the current situation is such that the conservation of existing forests is so urgent that expansion is a far cry. In contrast, however, degradation of forests for economic reasons and extensive poaching of wildlife has been going on unabated, despite the fact that several forests areas have been declared as reserves for wildlife and felling trees is banned. In Punjab, 8,064 cases of illegal felling of trees and poaching of animals were registered during 1997-98, in addition to several hundreds of unreported cases. Management of forests, therefore, assumes great significance.

Table 12
Forest Cover in Punjab and Other States (1997-98)

State	Geographic area (sq km)	Forest area (sq km)	Forest as % to total area	Per capita (ha)
Punjab	50362	1387	2.8	0.01
Haryana	44212	604	1.4	-
Rajasthan	342239	13353	4.0	0.03
Gujarat	196024	12578	6.4	0.03
Arunachal Pradesh	83743	68602	82.0	7.93
India	3287263	633397	19.3	0.07

Source: Statistical Outline of India, 2000-01

Forests of Punjab have been classified as under:

- a) Coniferous (Lower Shivalik Chir Pine) forests
- b) Bamboo forests
- c) Scrub forests
- d) Broad leaf forests

Coniferous forests: These forests are found in the Shivalik hills of the state where Chir is the main species, along with Amla, Khair, Sunan and some scattered trees of Terminalias. Chir wood is of poor quality and its felling in the area is completely banned. These areas are being managed according to the tree section of the working plan, i.e., by a selection-cum-improvement felling system.

Bamboo forests: These forests are also found in the Shivalik hills, mainly in the Dasuya Forest Division and in certain pockets of Hoshiarpur and Gurdaspur Forest Divisions in Dholbaha and Salidhar forests respectively. In the Dasuya Forest Division, Bindravan, Karanpur and Nanad Bir areas are almost pure bamboo forests. The main species is *Dendrocalamus strictus* associated with Rajain, Khair, etc. These forests are being managed under selection-cum-improvement felling system.

Scrub forests: Scrub forests are found in the Shivalik hills and in various Biris of Punjab. *Acacia catechu* is the main species found here. *Acacia nilotica* and *Delbergia sissoo* are found along riverine areas and in the plains. In the Shivaliks, management of these forests is under the Land Preservation Act of 1900 and under the Indian Forest Act of 1927, whose main objective is to stop and reverse the process of soil erosion and improve the moisture regime and groundwater recharging. In the past few years, economically more important tree species have been introduced in these scrub forests, both in the hills and in the plains. These include Eucalyptus, Neem, Siris, Toot, Drek, Ailanthus, Tun, Amla, Poplar, etc. In the plains, the Eucalyptus areas are under clear felling with regeneration. Improvement in felling, thinning and other silvicultural operations are also conducted as and when required. The techniques of management have great scope for improvement.

Broad leaf forests: Eucalyptus, Shisham, Poplar, Mango, Neem, Toot, Teak, Ailanthus and Tun are some of the important species of the broad leaf forests. These types of forests are mainly found in the plains and are being managed under the prescriptions given in the working plans. Generally, the silvicultural system adopted is clear felling with artificial regeneration. The Eucalyptus forests are under the clear felling system with natural regeneration (coppice), supplemented by artificial regeneration. Improvements in felling, thinning and other silvicultural operations are also carried out as and when required.

Regeneration and Afforestation

Regeneration becomes essential as more and more forests get destroyed due to economic reasons, negligence, fires and other known and unknown causes. It has to be conducted at a faster pace than that of degradation, which now appears to be faster. Punjab has much less area under forests than prescribed, hence forest regeneration assumes great significance, for which concerted practical and scientific approaches have to be adopted. The current methods of forest regeneration are:

Mainly natural: Locational factors are very important in the natural regeneration of any forest species. Natural regeneration of Khair, Chil, Shisham, Eucalyptus and Bamboos has been going on in the forests of the state. Natural regeneration of Shisham is being encouraged in the Shivalik hills, as it helps soil conservation. At some places in the plains of Punjab good natural regeneration of Shisham has been noticed. Eucalyptus regenerates naturally through coppice. Natural regeneration is not the only way of afforestation but has also to be supplemented with artificial regeneration.

Mainly artificial: Afforestation with artificial regeneration is the main method adopted to increase the forest cover of the state. Plants of economically important species, viz., Eucalyptus, Khair, Bamboo, Teak and Shisham are raised in polythene bags in different nurseries of the state. At present there are 273 forest nurseries, covering an area of 263.49 hectare, which raise the seedlings of those tree species, which are planted when required for the artificial regeneration of the forests. The number of nurseries and seedlings need to be increased two-to three-folds to augment the forest cover in the state.

Afforestation: During 1998-99, afforestation/treatment was carried out over an area of 10,439 ha by the department under different schemes in operation. Apart from this, individuals and various organizations also carried out afforestation/treatment after purchasing the plants from forest nurseries and other private nurseries of the state. Voluntary bodies and village panchayats should be involved in this work.

Forest Produce and Requirement

Forests are also a natural source for wood, wood products, fruits, biodiversity and provide pasture land for grazing animals. Many communities thrive on forest produce, as this is their only means of livelihood and sustenance. In the process, damage to the forests and pasture lands takes place. However, some of the communities using forest produce are equally responsible for the maintenance of these forests, as they also ensure proper protection and regular regeneration exercises.

Overexploitation of forests for their produce for economic gains has endangered them and is the main cause of their degradation. The forest department is charged with the responsibility of preservation, management and regeneration of forests as well as wild life, but degradation of forests and poaching of wild animals go on unabated. Scientific methods need to be adopted for the sustainability of forests and wild life, and peoples' participation in this task should be ensured for better results.

Table 13
Forest Produce in Punjab

Particulars	Unit	1997-98	1998-99
Timber	Cu.M	73182	67760
Firewood	-do-	2070	2187
Bhabbar grass	Tonne	493	494
Fodder/grazing Sarkanda	Lakh Rs.	24.72	21.98
Plants	Lakh Rs.	50.31	40.93

Source: *Annual Administration Report, 1998-99, Forest & Wildlife Preservation, Punjab*

During 1998-99, 67,700 cubic metre of timber was legally produced by the forest department and 2,187 cu.m was meant for fuelwood. Non-wood forest produce, such as babbar grass, bamboo, sarkanda, fodder and fruits, valued at over Rs. 100 lakh, was also produced and sold (Table 13). This production is variable depending on weather conditions, market demand and the availability of forest produce. The projected annual total demand for wood in the state by the year 2005 is approximately 7.24 million cum. There are 88 plyboard manufacturing units in Punjab whose annual demand is met by trees harvested from 6,000 to 8,000 hectare of land annually. These units are working at 50 per cent capacity. On a six to seven year rotation the area under poplar tree cultivation can be easily increased by about one lakh hectare. Installation of pulp units for paper/rayon in public or private sectors is necessary, and this activity itself will encourage afforestation.

Agro-forestry and Social Forestry

Agro-forestry involves growing trees and crops in combination, while social forestry deals with growing trees in the socially inhabited areas, such as towns, villages, roads, parks, railway tracks etc. Punjab Agriculture University (PAU), after years of research, has identified tree species of Poplar, Eucalyptus, Leucaena, Acacia, Melia, etc., for agro-forestry and developed matching technology for their block and boundary plantation. For boundary plantation, planting of Eucalyptus in the north-south direction and its specific management of crop nutrients and water management have been standardized. Guinea grass, oats and sorghum have been identified as suitable crops for block plantation. Keeping in view the demand for several plywood units in the state, considerable emphasis has been laid on Poplar plantation. Cultivation of fodder crops, as inter-crop in the early stages at Poplar plantation has been found to be profitable and better than wheat-paddy rotation (Table 14).

Table 14
Economics of Poplar with Inter-cropping
(Annual value Rs./ha)

Year	Poplar+Wheat -Kh. Fodder	Poplar+Sugarcane for three years Wheat-Kh fodder for three years	Poplar+Potato+ fodder for three years Wheat-kh. fodder for three years	Paddy- Wheat
I	16778	27385	36498	33023
II	12095	30190	12098	33023
III	5925	16228	11143	33023
IV	43293	45450	45685	33023
V	44580	52658	53683	33023
VI	60435	67603	67813	33023
Overall	183106	239514	226118	198138
Annual	30518	39919	37686	33023

Source: Singh, Sukhjinder (2000) M.Sc. Thesis, Department of Economics & Sociology. Punjab Agricultural University, Ludhiana (Unpublished).

Usually farmers cannot spare or tie up the land for longer periods under block forests-tree plantation. Boundary plantation of Poplar, Eucalyptus, Drake, etc., planted in the north-south direction has given better results than when planted in the east-west direction. Marshy and marginal land are more suitable for Eucalyptus cultivation. Trees

planted around farm tube wells alongside farm paths and permanent water channels also add to agro-forestry and do not affect agricultural crops.

Cultivation of Eucalyptus was popular in the state during the eighties. Its cultivation declined due to lack of proper marketing and the agro-forestry movement suffered a setback. A second push for encouraging agro-forestry and social forestry is called for with adequate research backing.

Forest Management

Forest management is the crucial input for saving the forests, their bio-diversity and wildlife, from losses due to illegal felling of trees and poaching of wildlife. Besides, vigil has to be kept to detect forest fires. There are roads and paths passing through the forests and some rest houses have also been constructed. These have to be properly maintained. Protection from cattle on open grazing has to be ensured so that the rejuvenation of trees' undercover is not damaged beyond repair. Several trading operations, such as improvement in felling, Kana/gram stubbing, weeding, debudding, have to be carried out frequently to maintain the health of forest cover. While the wood of Poplar is in great demand there is also need for diversification to grow Teak, Simbal, Bamboo, Shisham, etc., for greater economic returns. Though adequate manpower has been assigned to the forest department, leakages are frequent and sometimes over-burdening.

Afforestation is a process of planting trees and other plant species on a regular basis to maintain appropriate forest cover and increase the forest area. In special area programmes, such as the sub-mountainous zone of Kandi area in the districts of Hoshiarpur, Ropar and Gurdaspur, afforestation is aimed at checking soil erosion and conserving water. An integrated afforestation programme with suitable tree species, grasses and other plants, to rejuvenate and add to the forest area and also to avoid the loss of bio-diversity, for ecological restoration and environmental conservation is on. Since 1997, this programme has covered over 1000 hectares in the Kandi area. The speed with which this work is being done is rather slow because degradation of forests is taking place faster than afforestation. In this context, participation of local stakeholders would be meaningful in not only saving the forests from degradation but also in looking after the planted trees. Involvement of Panchayati Raj Institutions would be meaningful.

Bio-diversity and its Conservation

In India about 45,000 plant species have been recorded, which constitute nearly 12 per cent of the world's total plant species. Out of these 3,000 species are of non-economic value. Many plant species found in the Himalayas and Shivalik ranges are locally used for various medicinal, food and fibre purposes. The medicinal value of some plant species is yet to be determined.

Bio-diversity: Punjab is almost entirely cultivated. The Shivalik in the north and northeast has undulating green forest cover where the maximum wild stock of the state exists. Along with the Shivaliks the wet-lands or patches along rivers are places where wild stock is available. The state can be divided into four main zones as follows:

1. Shivaliks
2. Grassy plains
3. Semi-arid region
4. Wet-lands

Shivaliks: The Shivalik forests are dominated by deciduous and broad-leaves bushes and trees. Quite a number of herbs and shrubs are also found in this region, especially during the rainy season. The lower hills have Shisham and Khair trees. The broad-leaves bushes and trees include Aohatoda, Azadirachta, Bombax, Butea, Albergia, Albizzia, Ficus, etc.. A large number of herbs form part of the ground flora. Thorny bushes and trees include Capparis, Ziziphus, Acacia, Mimosa, Lantana, etc.

The area also provide shelter to a large number of animals, birds, reptiles and insects. The ecosystem is of the climax type. The area has a large number of birds, especially sparrows, finches, weavers, woodpeckers, doves, pigeons, quails, cuckoos, magpie, parakeets, mynahs, etc. Such animals as deer, bluebull, sambhar, hogdeer, chital, etc., are found here, though in very small numbers.

Grassy plains: The grassy plains exist between the Shivaiiks and the sandy southern fringes of Punjab. Most of the area is cultivated, dotted by numerous trees and shrubs. Grasses are the dominant natural vegetation. The fauna include several herbivores, such as hares, squirrels, etc., and carnivores, such as cats, foxes, mangoose, snakes, etc. Birds, which mainly feed on insects and grains are to be found in this area.

Semi-arid region: The southern areas of Punjab were characterized by shifting sand dunes, about half a century ago. However, with increasing cultivation and availability of irrigation facilities, the sandy regions have shrunk considerably. Since humidity is very low, thorny bushes are the main flora. Reptiles, such as lizards and snakes comprise the main fauna of the area. Other animals include hares, jackals, squirrels, etc. Black buck and blue bull are found in Abohar sanctuary, protected by local inhabitants.

Wet-lands: Punjab has several inland fresh water reservoirs, such as ponds, lakes and rivers, which provide habitat to a variety of flora and fauna. Aquatic vegetation, such as water hycanith, nelumbium, trapa, hydrilla, etc., exixts in abundance in water bodies, along with varieties of algae and petridophytes, which feed large numbers of amphibians and reptiles, such as snakes, turtles, etc., and 116 species of fish have also been recorded in the water bodies of Punjab. They also attract a large number of migratory birds.

The state of bio-diversity in Punjab is not ecologically sound because of many reasons, such as:

1. The green revolution, which has resulted in food stability, is also responsible for changes in the ecosystem and loss of bio-diversity.
2. The narrow spectrum of traded products from agriculture, forestry and fisheries has resulted in the promotion of a few species only to the neglect of all other varieties.
3. Habitat loss has taken place due to micro-climatic change resulting from extensive land-use changes.
4. There is further loss of bio-diversity, as it has not been evaluated properly and integrated into the management of the resources.
5. Legal provisions are there to check poaching, extensive fishing, deforestation, but implementation is lacking, as well as awareness among the people residing in the neighbourhood.

The Punjab foothills of the Shivaliks, which once supported dense vegetation of diverse plant species, now present a highly degraded look. Perhaps many plant species have become extinct in this area. With the passage of time, depletion of agro-bio-diversity has also been taking place because of changes in the system of agriculture and in traditional crops and varieties in favour of new ones, over-grazing and deforestation. Encroachment for urban habitation, industries and other developmental activities have also caused considerable damage to plant species. Effects of such erosion of bio-physical and ecological systems are now being felt and will be felt more in the future. As there are no bylaws for adequate control, or powers to check unrestricted destruction of plant species and bio-resources, there is a need for legislative measure against indiscriminate removal of plants from non-agricultural land. A bio-informatics cell needs to be set up to record the existing plant wealth and ensure its conservation.

ENERGY

Energy is among the basic requirements of man, besides food, shelter and clothing. Human beings consume almost every form of energy, such as fossilized fuel, sun, wind, water, thermal or biological energy. Punjab mainly consumes fossil fuel as energy, besides hydro power.

Conventional Energy Sources

Natural non-renewable resources: Coal and petroleum are the natural non-renewable fuels used in the state. Punjab has none of these resources and is totally dependent on import from other states of the country, though there are two coal-based thermal power plants at Bhatinda and Ropar. Other sources of energy, such as petrol, diesel, furnace oil, kerosene and LPG are used in the state for transportation, industry, domestic purposes and in agriculture.

Natural renewable resources: Hydro-energy is the most important source of renewable energy in the state. Both large-scale and micro hydro electricity projects have been set up, out of which ten are state owned and three are shared with other states.

Another form of conventional renewable energy used in the state is bio-mass in the form of fuel wood, agro-waste and cattle-dung cakes. According to a report dung-cake consumption during 1978-79 was about three million tonnes in Punjab. It is estimated that by the year 2004-05 it will be about 10 million tonnes.

Non-conventional Energy Sources

In view of the ever increasing demand for energy and depletion of the world's conventional fuel resources, and their impact on the environment, non-conventional sources of energy need to be tapped.

Solar energy: Punjab has approximately 293 days/year of bright sunshine. This provides a large base for tapping natural energy resources. Solar energy can be utilized for the following five purposes:

- i) Low-temperature collection system for domestic heating
- ii) Concentrating collection system
- iii) Photo-electric system
- iv) Photo-synthetic system

Wind energy: Wind is also another important source of non-conventional energy. It involves the use of air masses of different densities and temperatures. Utilization of wind energy had been in practice in rural areas of the state before the seventies for winnowing threshed crops. It has now been substituted by machines. The potential of wind energy utilization is under study for more effective use.

Cogeneration: Production of energy from steams in boilers is also being tried out in some industries of the state. This could be further enhanced by using various weeds as fuel for these boilers. Such weeds as water hyacinth, congress grass and lantana, which otherwise create enormous environmental problems in the state, could be used as fuel.

IMPROVING EFFICIENCY IN NATURAL RESOURCES USE

Land

Land is a valuable asset particularly when it is agricultural land. In Punjab, with 186 per cent cropping intensity, agricultural land is fully exploited and has started showing signs of fatigue in certain areas. Since agricultural soils in Punjab are alluvial deep, varying from sand to silty clay, it has taken centuries to form the fertile surface layer (5 to 10 cm) of the soil. The fertile layer is often washed away by floods and also eroded by wind and water (Table 15). Preservation of the surface layer, with its accompanying nutritional and biological support system, assumes significance as its loss would lead to loss in agricultural productivity.

Table 15
Runoff and Soil loss from Non-arable and Arable Land of Varying Sizes in the Shivalik Foothills of Punjab

		Area (ha)	Run (%)	Soil loss (t/ha/yr)
(A)	Non-arable lands			
(i)	Large catchments	1630-5610	26-42	38-225
(ii)	Small catchments	3 to 80	21-45	11-189
(B)	Arable lands	0.25 to 3	20.35	10.62

Source: Sur H.S. (2000) Director, Zonal Research Station, Bullowal, Saunkhri

Preservation and conservation of agricultural land is the responsibility of the cultivator, who looks after it so that it remains productive. He has to put in an appropriate quantity of nutrients and other ingredients, in place of those taken out in the process agricultural production, to maintain the land's fertility level. Unfortunately, this has not been happening and as a result our soils are becoming less productive because of loss of macro- and micro-nutrients in several areas. Establishment of a network of soil-testing laboratories as a facility to the farmer will go a long way in advising the cultivators about the hunger of the soil and its productivity potential.

Wastelands, another area of concern, are gradually increasing. Adjoining areas of urban habitation are becoming reservoirs of non-biodegradable wastes. The Government of India started an integrated wasteland development project in 1988-89 to develop wastelands based on village/micro watershed areas. However, dumping grounds around urban and factory areas, where effluents are deposited, and those of leftover brick kilns, quarries and old residential sites constitute a large mass of wasteland which is increasing day by day, but their reclamation and re-use has received little attention. Such areas are not only rendered permanently unusable but are also a source of pollution of air, land and groundwater. Attention needs to be paid to such areas too. Saline soils and water-logged soils are usually man made. Reversing the process of water-logging and soil salinity is a long drawn exercise and has to be done on a community basis. On the other hand, prevention of the development of salinity and water-logging is easily possible through proper extension of knowledge to the farmers. Sustainable agriculture, as a means to ecological conservation, calls for special attention to the management of land, which is our natural resource and should be well maintained.

Water

Water being a critical component of the life-support system, the national emphasis is on drinking water, followed by agriculture, industry and power. The basic needs for human beings, bovines and small remnants are 40, 30 and 1.5 litres per capita per day respectively. This does not include the requirements of wildlife. Scarcity of water can cause great hardship, while its abundance, particularly due to rains or floods, can cause havoc. As the underground water in the state is getting depleted, special attention has to be paid to water management and for this rain-water conservation is an important component. Most of the rain-water normally flows away. If, out of this, adequate precipitation is stored in the soil-profile itself as sub-surface water, and wells as groundwater, it will save the soil from erosion and mitigate the impact of droughts and floods. Siltation of reservoirs and canals will also be reduced. Conservation of rain-water is the requirement of the day, so that the depleting underground water is recharged and pressure on withdrawal for irrigation is reduced. Technology to conserve rain-water from rooftops of urban houses and runoff water of open spaces is available and is being used with success in Andhra Pradesh and other places. Water so collected is used for recharging the underground water basin and also for irrigation and other purposes. In Kandi area where there is high runoff of rain-water, there is also an acute shortage of drinking water. Efforts have to be made to devise means to relocate rain-water of the monsoon season in a manner that it could be used for the sustainability of agriculture, human and plant resources.

Forests

Forests are the lifeline of all development activities and sustenance of human life. Increasing forest cover through proper management, protection and regeneration are essential components of conservation of soil and water resources and above all for regulating climatic aberrations. In Punjab, forests are important for continuing its agricultural activities. In addition, forests of neighbouring states, especially Himachal Pradesh and Jammu and Kashmir, are more important, as the entire water resources and climatic variables are totally dependent on the forest cover of these states. Degeneration of forests in these states has a direct bearing on Punjab's agricultural development programmes. Joint efforts by the three states to preserve and enlarge their

forest cover, through a consortium action-programme, will be of mutual benefit and steps should be initiated in this direction urgently.

COMMUNITY PARTICIPATION IN NATURAL RESOURCES MANAGEMENT

The report of the working group on watershed development, rainfed farming and natural resource management for the Tenth Five Year Plan (2002-2007), that the Planning Commission of the Government of India submitted in September 2001, has emphatically pointed out that many government schemes concerning land, water and watershed development programmes started well but could not be operated on a sustainable basis due to lack of community and stakeholders' participation. Wherever success has been achieved in the conservation of natural resources on a sustainable basis, it has been on account of local participatory activity. Plans and projects of the government, which have secured active participation of the communities, have achieved notable success. The watershed development project in Sukhomanjri (Shivalik hills) has succeeded and attracted attention because of community participation, which created necessary conditions for the development of a sustainable crop-production system, as a result of water- and land-conservation and scientific management.

Active participation of the people and the community in the conservation of natural resources is very important in executing the relevant programmes. It has to be a people's programme to conserve nature through developing micro-planning for execution with the support of the government. People would participate meaningfully when production increased or stabilized and they got their share of the benefits therefrom. Without direct and tangible benefits, participation of the stakeholders would remain passive and just a few big influential farmers would corner a large proportion of the assistance. The role of Panchayati Raj Institutions assumes importance in this context. Programmes of natural conservation need to be re-oriented in favour of the Gram Sabha members, that is, the villagers. Conditions must be created for them to feel that the cattle resources, the forests, the common land, water and waste-land, etc., belong to them and their conservation would mean improved productivity. The participation of women and the landless in the process of decision-making is also equally important to ensure their active co-operation. *Conservation of natural resources needs to be conceived as a means and the production system as an end.*

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Chapter 3

FISCAL AND FINANCIAL MANAGEMENT

A GLIMPSE OF THE ECONOMY OF PUNJAB

Punjab is the most advanced state in the country, with a high per capita GSDP, highly productive agriculture a well-developed physical infrastructure and a high human development index. However, the fiscal balances of the state government worsened in the early nineties and has continued to deteriorate by accumulating debt faster than the growth of the economy. This is due to indiscreet high revenue expenditure by the state government and its agencies.

Given the well-developed infrastructure and a high level of income, the state is an important market for consumables. Normally, it should have the advantage of making a quick transition into industry and the service sector with linkages with its own resources and those of the neighboring states.

At Rs.18,762 per capita Net Domestic Product (1997-98) its per capita output is 50 per cent higher than the all India average. Its position is second only to Goa, but Maharashtra is fast closing the gap from below. Punjab accounts for almost 1.6 per cent of India's geographical area and 2.36 per cent of its population. More than 33.95 per cent of the states' population is urban, which is higher than the all-India average of 27.78 per cent.

- Incidence of poverty is about six per cent (2000-01), the lowest among all the major states.
- Life expectancy is the second highest among all the states in the country, after Kerala, for both males and females.
- In literacy, however, it has lagged behind Kerala, Maharashtra and West Bengal, both for males and females.
- There is a distinct improvement in the provision of health facilities in Punjab. At present, there is one doctor for 1,485 persons. The infant mortality rate is 51 per 1000 as compared to the all India figure of 71 per 1000.
- The state's economy is mainly agricultural, as about 38.66 per cent (Q) of the GDP is from agriculture and allied activities. Industry accounts for 24.90 per cent (Q) and the services industry for the remaining 36.44 per cent (Q) for the year 2000-2001.
- Over 95 per cent of the state's gross crop area is irrigated. The cropping intensity is 187 per cent as compared to 131 per cent at the all-India level. Yield of foodgrains per hectare is almost 5,000 kg, the highest in the country.
- Consumption of electricity by agriculturists is on the rise. In 1999-2000, 39.33 per cent of power was consumed by 7,71,132 tube wells for pumping water for irrigation.

The state of foodgrain production is relevant for the present economy of Punjab. After near stagnation in 1999-2000 and a negative growth of two per cent in 2000-01, the agricultural sector in India attained a growth rate of nearly six per cent in 2001-02. One of the reasons for this is that the distribution of the monsoon rainfall in 2001 has been one of the best in recent years. The production of foodgrains in 2001-02 touched

209 million tons, an increase of 13 million tons over the previous year. Late winter rains in the northwest of India in February 2002 helped to raise foodgrains production to 212 million tons.

In 2001-02, the Food Corporation of India (FCI) procured 20.63 million tons of wheat a record level. Rice procurement also reached a record high in 2001-02. The unusually high procurement of wheat and rice in the last two years has led to accumulation of huge surplus stocks much above the minimum buffer stock norms. The FCI held in stock 58 million tons of wheat and rice in February 2002 against 16 million tons of buffer stock.

The primary reason for excessive procurement is the high Minimum Support Price (MSP). Offtake of foodgrains under the Public Distribution System has been low. Purchases by private traders have gone down considerably.

The food subsidy bill increased from Rs.2,850 crore in 1991-92 to Rs.12,010 crore in 2000-01. For 2001-02, the food subsidy is estimated at Rs.14,000 crore, out of which almost half is accounted for by buffer-stock subsidy or carrying cost of public stocks of foodgrains.

Measures have been taken to liquidate excess stocks: open market sale and export of foodgrains at prices much below the economic cost and increased below poverty-line allocations under the targeted Public Distribution System (PDS). These measures are attempts to reduce the carrying cost of surplus foodgrains.

One of the long-term measures for reducing the foodgrain subsidy and the carrying cost include decentralized procurement of foodgrains and encouraging greater role of the private traders.

The wheat-and-rice rotation dominating Punjab agriculture is a cause of concern because of ballooning stocks of these commodities with the FCI and its inability to find buyers in domestic or foreign markets. This is likely to affect future minimum support prices for these commodities.

A system of contract farming through private sector companies, agricultural marketing and foodgrain processing, together constitute an alternative to near total purchase of wheat and rice crop by the FCI. This will necessitate elimination of such intermediaries as brokers, doing away with tax collection by the State Marketing Board, the Rural Development Board and purchase-tax on foodgrains, which works out to about 10 to 11 per cent of the price. This will encourage private sector players and multinational foodgrains giants to lift farm produce directly from the fields at pre-negotiated prices, avoiding brokers and intermediaries.

Presently, private players, including such multinationals as CARGIL, are allowed to procure foodgrains through market intermediaries at the minimum support price, after paying the brokerage, market expenses and taxes. These buyers pay escalated costs which make direct purchase from farmers less attractive.

In contract farming, revenue sharing with the farmers is based on a cost-plus return basis. The number of private operators for direct purchase of foodgrains from the farmers will increase in due course and make the concept operational. However, workable tripartite agreements between farmers, the private sector and government will

have to be finalized to ensure that where there is a breach of contract, a proper system to redress the grievances is available. This is within the present legal competence of the state. This contract farming system by private operators, including multinationals, is a good alternative for assured return to the farmers and also for achieving the ultimate goal of value-added processing of the agricultural produce of the state.

Since the excess production on account of the persistence of wheat-and-rice rotation in Punjab is defying all solutions, the state is also considering a proposal to compensate the farmers at the rate of Rs.5,000 per acre for diverting land to other commercial/non-commercial crops. This is an operationally suitable proposal, provided the central government supports it, as Punjab, with its very large production of wheat and rice and almost empty coffers, cannot bear the additional financial burden. The Planning Commission, it is understood, is not likely to support the proposal. Land-use should better be determined by the market/price mechanism and not decided by subsidies. The proposed compensation will be a burden if it is in addition to the Minimum Support Price (MSP) policy of the Government of India. A convincing proposal to compensate farmers for diverting a part of their land from wheat/rice rotation has to be formulated for central support.

There was a significant slowdown of industrial growth in 2000-01 and it continued with greater intensity in 2001-02. Overall growth during April-December 2000-01 was 2.6 per cent, compared to 5.8 per cent during the corresponding period of the previous year. High interest rate, infrastructure constraints and lower domestic and internal and external demand are the factors responsible for the slowdown. Unsatisfactory performance of infrastructure development during 2001-02 is reflective of the overall slowdown in the economy.

The growth of large, medium and small industries in Punjab is given in Table below.

Table 1
Growth of Large/Medium and Small-scale Industries in Punjab

Year	Growth of Large/Medium Industries in Punjab 1980-81 to 99-2000				Growth of Small-scale Industry in Punjab 1980-81 to 1999-2000			
	No. of units	Employment (no.)	Fixed investment Rs. (Million)	Production Rs. (Million)	No. of units	Employment (no.)	Fixed investment (Rs. in million)	Production Rs. (Million)
1980-81	228	107767	7270	1,1410	4,3338	264869	3320	11180
1985-86	292	132174	14900	2,5350	9,7517	464809	7390	21510
1990-91	373	187311	40030	7,1640	16,0388	668845	13490	40500
1995-96	526	210448	87441	16,6561	19,1025	802329	22161	97139
1998-99	602	227929	140381	25,3760	19,7344	864592	33607	144445
1999-2K	611	236000	147660	23,7200	19,9000	883000	37940	166100
2000-01	638	252000	170000	35,6000	20,1000	897000	42500	195250

Source: *Economic Surveys of Punjab.*

Industry in Punjab largely provides a low level of employment and most of the low-paid jobs, comprising unskilled labour, have been taken by migrants from other states. The educated or technically qualified youth of Punjab are facing prolonged unemployment due to underdevelopment of the industrial and commercial sectors.

At present there is a lull in industrial activity in Punjab. The steel-melting industry has suffered the most in the recent slowdown. A power load of about 300 MW has been surrendered by industry because of its poor state of health. The textile industry, particularly yarn producing units, are getting progressively sick.

According to the preliminary report of the Industrial Revival Advisory Committee set up by the government, as many as 16,000 small and medium units are sick or likely to become sick. In addition, some of the cycle and cycle-parts units are also progressively getting into distress. The Advisory Committee has recommended that the state government must fulfill the promise of releasing incentives, and cash disbursement should be made to the units, wherever due, as promised, to help the industry face this critical situation. This may help their revival.

With comparatively satisfactory economic fundamentals, Punjab should be able to achieve a growth rate of eight to ten per cent in the short run. For this purpose it is necessary to plan and develop new industrial areas to meet the aspirations of the new generation of entrepreneurs. In addition, the technical education system should be revamped and reoriented so that the educated and trained youth become employable particularly in industry. Agro-processing, light engineering and textile industries have a potential for growth and development in Punjab. After information technology, it is biotechnology which has unlimited scope in sectors such as agriculture, animal husbandry, human health and environment.

According to the Advisory Committee, Punjab State Industrial Development Corporation (PSIDC) and Punjab Financial Corporation (PFC) have made significant contributions to the growth and development of small and medium industries. It has suggested the setting up of a Special Purpose Vehicle (SPV) for taking over assets at retrievable market prices. All powers of recovery under Section 29 of the State Financial Corporation Act, the Land Revenue Recovery Act and the sale of mortgaged assets with the help of the Debt Recovery Tribunal should be given to the Special Purpose Vehicle (SPV). This is at variance, to some extent, with the recommendations of the Punjab Disinvestment Commission, which has suggested the setting up of an Assets Management Authority for taking care of non-performing assets and other similar investments.

The Centre for Monitoring Indian Economy (CMIE), in its forecast for the period ending 31 July 2002, has reduced India's industrial growth in the current financial year to three per cent from the earlier estimated growth of 3.5 per cent, because of the failure of rains in the first two months of the monsoon season. The monsoon is vital to India's economic health, as agriculture constitutes 25 per cent of the country's GDP and employs 70 per cent of the population. The CMIE estimates that such sectors as food products, consumer goods, textiles, garments and two-wheelers would be adversely hit. It expects the manufacturing sector to grow at a moderate pace of three per cent in the current year compared to 2.8 per cent in 2001-02.

CURRENT FINANCIAL POSITION OF PUNJAB

A look at the fiscal deficit and revenue deficit (Table 2) reveals the deteriorating financial situation of Punjab. The revenue balance of the state has been consistently in deficit.

Table 2
Punjab – Deteriorating Revenue and Gross Fiscal Deficits (Rs. in crore)

Years	Revenue Surplus/ Deficit (+/-)	Fiscal Deficit (-)	Revenue Surplus/ Deficit (+/-)	Fiscal Deficit (-)
	(In Rupees Crore)		(As a percent of GSDP)	
1991-92	(480.87)	(1150.50)	-2.11	-5.20
1992-93	(635.59)	(1251.95)	-2.42	-4.92
1993-94	(766.93)	(1493.41)	-2.54	-4.94
1994-95	(741.84)	(1785.24)	-2.18	-5.25
1995-96	(450.24)	(1364.64)	-1.17	-3.56
1996-97	(1357.06)	(1464.68)	-3.07	-3.30
1997-98	(1483.90)	(2477.58)	-3.07	-5.07
1998-99	(2628.67)	(3779.32)	-4.83	-6.88
1999-00	(2727.11)	(3172.21)	-4.38	-5.12
2000-01	(2335.97)	(3903.75)	-3.41	-5.70
2001-02 (RE)	(3842.00)	(5211.00)	-5.48	-6.92

Source: *White Paper on the State Finance, March 2002*

The revenue deficit reached its peak of 4.83 per cent in 1998-99. This is stated to be due to the implementation of the Punjab Pay Commission.

Fiscal deficit on the average has been over 5.25 per cent of GSDP during 1991-92 to 2001-02. It reached a high of 6.88 per cent of GSDP in 1998-99. The revenue deficit and gross fiscal deficit will touch 5.48 per cent and 6.92 per cent by the end of fiscal 2001-02, as estimated by the State Finance Department.

Finances of the other states of India too deteriorated over the years, particularly after the implementation of the Fifth Pay Commission Report in 1997, but the gross fiscal deficit in Punjab has remained persistently high even by all-India standards (Table 3)

Table 3
Gross Fiscal Deficit as a Ratio of NSDP in Fifteen Major States (in percent)

States	1990-91	1995-96	1997-98	1998-99
Orissa	6.4	5.8	6.3	9.4
Rajasthan	3.0	6.3	4.9	8.6
Uttar Prudish	6.2	4.3	5.7	7.6
Punjab	7.4	4.0	5.6	7.4
West Bengal	5.2	4.1	4.6	7.1
Goa	9.4	3.5	3.5	6.6
Gujarat	7.4	2.7	4.0	6.3
Haryana	3.2	3.8	3.4	5.8
Andhra Prudish	3.1	3.4	2.8	5.5
Kerala	6.6	3.7	5.0	5.3
Madhya Prudish	3.8	2.8	2.6	5.2
Tamil Nadu	4.1	1.8	2.3	3.8
Bihar	7.0	3.9	1.9	4.1
Karnataka	2.7	2.8	2.3	3.8
Maharashtra	2.8	2.8	3.5	3.5

Source: Planning Department, Punjab

The ratio of debt to GSDP touched a high of 40.66 per cent in 2001 and is expected to go up to 47.16 per cent in 2002 BE (Table 4). The guarantees too have been on the rise and, as reported in the White Paper on Punjab Finances, touched Rs.50,000 crore in 2002. The guarantees were also given to Public Sector Undertakings (PSUs), co-operative institutions and for cash credit limit for food procurement.

Table 4
Debt of the State Government (Rs. In crore)

At end-March	Internal Debt of the State Govt.	Loans and Advances from the Central Govt.	State Provident Funds	Insurance and Pension Funds	Total Debt Stock	Total Borrowings during the Year	Total Stock as a Proportion of GSDP (In percent)
1991	421.88	5731.78	694.16	22.16	6869.98	1212.27	36.38
1992	459.99	6607.22	809.31	28.32	7904.84	1034.86	34.61
1993	498.62	7734.35	976.26	35.60	9244.83	1339.99	35.19
1994	534.46	8721.73	1199.61	43.89	10499.69	1254.86	34.71
1995	1110.46	9543.92	1441.78	53.25	12149.41	1649.72	35.63
1996	1863.80	9952.73	1749.54	63.93	13630.00	1480.59	35.36
1997	1913.70	11049.10	2211.34	75.41	15249.55	1619.55	34.53
1998	2391.70	11979.22	2756.20	88.42	17215.54	1965.99	35.58
1999	4150.32	13056.97	3566.17	103.31	20876.77	3661.23	38.37
2000	4365.73	14727.39	4449.23	118.87	23661.22	2784.45	37.98
2001	9612.41*	13008.28	5073.48	136.16	27830.33	4169.11	40.66

Source: White Paper on the State Finances, Punjab: March 2002

Note *: Includes Rs.4042.03 crore loans against small savings which were earlier shown under loans and advances from Central Government.

Revenue receipts as a percentage of GSDP have been erratic. Revenue receipts from tax revenue and non-tax revenue from 1985-86 to 2001-02 is shown in Table 5.

Table 5
Punjab – Erratic Revenues
(As a proportion of GSDP)

Years	Tax Revenues	Total Non-Tax Revenue	Total Revenue
1985-86	8.52	4.19	12.71
1986-87	9.41	3.39	12.79
1987-88	9.03	2.81	11.83
1988-89	8.88	3.02	11.90
1989-90	8.73	2.22	10.94
1990-91	8.42	2.38	10.80
1991-92	8.30	8.50	16.79
1992-93	8.28	2.67	10.95
1993-94	8.36	2.47	10.84
1994-95	8.89	6.70	15.59
1995-96	8.08	5.46	13.54
1996-97	7.34	5.19	12.53
1997-98	7.58	5.42	13.00
1998-99	7.00	3.47	10.47
1999-00	7.40	5.29	12.05
2000-01 (RE)	8.44	7.22	14.74
2000-02 (BE)	8.38	6.89	14.36

Source: Punjab Government Budget Documents

The growth of revenue income has shown a substantial increase in the years 1999-2000 and 2000-01. This is largely due to a progressively higher yield from sales tax, which almost doubled during 1997-98 to 2001-02. The growth of receipts from all sources is shown in Table 6.

Table 6
Revenue Performance 1997-98 to 2001-02 Rs. in crore)

Items	1997-98	1998-99	1999-00	2000-01	2001-02 (Revised Estimates)
A. Revenue Receipts					
i. Tax Revenue					
1. Sales tax	1401.14	1489.66	1977.28	2644.41	2690.00
2. State excise	1143.70	1204.27	1231.57	1324.67	1350.00
3. Tax on vehicles	215.68	266.72	321.37	338.32	320.00
4. Electricity duty	37.79	31.90	76.47	145.06	134.00
5. Entertainment tax	8.96	8.90	10.29	14.22	19.26
6. Stamps & registration	233.64	258.12	325.65	424.06	445.00
7. Land revenue, etc.	3.57	2.90	4.84	7.17	8.30
Total	3044.68	3262.47	3947.47	4897.93	4966.56
II. Non Tax Revenue					
State's Own Revenues (I+II)	5401.21	4769.82	6308.93	7833.17	8099.09
III. Transfers from Govt. of India					
1. Plan & Non-Plan Grants	293.11	398.98	520.34	827.07	917.34
2. Share of Central Taxes	656.98	587.16	638.59	716.62	608.18
Total-III	950.09	986.14	1158.93	1543.69	1525.52
Total Receipts-A (I+II+III)	6351.30	5755.96	7467.86	9376.86	9624.61

Source: Punjab Government Budget Documents

The figures in Table 7 indicate that the GSDP ratio of total revenue receipts in 1999-2000 has shown a downward trend from 13.46 per cent in 1995-96 to 11.91 per cent in 1999-2000.

The GSDP ratio of tax revenue and non-tax revenue has gone down from 8.03 per cent and 5.43 per cent in 1995-96 to 7.31 per cent and 4.60 per cent respectively in the years 1999-2000, whereas capital receipts have substantially increased to 8.2 per cent because of larger borrowings. Borrowings, it is noticed, have not been invested for development purposes but utilised for defraying revenue expenditure.

Table 7
Receipts – GSDP Ratio (Per cent): 1990-91 to 1999-2000 (In per cent)

Head of Account/Year	1990-91	1994-95	1995-96	1999-00
Aggregate receipts (A+B)	15.24	21.59	18.18	20.11
A. Total revenue receipts (I+II)	7.47	15.55	13.46	11.91
Own source receipts (I (a) + II(c))	5.13	13.50	11.50	10.06
Receipts from Centre (I (b) +II (d))	2.33	2.05	1.96	1.85
I. Tax revenue (a+b)	5.27	8.87	8.03	7.31
a. State own tax revenue	3.92	7.62	6.88	6.30
b. Share in Central taxes	1.35	1.24	1.15	1.02
II. Non-tax revenue (c+d)	2.19	6.68	5.43	4.60
c. State own Non-tax revenue	1.21	5.88	4.61	3.77
d. Grants from the Centre	0.98	0.80	0.82	0.83
B. Total capital receipts (I to X)	7.78	6.04	4.72	8.20
I. Internal debt	0.24	1.51	1.30	1.62
II. Loans and advances from Centre	6.47	3.48	2.08	1.74
III. Special securities issued to NSSF	0.00	0.00	0.00	2.73
IV. Recovery of loans	0.23	0.14	0.14	0.17
V. Contingency fund (net)	0.00	0.00	0.00	0.01
VI. Small savings and provident fund etc., (net)	0.64	0.74	0.83	1.43
VII. Reserve fund (net)	-0.01	0.01	0.01	0.05
VIII. Deposits and advances (net)	0.25	0.13	0.18	0.45
IX. Suspense and miscellaneous fund (net)	-0.04	-0.01	0.08	-0.04
X. Remittances (net)	0.00	0.04	0.09	0.04

Source: State Finances, Reserve Bank of India, January 2002.

The Punjab has a high per capita income but the own tax ratio to GSDP is consistently lower than other major states as evident from Table 8. This trend suggests a distinct possibility of enhancing the tax ratio to GSDP. On the expenditure side, Gujarat and Maharashtra have a lower ratio of revenue expenditure compared to Punjab. Relatively higher revenue expenditure with lower resource mobilization indicates scope for reducing in the revenue deficit by improving the tax ratio to GSDP.

Table 8
Ratio of Own Tax Revenue to GSDP (In per cent)

Year	Gujarat	Karnataka	Kerala	Maharashtra	Punjab	Tamil Nadu
1980-81	7.2	7.7	7.0	6.8	6.9	8.1
1985-86	7.7	9.3	8.4	8.0	7.1	10.1
1990-91	8.6	10.1	8.7	7.9	6.8	10.2
1991-92	9.4	9.7	7.6	8.1	6.8	10.4
1992-93	8.6	9.5	8.4	7.2	6.7	10.0
1993-94	8.7	10.0	8.4	7.0	6.9	9.5
1994-95	8.0	9.5	8.7	7.6	7.3	9.9
1995-96	8.0	10.4	8.7	7.3	6.6	10.9
1996-97	7.9	10.0	9.1	6.8	6.0	10.5
1997-98	7.6	9.9	9.0	7.5	6.0	9.9

Source: Planning Department, Punjab

DEFICIT AND DEFICIT FINANCING

Deficits are largely the result of government's overspending and to a lesser extent due to meagre tax receipts. Budget deficits in Punjab have been growing over the past decade in particular. Deficits have sharply increased the public debt (the accumulated burden of yearly budget deficits), which in Punjab jumped to an alarming figure of 47 per cent of GDP of the state in 2001-2002, weakening government finances and draining resources from the economy.

The abrupt increase in revenue deficit in 1998-99 was on account of the implementation of the Pay Commission Report. The deficit for the year 2001-2002, according to the revised budget estimates, is Rs. 3,842.00 crore.

inflows of income from its own revenues and transfers from the Government of India have been inadequate to meet the mounting pressure of revenue expenditure. Public debt has been a convenient tool for raising resources and the state continues to rely on borrowings to finance its deficits. The revenue deficit (RE) for the year 2001-02 is Rs. 3,842.00 crore which is 5.48 per cent of GDP. Interest payment liability, for the year 2001-2002 (RE) is Rs. 2,812.19 crore, which is about one-third of the revenue receipts. The revenue deficit from 1991-92 onwards is shown in Table 9.

Table 9
Revenue Deficit of Punjab (Rs. in crore)

Year	Revenue receipts	Revenue expenditure	Revenue deficit (2-3)	Percentage of revenue deficit of GSDP
1991-92	3715.84	4196.71	(-) 480.87	2.11
1992-93	2786.93	3422.52	(-) 635.59	2.42
1993-94	3276.63	4043.56	(-) 766.93	2.54
1994-95	5300.92	6042.76	(-) 741.84	2.18
1995-96	5184.75	5635.00	(-) 450.25	1.17
1996-97	5568.61	6925.67	(-) 1357.06	3.07
1997-98	6351.30	7835.20	(-) 1483.90	3.07
1998-99	5755.96	8384.29	(-) 2628.33	4.83
1999-00	7467.87	10195.28	(-) 2727.41	4.38
2000-01	9376.86	11712.83	(-) 2335.97	3.41
2001-02(RE)	9624.61	13466.61	(-) 3842.00	5.48

Source: Punjab Government *Budget Documents*.

Resource conservation is as important as resource mobilization. Unfortunately, no effort has been made to conserve resources and to stop or reduce the outflow of funds for unproductive purposes. Despite an unsatisfactory financial position, the state continues to forego and dissipate scarce resources by giving concessions and freebies. The state is indulging in the luxury of granting exemptions from payment of house tax on self-occupied properties, exemption of sales tax amounting to Rs.900 crore per year, exemption from payment of water rates by farmers, giving free electricity to farmers and to the Scheduled Castes for household use non-revision of user charges on water supply in urban areas, liberal free travel in government buses to students of primary and high schools/colleges/polytechnics, women over the age of 60 years and concessional

travel to personnel of police and jails departments. This is causing loss to the state transport department running transport services on a commercial basis and also to Punjab Road Transport Corporation.

The government has been giving free canal water for irrigation to farmers since 1997 and thus losing a revenue of about Rs. 20 crore per year. Land revenue was yielding Rs. 3.45 crore per annum before it was abolished.

The state government is taking on itself additional liabilities, such as pension benefits to the staff of the government-aided private schools and for employees of government-aided colleges. Employers and employees, according to the new policy concept, are to contribute to a privately managed pension fund so that there is no burden on the consolidated fund of the state. This is a contradiction in the liberalized era of reforms.

Ultimately, the taxes needed to support current government commitments fall as a burden on the tax payers. There is a consensus among the states on the need to reduce deficits, but as yet very few have addressed the problem comprehensively. Most of them are engaged in piece-meal measures to reduce the pressure of deficits. The electorate usually finds reduced spending more tolerable than increasing taxes. Cuts in expenditure are painful, but can be strategically aimed at unpopular programmes. Cutting expenditure has also its limits; therefore, increasing the tax base is the option. Although tax increases are politically risky in the present context, the state government will need to raise tax rates to cover costs of social security, education and health-care and also as a measure to transfer wealth from the rich to the poor.

REVENUE EXPENDITURE

The share of committed expenditure of the Punjab Government, consisting of wages and salaries, pensions and interest payments, has registered a rapid rise. Since 1996-97, this committed expenditure has exceeded revenue receipts of the government, as shown in Table 10.

The rate of growth of pensions has been the highest, followed by wages and salaries. In the last 10 years, pensions have grown nine times and wages and salaries four times. The present pension scheme for government employees puts an open-ended financial burden on the government. An expert group set up by the Government of India has submitted its report. It has proposed a hybrid scheme for which it combines contributions from employees and the state government on a matching basis, assuring the employees a defined benefit as pension. A pension scheme based on these parameters will reduce the mounting burden on the Consolidated Fund of the state and release funds for development.

Table 10
Committed Expenditure on Major Items of Punjab State (Rs. in crore)

Items	1991-92	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02(BE)
Salaries & wages	1182.75	2333.43	2867.54	3680.70	3820.60	4309.94	4906.19
Pensions & retirement benefits	142.88	348.45	434.25	719.25	1139.88	1116.00	1150.00
Interest payments	360.59	1634.44	1848.76	2316.80	2636.67	2733.04**	2812.19
Grants-in-aid to universities and other aided institutions	108.16	141.28	165.32	196.34	243.79	240.74	240.68
Total 1 to 4	1794.38	4457.60	5315.87	6913.09	7840.94	8399.72	9109.06
Revenue receipts *	2323.67	4136.77	4576.40	4863.87	5695.68	7136.43	8806.17
%age of committed exp. to revenue receipts	76.99	107.76	116.16	142.13	137.66	117.70	103.44

Source: Punjab Government *Budget Documents*.

Note: * Excludes interest receipts from PSEB adjusted against RE subsidy, notional grant under waiver of Special Term Loans and includes net receipts under Lotteries.

** Includes moratorium on interest granted by the EFC (Rs. 390.00 crore).

Punjab Government employees have been consistently enjoying pay scales higher than even those announced by the Central Pay Commission. Table 11 gives comparative information in selected categories for Punjab, Haryana and the Government of India.

Table 11
Selected Comparative Pay Scales: Government of India, Government of Punjab and Government of Haryana

Post/Category	Haryana	Centre	Punjab
Peon	2550-3200	2550-3200	2620-4140
Clerk	3050-4590	3050-4590	3120-5160
Assistant	5000-7850	5000-8000	5800-9200
Sr. scale steno	4450-8000	5000-8000	5800-9200
Executive engineers	10000-3900	1000-15200	12000-15500

Source: Finance Department, Punjab.

There are several categories of employees in the state, who get time-bound increases in scale, even though such a facility does not exist for Government of India employees. The state government allows payment of Central Dearness Allowance instalments. Public sector undertakings too follow these high pay scales. The consequent ballooning

debt has resulted in a high interest burden, and the excess committed expenditure has been supported by borrowings.

Capital expenditure has consistently remained below two per cent due to high expenditure on wages, pensions, interest payments and non-plan revenue expenditure. Expenditure on police has increased four times during 1990-91 to 2000-2001. Punjab Government implemented the revision of salaries with effect from January 1996. This aggravated the precarious financial position of the state. Salaries, wages and pension bills jumped from Rs. 2,180 crore in 1995-96 to Rs.2, 682 crore in 1996-97 and then to Rs.4, 400 crore in 1998-99 and Rs.5, 426 crore in 2000-2001, by which time the arrears were cleared.

The composition of developmental and non-developmental expenditure as percentage of GSDP of Punjab is given in Table 12.

Table 12
GSDP Ratio of Expenditure: 1990-91 to 1999-2000 (In per cent)

Budgetary Head/Years	1990-91	1994-95	1995-96	1999-2000
Aggregate expenditure (I to III)	15.15	16.11	16.57	19.21
I. Development expenditure (a+b)	3.54	5.51	4.24	7.96
a. Social services	0.55	0.47	0.50	4.42
b. Economic services	2.99	5.03	3.73	3.54
II. Non-development (General services)	1.20	2.71	2.01	9.01
III. Miscellaneous	10.41	7.89	10.32	2.24
Total revenue expenditure (I to III)	11.76	10.69	12.66	16.34
I. Developmental expenditure (A+B)	1.40	0.99	0.99	7.31
A. Social services	0.48	0.36	0.41	4.35
B. Economic services	0.91	0.62	0.58	2.96
II. Non-developmental (General services)	1.06	2.49	1.83	8.95
III. Compensation of local bodies	9.30	7.21	9.84	0.08
Total capital disbursement (I + II)	3.39	5.43	3.90	2.86
I. Total capital outlay (1+2)	2.28	4.74	3.43	0.70
I. Development (a+b)	2.14	4.52	3.24	0.64
a) Social services	0.07	0.11	0.09	0.06
b) Economic services	2.08	4.41	3.15	0.57
2. Non-developmental (General services)	0.14	0.22	0.18	0.06
II. Miscellaneous	1.11	0.68	0.48	2.16

Source: *State Finances, Reserve Bank of India, January 2002.*

From the figures given in Table 12 it is obvious that in 1999-2000 and over a decade the GSDP ratio of non-development expenditure has been rising. This inescapable conclusion is that it is not a healthy sign of the state economy.

The unusually high committed expenditure on wages, salaries, pensions and interest payments and grants in-aid to institutions, as reported in the *White Paper on Punjab Finance (March 2002)*, is 112 per cent (RE) of the total revenue receipts.

Increase in the total debt stock and higher trend of interest rates have resulted in doubling interest outgo as a committed liability, between 1987-88 and 1990-91. Interest payment between 1990-91 and 2001-2002 increased almost nine times to Rs. 3,149.00 crore, which accounts for more than 30 per cent of revenue receipts (Table 13).

Table 13
Mounting Interest Expenditure

Year	Interest Payments (Rs in crore)	Revenue Receipts * (Rs in crore)	Proportion of Revenue Receipts Spent on Interest Payments (%)
1991-92	360.59	2330.67	15.47
1992-93	410.61	2782.80	14.75
1993-94	1042.17	3268.37	31.89
1994-95	1243.69	3751.67	33.15
1995-96	1489.59	3845.46	38.74
1996-97	1634.44	4136.77	39.51
1997-98	1848.76	4576.40	40.40
1998-99	2316.80	4863.87	47.63
1999-00	2636.67	5695.68	46.29
2000-01	**2733.04	7136.43	38.30
2001-02 RE	3149.00	9624.16	32.71

Source: Punjab Government *Budget Documents*.

Note: * Excludes interest receipts from PSEB adjusted against RE subsidy, notional grant under waiver of special Term loans and includes net receipts under lotteries.

****** Includes Moratorium on interest granted by the EFC (Rs. 390.00 crore)

There has been a decline in expenditure on social services from 1988-89 onwards. General services on the other hand has registered an increasing share of expenditure from 1991 onwards.

Given the predominant share of wages and salaries in total expenditure, it will be prudent to freeze future recruitment for all categories of employees including consultants. The compression of non-wage and non-interest expenditure is equally important. Rationalization or increase in user charges will provide much needed budgetary support. Private partnership for delivery of services by off-loading and transferring non-essential functions to the private sector is a pressing budgetary reform.

Recommendations of the Expenditure Reforms Commission (ERC), when received by the government, should provide a useful framework for immediate moderation in expenditure growth. The recommendations have been delayed inordinately and quick action on these will enable the state government to implement reforms from the first year of the Tenth Five Year Plan.

PLAN AND PLAN EXPENDITURE

The persisting deficit adversely affected the plan programme of the Ninth Five Year Plan. No contribution out of revenue resources was possible for the annual plans, which were implemented with borrowings. In the last year of the plan, i.e., 2001-02. The performance was only 58 per cent of the revised outlay. The state was not able to fully

avail of the central assistance for plan programmes and centrally sponsored schemes, because it could not provide the state's share for such schemes.

Performance in Ninth Five Year Plan

The likely financial performance is expected to be 77.46 per cent of the revised outlay of Rs. 12,624.14 crore of the Ninth Five Year Plan. The shortfall in expenditure is due to resources constraints, implementation of the Fifth Pay Commission Report and a substantial increase in non-plan expenditure.

Table 14
Year-wise Financial Performance of the Ninth Five Year Plan (Rs. in crore)

Year	Approved outlay	Revised outlay	Actual expenditure	Performance to approved outlay (In per cent)	Performance to revised outlay (In per cent)
1997-98	2100.00	1940.00	2021.23	96.25	104.19
1998-99	2500.00	2500.00	2007.04	80.28	80.28
1999-00	2680.00	2680.00	1748.85	65.26	65.26
2000-01	2700.00 (2420.00 Core Plan)	2147.14	2045.25	75.75	95.25
2001-02	3357.00 (3025.00 Core Plan)	3357.00	1956.18	58.30	58.30
TOTAL	13337.00	12624.14	9778.55	73.32	77.46

Source: Planning Department Documents.

According to the guidelines of the Planning Commission, Government of India, the size of the Tenth Five Year Plan is fixed at five and half times the budgeted outlay of the Annual Plan 2001-02, and the size of the Annual Plan 2002-03 is to be fixed at ten per cent above the Plan size of the pervious year. In accordance with these guidelines the size of the Tenth Five Year Plan and the Annual Plan 2002-03 work out as under:

Table 15
Outlays for Tenth Five Year Plan (2002-07) and the Annual Plan (2002-03)
(Rs. in crore)

Particulars	Annual Plan 2001-02	10 th Plan (5.1/2 times the size of 2001-02 Annual Plan)	Annual Plan 2002-03 (10% of Annual Plan 2001-02)
Approved outlay	3357.00	18464.00	3693.00

Sources: Punjab Budgetary Documents.

A total Plan outlay of Rs.2, 750 crore only, as against an allocation of Rs.3, 693 crore according to the guidelines for 2002-03, amounts to virtually a 'plan holiday', as the proposed outlay comprises resources from Government of India for Centrally Sponsored Plan, Additional Central Assistance, Eleventh Finance Commission Grants or from institutional sources. Even this minimal plan is not backed by adequate resources.

Available resources for the annual plan for the year 2002-03, as worked out by the State Finance Department, are Rs.1,907 crore. This will not suffice even to meet the salary

component of the Plan, the state's share in the Centrally Sponsored Schemes and schemes funded by institutions. To avail of the full assistance from the institutions and the Central Government, a minimum plan size of Rs. 2,750.00 crore was recommended by the Punjab Government. The Planning Commission has now increased the plan size to Rs. 2,793 crore.

The Annual Plans in the last five years have remained substantially under-achieved. Therefore, the Plan for the year 2002-2003 reflects a major increase when compared with the actual achievements of the earlier plans.

Table 16
Plan Expenditure in the Ninth Five Year Plan (Rs. in crore)

Year	Total expenditure	
	Budgeted	Actual
1996-97	1850.00	1794.39
1997-98	2100.00	2008.21
1998-99	2500.00	2007.04
1999-00	2680.00	1748.86
2000-01	2700.00	2045.25
2001-02	3357.00	1956.18

Source: Planning Department *Documents*.

To meet the minimum requirements of plan expenditure, the state will have to go in for additional resource mobilization to the extent of Rs. 823 crore in 2002-03. The state has agreed to do so.

Additional Resource Mobilization in 2002-03

Disinvestment of State Holdings

The proposed fast-track disinvestment in Punjab Communication Limited, Punjab Alkalis and Chemicals Limited, Punjab Tourism Development Corporation Limited, CONWARE and Punjab State Industrial Development Corporation's (PSIDC) holdings in Punjab Tractor Ltd. (PTL) will bring in additional funds in the kitty of the government. According to estimates of the Industry, PTL alone is likely to net about Rs.250 to Rs.300 crore on the disinvestment of 23.5 per cent shareholdings with the PSIDC. On the disinvestment of holdings in all the companies concerned, the likely inflow of funds, according to the estimates of industry, is expected to be about Rs. 500 crore.

Higher Yield from Sales Tax

The yield from sales tax as projected in the budget of 2002-03 will grow to Rs. 3,250 crore during the current year and is targeted to increase to Rs. 5,000 crore per annum in four to five years. When the existing exemptions of sales tax are withdrawn, the revenue from it is expected to increase still further. The adoption of VAT in place of sales tax with effect from 1 April 2003, consequent upon the 'national consensus for floor rates of sales tax', will result in higher income from this source and it is expected to exceed Rs. 6,000 per year in the last year of the Plan, 2006-07.

Revenue from Stamp Duty and Registration

There is scope for increase in revenue from Stamps and Registration through proper valuation of documents and strict enforcement of the levy of stamp duty. It will require revision of the floor value of properties by the district authorities for the levy of stamp duty, plugging leakages of stamp duty by transfers through general power of attorney and withdrawal of non-merit exemptions from payment of stamp duty. With these measures, revenue from this source will increase to Rs.525 crore for the year 2002-03 and it has the potential to grow to Rs.1,000 crore in four to five years. This projection in the budget is reasonable and achievable.

Plugging of Loopholes in Motor Vehicle Tax

It is admitted that there is large-scale evasion of the Motor Vehicle Tax. This can be eliminated or reduced through strict enforcement measures and liberal issue of route permits. The current year's income at Rs. 350 crore is expected to grow by 10 per cent to 15 per cent. According to estimates in the budget, it is expected to double in the next four to five years, i.e., to at least Rs.700 crore per year in 2006-07.

Rationalization of Electricity Tariffs

Rationalization of electricity tariffs on the recommendations of the State Electricity Regulatory Body is expected to yield Rs. 930 crore. This is the additional income projected in the budget estimates of 2002-03.

Swapping of High Cost Borrowings

According to a scheme formulated by the Government of India enabling the states to repay high-cost loans over the next three years, all loans that carry interest rates higher than 13 per cent will be retired out of growth in collection of 'small savings' on 100 per cent retention by the state and additional market borrowings ear-marked for retiring high-cost debt. It is expected that the weighted cost of borrowing for retiring the high-cost debt, as calculated by the Government of India, is around 9.7 per cent. Through the proposed debt swap, the state will save 3.3 per cent on past borrowings and this will reduce the annual interest payment liability of the state on public debt. However, care needs to be taken so that the additional loan permitted to be raised by the Government of India for retiring high-cost old borrowings are not utilized for current consumption. Reform of the small saving scheme, together with reduction of interest rates and swapping of debt, will go a long way to improve the fiscal situation, by reducing the annual payment on public debt. This measure entitles the state government to assistance from the Incentive Fund created by the Government of India.

Revision of User Charges

Due to non-revision of user-charges for services, such as transport, drinking water, sewerage, technical education, medical education, higher education, secondary and tertiary health care, the quality of these services has deteriorated. Government should suitably revise user-charges to recover the direct operational and maintenance cost of these services in a phased manner. There is a significant departure and commitment by the government, in the budget, to improve the quality of services and by making the users to pay for them.

With additional resource mobilization, economy measures and compression in non-interest and non-plan expenditure, adequate funds will be available, enabling the government to achieve projected financial targets in each of the five years of the Tenth Plan which has, at present a financial target of Rs.18,464 crore as against the actual expenditure of Rs. 9,778.55 crore during the Ninth Plan period. The government can implement a bigger plan even for 2002-03 and provide larger funds for plans from 2003-04 to 2006-07, as the state's contribution for the implementation of the Tenth Plan is in sight.

ACCESSING CAPITAL MARKET FOR INFRASTRUCTURE DEVELOPMENT: PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

The Punjab Government has set up a Punjab Infrastructure Development Board (PIDB) under the Punjab Infrastructure Development Act 1998. The government now levies a cess on an advalorem basis on the sale of all agricultural produce, except fruits, vegetables and pulses. It is also levied on petrol. The cess is credited to the Punjab Infrastructure Development Fund (PIDF) and this fund is generally utilized for the development of infrastructure.

The PIDB has prepared a development plan comprising 12 projects at a total cost of Rs.2,214 crore as given below:

- 1) Chandigarh-Ludhiana highway
- 2) Zirakpur-Patiala highway
- 3) Ludhiana-Moga highway
- 4) Khanna-Nawanshahr road + HLB over river Sutlej
- 5) Ropar-Nawanshahr-Phagwara highway
- 6) Chandigarh-Ambala highway
- 7) Jagraon-Nakodar road + HLB over river Sutlej
- 8) Gurdaspur-Mukerian road + HLB over river Beas
- 9) Bridge over river Suan
- 10) Construction of ROB
- 11) Repair of badly damaged sections and widening of high traffic corridors to 33 ft.
- 12) Upper Bari Doab Canal Project – Remodeling

The Infrastructure Development Plan is to be implemented by convergence of funds from below and the given sources:

- 1) Loans from NABARD
- 2) Transfer from Central Road Fund
- 3) Budgetary support from the state
- 4) Contribution by Railways
- 5) GOI-AIBP
- 6) Market loans through redeemable bonds

The PIDB has raised a sum of Rs.309.22 crore through bonds against an unconditional and irrevocable state government guarantee, with a maturity period ending seven years from the deemed date of allotment, which is 1 March 2001. The PIDB has implemented the road sector projects using a multi-pronged funding approach. Private sector

participation is sought both at the construction phase and during the operation phase. It proposes to levy a toll tax on users of the facilities wherever possible.

The income from infrastructure cess, funds raised through bonds and anticipated transfers from partners has enabled the PIDB to commence construction work on roads, bridges and flyovers through well documented and legally sound contracts. The value of such contracts is around Rs.520 crore. Timely repayment of principal and interest is assured by transferring 62 per cent of the income from PIDF and accruals from toll tax to an escrow account. A sum of Rs.150 crore has been transferred to the PWD (B&R) for upgrading and strengthening the road system and another Rs.50 crore has been given for irrigation development for remodeling the canal system.

This route of raising funds from the market through bonds, supported by special cess and transfers from partners, is a laudable initiative towards the creation of much needed infrastructure for the speedy economic development of the state. This concept of tapping market funds through bonds and repayment through accruals from cess and tolls should be extended to other areas of urban development, such as augmenting water supply, setting up treatment plants, disposal of solid and liquid wastes, urban roads, bridges, flyovers to help the growth of the economy in urban areas in particular.

The Public Disinvestment Commission (Commission) has looked into the working of the Punjab Infrastructure Development Board (PIDB), even though its examination was not in its brief. The Commission has raised a point relating to levy of 'cess' on the purchase of foodgrains by the state government. According to it, there is strong opposition to the levy of cess from the Ministry of Food & Supplies, Government of India. Also private dealers have challenged the levy of this infrastructural cess in the High Court of Punjab and Haryana. The Commission has pointed out that the PIDB is focusing mainly on roads and bridges with its own funds. It maintains that there is little justification for taking over the routine work of the PWD.

The charter of PIDB provides for private capital participation in infrastructural development through BOT (Build, Own and Transfer), BOO (Build, Own, and Operate) and BOOT (Build, Own, Operate and Transfer) basis. According to the Disinvestment Commission, the PIDB has not adhered to the original objective of public-private participation to leverage its funds through bankable projects. It suggested conversion of the Punjab Infrastructure Development Board into a Trust, whose the management could be the responsibility of Punjab State Industries and Infrastructure Development Corporation Limited (PSI IDC).

The track record of PSIDC, particularly its financial prudence, according to the findings of the Commission itself, has been found wanting. It raised loans from the capital market against Government Guarantees for lending to industry by deviating from its entrepreneurial activities. As an institution it has a poor image because of its lending spree over the years and of its present baggage, comprising Rs.1,700 crore as unrecovered loans and its equity in scores of closed and loss-making units. It will not be at all prudent to club PIDB, a growing institution, with a dead or dying institution like PSIDC. The assets and liabilities of PSIDC should be transferred to the Asset Management Company proposed to be floated for recovering loans and salvaging investments by sale of equity in joint and assisted sector companies of PSIDC.

For the first time in the history of Punjab, PWD (B&R) has prepared a bankable Project Report for following projects which will add substantially to the infrastructure of the state. The projects are:

(i)	66 Rail Overbridges	Rs.585 crore
(ii)	Road upgradation in the state	Rs.425 crore
(iii)	Link road widening in the state	Rs.300 crore
(iv)	Border district link roads	Rs.411 crore

The target for completion of these projects varies from two to five years.

The department proposes to evolve an integrated state-wise 'Toll Policy'. It is expected that collection of such tolls will contribute about Rs.50 crore annually with progressive increase in the subsequent year. On completion of these projects there will be smooth flow of traffic, lesser accidents, and a better connectivity. The Buildings and Roads Department will get projects executed by qualified A-Class contractors who have necessary road and bridge construction equipment.

Normally such ambitious programmes cannot be implemented through annual budgetary support. This innovative approach is intended to be financed with the assistance of national and international financial institutions and executed by experienced private agencies. The concept of 'users pay' is the cornerstone and this is a thoughtful approach for promoting 'public and private partnership' for speedy execution of state-level projects.

FINANCES OF PUNJAB STATE ELECTRICITY BOARD (PSEB)

The present financial position of Punjab State Electricity Board is a matter of concern. The current revenue of the Board is Rs.4,936 crore against its expenditure of Rs.6,814 crore. It has a current deficit of Rs.1,878 crore. This figure will increase to Rs.2,103 crore after payment of three per cent return on its paid up capital as ordered by the Hon'ble High Court of Punjab and Haryana. The cash deficit for the year 2001-2002 is likely to be Rs.738 crore, to be met through borrowings.

The decision of the government to allow 100 units of free power to the Scheduled Castes has resulted in an annual revenue loss of Rs.100 crore. The supply of free power to farmers of Punjab for agriculture is costing about Rs.1,200 crore to Rs.1,300 crore per year. The commitment of the state government in principle to partly subsidize power supply to the poorer sections and the farmers through budgetary support is a breakthrough for the State Electricity Board, even though compensation to it will be minimal. This, however, devolves a responsibility on the Board ultimately to make its working commercially viable, by eliminating or reducing inefficiencies and high losses in transmission and distribution. The per unit loss to the Board is given in Table 17.

Table 17
The Per Unit Loss of Punjab State Electricity Board

Years	Average Revenue Per Unit (Rs.)	Average Cost Per Unit (Rs.)	Per Unit Losses (Rs.)
1994-95	1.08	1.48	0.40
1995-96	1.25	1.60	0.35
1996-97	1.36	1.70	0.34
1997-98	1.48	1.97	0.49
1998-99	1.57	2.13	0.56
1999-2000	1.62	2.37	0.75
2000-2001	2.07	2.93	0.86

Source: *Economic Survey of Punjab, 1999-2000.*

The average power tariff covers only two-thirds of the unit cost. Despite the big shortfall in revenue and mounting losses, the Board has not taken measures to implement the Memorandum of Understanding (MoU) with the Central Government on metering 100 per cent of energy, its auditing and setting up profit centres.

With the continuing deterioration in the financial position of the Board it has not been possible for it to mobilize funds for its developmental schemes. The loans taken from financial institutions to the tune of Rs.1,216 crore in March 1997 have risen to Rs.4,450 crore in 2001-02. Further, default in servicing the loans from financial institutions, has barred the Board from future loans. On the other hand, the coal companies as well as the railways could reduce supply and handling of coal which could result in reduction in thermal generation. The non-payment of power purchased from the National Thermal Power Corporation (NTPC) and other undertakings could lead to the reduction of supply of power to the state.

Re-imposition of tariff on power for agriculture can ward off the present financial crisis of the Board. Free power supply for agriculture has been in operation since 13 February 1997 without compensation by the government except for a sum of Rs.250 crore in 2001-02. Cost of power being presently supplied at an average delivered rate of Rs.3.37 per unit is said to work out to around Rs.2,000 crore in 2001-02.

The Central Government is funding the Accelerated Power Development Programme (APDP) but the full benefit of the reforms is not being taken by the Board. The fate of ongoing schemes, particularly the 24 hours power supply scheme, hangs in balance for want of funds. About 85 per cent of the expenditure incurred by the Board on the scheme is yet to be reimbursed.

The state government entered into an agreement with the Ministry of Finance, Government of India, on 9 April 1999 agreeing to implement measures to improve the power sector by augmenting resources to meet its much needed investment requirements. Due to skewed power tariff and low returns, the national and multilateral financing agencies have shown reluctance to invest in the state power sector, thus putting the state at a critical disadvantage. It needs to implement the measures incorporated in the Common Minimum National Action Plan for power.

The thrust of the power programme should be to ensure adequacy of power supply as well as quality and reliability. At present Punjab is facing a shortage of 950 Megawatts in

terms of peaking demand and 4,800 million units on energy basis. The following projects are to be taken up during the Tenth Five Year Plan (Table 18), to meet this power shortage.

Table 18
Additional Power Generation in Tenth Five Year Plan

Name of Project	Capacity
GHTP Stage-II Lehra Mohabbat	2x 250 MW
Shahpurkandi (HEP) (Pb. Share 134.4 MW)	168 MW
MHP Stage-II(HEP)	16.5 MW
UBDC Stage-III(HEP)	30 MW
Micro Power House at GGSSTP Ropar	2 MW
Goindwal Sahib Thermal Power Station	2x250 MW

Source: Budget Document of Punjab 2002-2003

The institutional funds for these projects will be forthcoming only if the following steps are taken:

- a) Levy and recovery of energy charges on a cost plus basis.
- b) Reduction in transmission losses and avoidance of theft of electricity.
- c) Improving billing, etc., are the other components of reforms in the power sector to fully recover the cost of power. This will enable the PSEB to attract private investment in transmission and distribution to supply quality power at affordable prices.

There is need for immediate revision of tariffs for consumers --domestic and industrial, --re-imposition of agricultural tariff, release of subsidies to the Board and implementation of policy guidelines suggested by the Ministry of Power, Government of India. The Electricity Regulatory Authority should re-fix the tariffs as a major step to implement the reforms. If, due to political compulsions, economic tariff on power supply to agriculture could not be charged for the time being, a notional tariff of Rs.0.50 ps. per unit, as agreed in the conference of chief ministers, should have been charged until the recommendations of the State Electricity Regulatory Authority were available.

The present financial health of Punjab State Electricity Board calls for immediate revision of tariffs to save it from collapse. It proposes to engage a consultant to present its case for upward revision of tariff before the Punjab State Electricity Regulatory Commission, highlighting reasons which have caused the present precarious financial situation, which include inter alia, free power supply to the agricultural sector, Scheduled Castes and subsidized electricity supply to certain consumers. The Board will have to convince the Regulatory Authority about the genuineness of its intensions to implement measures to reduce manpower cost, theft of energy and improve the internal efficiency of the Board.

Punjab State Electricity Board (PSEB) has filed a petition before the Punjab State Electricity Regulatory Commission seeking tariff revision to offset the cash loss projected at Rs.950 crore and to ensure a three per cent rate of return (ROR) on the net value of the assets, as per the provision of the Indian Electricity Act. The proposal includes an increase of 25 per cent tariff for industries, 42 per cent for the domestic sector, two rupees per unit for tube wells having metered supply and Rs.240 per BHP for unmetered tube wells. The Electricity Board has worked out the per unit power generation cost at

Rs.3.50 for the year 2002, which has been contested by the industry in particular. The proposals of the PSEB are not supported by the state government, which has argued that the tariff revision sought by the PSEB was far in excess and not justified. The government has pleaded to the Commission that the cost of the inefficiency of the Board's management 'should not be passed on to the consumers'. The government is not prepared to provide help in the form of subsidy to the Board. It has promised to give budgetary support of only Rs.250 crore per year to subsidize power supply in part to the poorer sections of the society and fully to the small farmers. These issues have serious ramifications, including the responsibility of the Board to set its house in order by running it on professional and commercial lines. The commitment of the government to play its role and partly subsidize power supply to the poorer sections and small farmers, through budgetary support which is likely to be quantified by the State Electricity Regulatory Commission as the financial obligation of the state, will ensure compensation to the Board, even though in part, for subsidized power supply. This is indeed a step which might help ultimately to make the working of the PSEB commercially viable.

Just before the finalization, of this chapter the recommendations of the Punjab State Regulatory Commission were made public. The Commission has suggested a total subsidy of Rs.900 crore from Punjab Government to PSEB, leaving no uncovered revenue gap. The power tariff has been increased by 8 to 11 per cent for all categories of consumers and free-electricity to Schedule Castes has been reduced to 50 units per month. The farmer will pay 57 paise per unit for metered and Rs.60 per BHP for unmetered supply. The revenue from the farm sector as a result of this re-imposed tariff, is only Rs.297 crore.

DRAFT REPORT OF PUNJAB DISINVESTMENT COMMISSION

The Punjab Disinvestment Commission (Commission), set up by the state government has completed its draft report incorporating findings, conclusions and recommendations for inviting objections of the employees and public. The recommendations of the Commission are now on the website.

To expedite disinvestment and ensure transparency, fairness and equity, the government has decided to set up a Directorate of Disinvestment for processing the recommendations of the Commission. The final decision on disinvestment will be taken by the Cabinet Committee on Disinvestment under the chairmanship of the Chief Minister.

The state has provided Rs. 8,430 crore (Rs. 3,396 crore as share capital and Rs. 5,033 crore as loans) to 29 public sector undertakings (PSUs) and nine apex co-operative institutions (ACIs). In addition, a sum of Rs. 28,990.86 crore has been taken by these undertakings as loans against government guarantees. Direct involvement of the government is around Rs. 8,430 crore and liability for loans Rs. 28,990.86 crore. The number employed in PSUs is 1,18,624 persons, out of which 93,138 are employees of the Punjab State Electricity Board. Evidently, the problems of state undertakings are gigantic in terms of funds and job security of their employees.

In the era of liberalization, according to the Commission, the role of the government has considerably changed to that of a 'facilitator' for the creation of infrastructure for economic growth. It should, therefore, withdraw from its role as a 'participant'.

The Commission has recommended the setting up of Punjab State Asset Management Authority for implementing the decisions of the government, based on its recommendations. A draft legislation for setting up this Authority has been prepared with the help of professional consultants for the consideration of the Legislative Assembly. Taking into account the poor financial position of the state, disinvestments, or closing down of loss making PSUs, will help to reduce fiscal deficit and raise resources for investment, or to pay off the mounting debts of the state. It is proposed to effect fast-track disinvestment in Punjab Communications Limited, Punjab Alkalis and Chemicals Limited, Punjab Tourism Corporation Limited and PSIDC's holdings in Punjab Tractors Limited.

The Commission has recommend a 'One Time Settlement' (OTS) to take care of Non-performing Assets (NPAs) and other similar investments and for rescheduling term loans. The proceeds from disinvestment are to be placed in the 'Disinvestments Fund' managed by the Asset Management Authority. It will be utilized for financing restructuring, retrenchment, implementing the Voluntary Retirement Scheme (VRS) and for retraining and redeployment of employees of the PSUs. VRS disbursement or retrenchment compensation will be the first charge on the 'Disinvestment Fund'. Additional resources, if required, can be raised from financial institutions against the assets of PSUs transferred to the Asset Management Authority and through structural assistance from national and international institutions to provide a safety net to the employees. The report of the Disinvestment Commission has dealt with the winding up of companies, mergers or disinvestment of PSUs, administrative, financial and legal matters for the disposal of loss-making PSUs and ensuring a fair and equitable safety net for the employees who become surplus. The Commission has specifically suggested restructuring of PSEB, by right sizing the staff by offering VRS to, or retrenchment of surplus staff estimated at one-third of the present strength. It has suggested the corporatization of distribution of energy and then its privatization in small blocks.

There is no doubt that the implementation of the recommendations of the Commission, though well thought-out, will hit certain sections of industry and a large number of employees, but this is the only option before the state. Its current level of income generation and resources cannot provide sustenance to the employees, even if it is considered expedient to do so, because of the negative or inadequate output of the PSUs listed for disinvestment. However, the implementation of the recommendations will depend on a political consensus among the ruling and opposition parties. The suggestions invited by the Commission for its consideration should be sympathetically considered, to provide, as far as possible, alternative avenues of employment to the surplus or retrenched employees, so as to cause the minimal hardship to the community.

RECOMMENDATIONS ON WHITE PAPER ON STATE'S FINANCES

The White Paper on Finances of Punjab, a well documented and assiduously prepared paper issued by the Punjab Government, was discussed at a two day meet of eminent economists, financial experts, senior administrators of the state and professionals. The Chief Minister, Chief Secretary and Principal Secretary, Finance, Punjab, addressed the gathering.

It was pointed out that the fiscal stress, which affected the financial position of Punjab, began in 1984-85, when terrorism raised its ugly head. Since then, a downward slide in fiscal balances has continued and became significant and a matter of concern in the

years 1997 to 2002. Public debt rose to 47 per cent of GSDP (2001-2002), gross fiscal deficit to 6.92 per cent and revenue deficit to 5.48 per cent by the end of 2001-02 (RE). Revenue expenditure has been galloping and borrowed funds have been diverted to meet it instead of being invested in productive channels.

The tax base in Punjab continues to be narrow. The major sources of taxation are with the Central Government. At the same time, tax compliance in the state has been poor. It is on record that evasion of sales tax is high, estimated at over Rs. 2,000 crore per year, as against the actual assessment of about Rs. 3,000 crore per year.

Avenues of fresh taxation have not been identified, despite the fact that the consumption expenditure of the people of Punjab has shown an upward trend in the matter of purchase of luxury and white goods. A large number of eating houses and restaurants are doing good business but they are not in the tax net.

The ratio of tax percentage to GDP is lower than in the six fast growing states. This indicates that the state government has not taken steps to raise resources through strict enforcement of taxation measures.

Punjab still relies heavily on raising funds through the expensive route of small savings. With the reduction of interest rates, the state should swap expensive loans with cheaper funds now available due to reduction in interest rates.

Completion of the Thein Dam has been delayed resulting in a huge escalation in the cost of the project. Even now a very large number of its employees are receiving pay and allowances without doing any work. No decision has yet been taken either to absorb, retire or part company with them with a golden handshake.

The government has failed to ensure a minimum return of three per cent on the capital invested in the State Electricity Board. The Hon'ble High Court of Punjab and Haryana intervened and directed the state government to implement the law by ensuring payment of minimum return by the State Electricity Board. If it had to implement populist measures, like free electricity to the agricultural sector, proper accounting in the form of grants should have been adopted.

Panchayati Raj Institutions and urban local bodies are languishing and transfer of functions, powers and finances, despite concrete recommendations of the First and Second State Finance Commissions, have not fructified because of the reluctance of the political and government functionaries.

The state government, it was observed, has set up a Disinvestment Commission to suggest measures to recover locked funds to the tune of Rs.8,500 crore from the sick units, or make these commercially viable through mergers. This is one of the important measures to achieve reform. The funds so realized should, however, not be used to meet revenue expenditure but to pay off the ballooning public debt, or for reinvestment in regenerative schemes. There is a consensus that government should not be in business and this message guided the Disinvestment Commission while making its recommendations.

Local taxes levied by Municipal Councils are adequate to manage municipal affairs elsewhere in the world. However, municipalities in Punjab are shying away from levying

taxes and recovering user charges on a cost basis. It is time to learn from what is happening elsewhere. Municipalities should become vibrant and viable units of the third-tier government, marginally supported by transfers recommended by the State Finance Commissions or the Central Finance Commissions. The shortfalls if any should be met through public borrowings supported by bankable loan schemes.

Punjab has a distinct role in the field of agriculture. Therefore, it continues to be an agrarian economy with potential for export of its produce to other states. Punjab has a high per capita income growth due to its highest agricultural production in the country. This has led to a high consumption level with a multiplier effect on the growth of the local economy. There is no doubt that it is time that industrial production also grows appropriately, despite the logistic problem of a land-locked state.

The best option for Punjab is to implement its plan to double agricultural production through an extensive research and developmental programme. Commercialization of agriculture with the assistance of corporates is also workable. This can help consolidation of fragmented holdings.

Agriculture should, in due course, become self-sustaining without subsidies on fertilizers, water and electricity for running tube wells for irrigation. However, agricultural production should be made competitive in the coming years by withdrawing taxes on exports of foodgrains to other states. These include market fee, rural development fund fee and purchase tax. In a free market economy, the present burden of state taxes will make the agricultural produce of Punjab expensive in the very near future, considering the cost of transportation to the centres of consumption.

The government must take hard decisions. It is not necessarily higher taxation, but compression of expenditure, ensuring compliance of tax laws and plugging leakages through enforcement measures. Some steps in this direction have been taken by the state government recently. Downsizing of government has been in the air for some time. This laudable objective can only be achieved through political will and not through platitudes. For this purpose it will be desirable to arrive at a political consensus.

The urban poor continue to be a neglected lot and bear the brunt of total indifference. No policy has been formulated at the state level to take care of the urban poor, who constitute casual labourers, unskilled labourers, skilled workers, drivers, street-sweepers and domestic help. A large number of slum dwellers in the urban areas are engaged in such low-status and low-income jobs as rag pickers, self-employed vendors, hawkers, etc. Thousands of clusters have emerged in the urban areas of Punjab on encroached vacant lands, which are generally not authorized. Civic bodies, therefore, do not provide them with drinking water or drainage and health facilities. Low-lying areas with constant fear of floods, blocked drains, open defecation and littered garbage make the slum dwellers vulnerable to disease. The migrant population residing in slums are breeding places of crime. The silver lining for the slum dwellers is that they constitute the vote bank for the politicians on the eve of elections, in spite of which they continue to live in perpetual misery. Of late, special schemes have been formulated to provide such minimal civic services as water supply, community toilets, community centres and also vocational training programmes for upgrading skills of the youths and women of the slums. After training they are eligible for micro-loans to set up their own small business

enterprises, such as tea stalls, hawkers. Registered societies can be formed by women for taking loans and setting up tailoring, embroidery and other micro-level enterprises. The local municipality in each town has access to funds for such schemes and should arrange for training to upgrade skills of slum dwellers, so that, with the passage of time, they can join the mainstream of society in the urban areas as useful citizens.

The economy of Punjab cannot improve in isolation. It should be the outcome of political consensus. The growth of the economy has to depend on a long-term programme to be continued with the same tempo, zeal and favour, irrespective of the type or shade of the political party in power.

These observations in the foregoing paragraphs, made by experts invited by the Centre for Research in Rural and Industrial Development (CRRID), for a discussion on the comprehensive data given by the Finance Department in the White Paper to improve the financial health of the state, deserve serious consideration.

MEASURES FOR STABILIZING THE FINANCIAL POSITION OF PUNJAB

Punjab's economy decelerated during the 1990s after recording the fastest growth in the 70s and mid-80s. Factors which seem to have adversely affected the state's fiscal situation over the past 15 years are high salaries and wage bill, mounting debt burden, heavily subsidized social and economic services, slow growth of revenue and loss-making PSUs. The quality of governance suffered and so did the quality of expenditure over these years. Large-scale persistent absenteeism among teachers of government schools, particularly primary schools in rural areas, and doctors of primary health centers, has considerably affected the delivery of two vital social services.

There is need to restructure the tax collection mechanism and plug leakages in revenue collection from sales tax, stamp duty and motor vehicle tax. Revenue from sales tax can grow to Rs.6,000 crore, stamps duty to Rs.1,000 crore and motor vehicle tax income to Rs.700 crore per year over the next four to five years. The Finance Minister has partly mentioned this in his budget speech.

As stated earlier the state is relying on raising funds through the expensive route of small savings. The swapping of costly debt including small savings with cheaper debt, a reduction in the current expenditure level and minimum reliance on borrowings, are the other measures for reducing the fiscal stress of the state. At present, almost one-third of the state's own revenue takes care of yearly payments of interest on borrowings.

There are social and service organizations specializing in the promotion of education and providing health care to the poor and needy. They should be welcomed to deliver such high-cost social services as education and health. Delhi State has under consideration a scheme to transfer infrastructural facilities of schools, which have consistently shown poor results, to private organizations. The Madhya Pradesh Government has initiated a scheme to involve non-governmental organizations to run government hospitals/clinics in districts, through 'Rogi Kalyan Samitis'. They are authorized to levy and collect a service charge from patients and use it for buying medicines, etc. The poor and deprived sections of the society are assured a minimum level of service. The government is responsible for payment of salaries to teachers/doctors, but the revenue expenditure is taken care of by the private organizations. A government-nominated regulatory authority should ensure quality of

service and exercise control by obtaining audited balance sheets and reports of income and expenditure. Capital grants to schools and hospitals for adding equipment continue to be borne by government.

The achievement of sustainable development, combining economic development, social development and environment protection is the key challenge before government. It entails balancing economic, social and environmental objectives of the society and integrating them as far as possible. Allocating a higher share of public spending to physical- and human-capital formation would help promote growth. Roads and similar infrastructure increase the productive capacity of the state. A better-educated and healthy population contributes to growth as it boosts work and productivity. The fiscal policy of government, ranging from taxing and spending decisions, has an important effect on sustainable development. A prudent, sustainable fiscal policy promotes economic growth. In the long run a low and stable level of government deficit and debt are typically associated with economic growth. Over the long run fiscal policy should keep fiscal deficit and debt at a sustainable level.

Punjab is faced with a dismal and unsustainable fiscal situation (March 2002) as summarized below:

- Revenue deficit is Rs.3,842.00 crore. It is 5.48 per cent of GDP
- Gross fiscal deficit is Rs.5,211.00 crore. It is 6.92 per cent of GDP
- Public Debt at Rs.3,3037.46 crore is 47.16 per cent of GDP
- Annual interest liability at Rs.3,149.00 crore accounts for 32.71 per cent of the state's revenue
- Salaries and pensions at Rs.5,890 crore per annum account for 74.30 per cent of the state's revenue
- Budgetary provisions for education and health are largely consumed by salaries and establishment expenditure
- This situation can result in default in payment of salaries and pensions to the employees and debt servicing, and in further deterioration in the quality of socio-economic services
- With this background it is not possible to approach multilateral funding agencies, financial institutions and capital markets for funding development programmes
- The government will not be able to access funding under the Centrally Sponsored Schemes in the absence of desired sectoral reforms and its inability not only to contribute its own share but to even release funds received from the Central Government
- Funds received from financial institutions, Government of India and even a part of the Cash Credit Limit for procurement of foodgrains have been diverted to defray revenue expenditure

Therefore, corrective measures should be taken to maintain the essential services, including power, water supply, health, primary education, scavenging and sanitation. Immediate attention should be paid to correcting the revenue/fiscal deficit and substantially reducing public debt. The measures required are:

- i) Fiscal deficit, which at present is around seven per cent of GDP be reduced to 3.5 per cent by the end of 2007

- ii) Revenue deficit be reduced by 0.5 per cent per annum with 1999-2000 as the base year and reduced to zero by 2007
- iii) Public debt as a percentage of GDP be reduced from 47.16 per cent currently to 25 per cent by 2007
- iv) Committed expenditure, which is 112 per cent of the revenue, should be reduced to 60 per cent by 2007
- v) Self-imposed discipline to stop issuing future government guarantees and creation of a Sinking Fund for guarantees
- vi) These fiscal targets should be broken up into annual targets and implemented, beginning with the budgetary proposals for the year 2002-03. In addition, action has to be taken for:
 - a) Restructuring major departments for identifying redundant functions and functionaries.
 - b) Employees so identified, or who become surplus after completion of projects, should be transferred to a common surplus pool, to meet future manpower requirements. This may require re-training of the surplus employees.
 - c) A blanket ban on the creation of new posts and on recruitment be imposed. In addition, all posts lying vacant or falling vacant may be abolished.
 - d) A voluntary retirement scheme (VRS) on the pattern of that of the Government of India should be framed and notified. The scheme should be applicable to employees declared surplus.
 - e) The Finance Department of the state at one time held that financial institutions could fund this one time cash outflow. The Planning Commission holds that funding by banks/financial institutions may not be possible as such outgo essentially relates to revenue expenditure. It has suggested the establishment of a State Renewal Fund on the pattern of the National Renewal Fund to finance this type of cash outgo. The World Bank and international institutions have provided assistance to several countries for structural reforms for downsizing the bureaucracy. These institutions insist on quick disbursement of assistance, no re-hiring of retrenched staff and sticking to the reduced level of bureaucracy.
 - f) The benefit of automatic promotion after four, nine, 14 years of service, enjoyed by nine categories of employees, should be withdrawn and every employee should be covered under eight, 16, 24, 32 years scheme.
 - g) Employees appointed in government service, beginning 1 July 2002 should be entitled to contributory pension.
 - h) Grant-in-aid to educational institutions above school level should be phased out in a period of five years. However, capital grants in place of deficit grant should be substituted so that the quality of service does not suffer.
 - i) All fresh recruitment, including for projects, should be on a contract basis. This restriction should be initially for a period of five years.

The route of raising funds from the capital market through bonds, adopted by the Punjab Infrastructure Development Board, should be extended to other areas. A bankable project report for implementing construction of railway overbridges, road upgradation, widening of link roads in border districts by Public Works Department, is a step in this direction. It is proposed to formulate an integrated state-wide toll policy to defray repayment of the loans in part or full. Normally such ambitious programmes cannot be implemented through annual budgetary support. The new approach is intended to be financed by national and international financial institutions and executed by private agencies. The concept of 'user pays' is a thoughtful approach for promoting public-private partnership in such big projects.

There is now a provision in the Central budget offering reform-linked assistance to states, amounting to a total of Rs. 12,300 crore in such areas as Accelerated Power Development Reform Programme, Accelerated Irrigation Benefit Programme, Urban Reform Incentive Fund and Rural Infrastructural Development Fund. In addition, a lumpsum amount of Rs.2,500 crore has been provided for reforms of policies constraining growth and development. The state has the opportunity to avail of assistance by resorting to developmental measures in specified areas of chronic deficiencies.

According to a recent report (31 July 2002), the Meteorological Department has categorized the ongoing drought as 'severe', with monsoons 30 per cent below normal. Failure of the monsoons to this extent occurred thrice in the last century, i.e., in 1917, 1972 and 1987. Rainfall deficiency was 26 per cent in 1987. The monsoon situation has worsened this year with an average deficiency of 30 per cent upto 31 July 2002. The failure and uneven distribution of the monsoon in Punjab has resulted in the loss of the kharif crop, particularly paddy. The state government has the responsibility of undertaking relief and rehabilitation measures. The Eleventh Finance Commission has laid down that the Calamity Relief Fund should be used for meeting expenditure for providing immediate relief to the victims of drought. The drought situation in a few other states, particularly in North India, is equally grave. If there is further loss of the kharif crop, funds required for relief and rehabilitation will mount and the Central Government may levy a 'special surcharge' on 'central taxes' in consonance with the recommendations of the Eleventh Finance Commission. This should enable the state government to draw on this fund in addition to the calamity fund provided in its budget for 2002-03.

The budget for the year 2002-03 has a number of positive policy statements to improve the financial health of the state and additionally to ensure accountability and transparency. These are:

- Fiscal responsibility and better budget management
- Corrective measures for restoration of the financial health of the state
- Improving quality of public expenditure
- Development of infrastructure
- Diversification of agriculture
- Power sector reforms and improving the finances of the PSEB
- Industrial revival
- Urban and rural renewal through devolution of funds and functions to the urban local bodies and the Panchayati Raj Institutions

- Improvement in the quality and delivery of education and health services
- Welfare of Scheduled Castes, Backward Classes and other weaker sections of the society
- Aggressive disinvestment in public sector undertakings

Another feature of the budget for 2002-03 is that it is a three-year rolling budget to ensure consistency and continuity. This concept of a three-year rolling budget is a medium-term fiscal reform programme prepared by the government. In addition, the state government will prepare an 'Action Taken Report' (ATR) on the announcements made in the budget and place it on the table of the House each subsequent year, so that the sincerity and performance of the government can be assessed by the legislature.

MEDIUM TERM FISCAL PROGRAMME

The state has to play an exclusive role in strengthening the physical infrastructure and human development in order to be a favoured destination for private investment. The challenge of fiscal management in Punjab is rather acute and serious. Some measures have been taken to bring down non-productive expenditure to improve the fiscal situation. The declining share in central taxes and duties, as a percentage of GDP and the comparatively low growth in the state's own tax revenues, mounting public debt, guarantees for loans raised by the public sector undertakings and high committed-expenditure of government suggest the development of a medium-term framework to control the inflow and outflow of the state's expenditure. The Medium Term Fiscal Reform Programme drawn up by the state government, by resorting to a 'rolling budget', is a step in the right direction.

A medium-term fiscal policy statement of Punjab should provide an institutional framework focused on the need to bring down the fiscal deficit, control the growth of public debt and improve the effectiveness of the government in the delivery of goods and services. In such a situation, the government should adopt a fiscal policy in the annual budget showing how the current policies are in conformity with the objectives of the medium-term fiscal plan as defined in the current budget. This includes reduction in revenue deficit as a percentage of total revenue receipt, reduction in fiscal deficit as a percentage of GDP and growth in yield from major taxes such as sales tax, stamp and registration, motor vehicle tax and non-tax revenues and savings from compression of expenditure. The medium-term fiscal plan, approved by the state legislature in the budget session, is a document which provides for surpassing the performance of previous years and monitoring the progress of reforms. The medium term fiscal plan will adhere to the norms laid down in the Draft Fiscal Responsibility Act to ensure control of deficit/borrowings. The Medium Term Fiscal Plan financial terms of this plan for 2002-03 to 2004-05, as prepared by the state government is shown in Table 19.

These reforms, namely, Medium Term Fiscal Plan and the Fiscal Responsibility Legislation introduced in the budget session of 2002-03, should lead the state to a path of high growth.

Table 19
Punjab Medium Term Fiscal Plan (Rs. in crore at current prices)

Item	200-01 Accuts.	2001-02 RE	2002-03 BE	2003-04 Proj.	2004-05 Proj.
Tax Revenue	5614	5575	6423	7148	7955
1) Own tax revenue	4896	4967	5719	6348	7046
2) Shared taxes	717	608	704	800	908
Non-tax revenue	3762	4050	6047	6181	7005
1) Own non-tax revenue	2935	3133	4424	5065	5789
a) PSEB interest receipts	605	448	603	680	767
b) Lottery	1671	2091	3066	3458	3901
C) Others	659	594	755	927	1120
2) Grants	827	917	1623	1116	1217
Total Revenue Receipts	9376	9625	12470	13329	14960
Revenue Expenditure	11713	13467	15964	16261	17354
a) Interest payment	2343	3149	3211	3769	4234
b) Salaries and wages	4287	4888	5054	5155	5355
c) Grants in aid to universities	241	256	265	265	265
d) Pension and retirement benefits	1116	1010	1027	1232	1479
e) Other expenditure	3726	4164	6407	5840	6020
1) PSEB	605	448	603	680	767
2) Lottery	1636	2021	2956	3334	3761
3) Others	1485	1695	2848	1825	1492
Revenue surplus/deficit(+/-)	-2337	-3842	-3495	-2932	-2394
Capital expenditure (incl.Net Loans & advance)	1567	1415	1952	1300	1600
Fiscal Deficit	-3904	-5257	-5447	-4232	-3994
Revenue deficit/revenue Receipts (%)	-24.9	-39.92	-30.00	-22.00	-16.00
Revenue deficit/GSDP(%)	-3.41	-5.06	-4.15	-3.13	-2.30
Fiscal deficit(%)	-5.70	-6.92	-6.46	-4.52	-3.84
GSDP	68448	75977	84335	93612	103909

Source: Punjab Budget Document: Medium Term Fiscal Programme, June 2002

The Punjab Fiscal Responsibility and Budget Management Bill, 2002 is proposed to ensure intergenerational equity in fiscal management and long-term financial stability of the state, by eliminating fiscal deficit. Debt management of the state will be optimally maintained to achieve fiscal sustainability, by putting caps on state government borrowings, debt and deficits. The fiscal policy in a medium-term framework will be in tune with the long-term interests of the state to achieve a revenue surplus for investment purposes.

Quarterly Statement of Income-expenditure

For the sake of transparency and accountability the state Finance Department should compile a quarterly statement of its income-expenditure for wide circulation. The reasons for excess or shortfall in income and expenditure should be recorded in the statement for circulation to the legislature, public and academics for information and feedback. These reform measures hold a promise to improve the financial position of the state in the coming years.

Accessing Foreign Assistance

The newly ushered-in government has initiated a laudable effort to compress expenditure substantially. It has made known its intention to reduce the revenue deficit, the fiscal deficit and the burden of borrowings.

The level of deficit and market borrowing is so high as defy government efforts to achieve their targets, unless easy external funds for budgetary support are identified and procured. In the state budget for the year 2001-02 emphasis is on fiscal reforms and the consolidation process. The focus is on augmenting tax and non-tax revenue receipts and containing expenditure to reduce revenue expenditure as shown in Table 20.

Table 20
Growth Rate of Revenue and Expenditure Receipts for the Year 2001-02 & 2002-03
(Rs. in Crore)

Items	Years				
	2000-01 (Accts)	2001-02 (R.E)		2002-03 (B.E)	
	Amount	Amount	Growth Rate in (%)	Amount	Growth Rate in (%)
1. Tax revenue	5614	5574	-0.71	6423	15.22
2. Non-tax revenue	3762	4050	7.65	6047	49.30
3. Total revenue receipts	9376	9625	2.65	12470	29.55
4. Revenue expenditure	11,713	13467	14.97	15964	18.54

The government has embarked on a number of corrective measures to restore fiscal stability, which is an important indicator of fiscal prudence in the medium term. Fiscal measures incorporated in the budget include right-sizing the government, compression of non-productive expenditure, revision of user-charges and higher yield from traditional sources, such as sales tax, registration and stamp duty and motor vehicles tax through strict enforcement measures.

Institutional measures to improve the fiscal health include setting up a Public Expenditure Reforms Commission and a Public Sector Disinvestment Commission. Important sectoral measures include emphasis on research and development in the agricultural sector to achieve substantially higher agricultural production, strengthening small and medium enterprises, focus on information technology and bio-technology and

diversification of the cropping pattern, particularly the persisting wheat-rice rotation, through incentives and technological support. Other measures include operationalization of the State Electricity Regulatory Commission to determine electricity tariffs in a rational manner, and the Infrastructure Development Board to access market funds through 'bonds' for fast-track infrastructure development.

With these extensive reform measures, it should be possible to access budgetary support from the World Bank (WB), provided the approach to it is supported by a 'Project Report' highlighting the state's development and poverty alleviation programmes. The WB prepares a Project Report at its own cost. Ordinarily the World Bank and other international institutions look forward to support development plans, which are growth-oriented and self-sustaining in the long run. The other states facing similar fiscal problems have actually approached the WB for long-term financial assistance from it and such requests are under consideration.

The WB, it is understood, is sending a team to Punjab for appraisal and assessment of the financial requirements of the state for supporting water supply, sewerage and sanitation programmes in urban areas, water supply in rural areas and road network upgradation programme, in the light of the fiscal reforms initiated and incorporated in its budgetary proposals. Financial support should be forthcoming, if fiscal reform measures announced in the budget are implemented by developing a transparent policy for levying and collection of user-charges for the commercial services provided by the state.

Several multilateral development banks, including the World Bank and the Asian Development Bank, have developed guarantee schemes. The WB facilitates access by developing countries by lengthening the maturity of related borrowings. This provides ample opportunity to approach international funding agencies, seeking funds for infrastructure-related projects based on a cash flow statement, without the direct backing of the state government. The World Bank also issues guarantees for project financing, under the Extended Co-financing Facility, to cover sovereign risks associated with infrastructure projects. This facility is designed to improve access of the developing countries to international capital markets.

The reforms undertaken by the state government in all areas of fiscal management, in line with the national policy, should restore the fiscal health of Punjab. This includes, user-charges on commercial services, to access institutional funds for fast-track infrastructure development.

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Chapter 4

DEVELOPMENT OF AGRICULTURE AND ALLIED SECTORS

INTRODUCTION

Punjab has entered the new millennium with problems in the agriculture sector. During the mid-nineteen-sixties, the green revolution transformed the states agriculture and contributed significantly in making the country self-reliant in food. The increase in production and productivity of wheat and rice in the state is legendary in the history of agriculture in India. These achievements presented a rosy picture of agriculture in Punjab until recently, as the achievements of the state in agriculture have run out of steam. Growth rates in agricultural production and productivity are stagnating and profitability in farming progressively getting reduced. Sustainability in agricultural production and the natural resource base are under threat, as warnings have been sounded on over-exploitation of land and water resources, and degradation of the environment and ecology. The technology base, which led to the green revolution, is not expanding any more. Alternative growth paths need to be explored to expand the growth potential of the state.

Punjab is endowed with abundant resources and an enthusiastic farming community, which has resulted in increase in grain-production from 73 lakh tonne in 1970-71 to 253 lakh tonne in 1999-2000. The state contributed in 1999-2000, around 50 per cent to the Central Pool Stock of wheat and rice. Cropping intensity in Punjab is currently more than 185 as against 133 in the country as a whole, and consumption of fertilizer (NPK) is 184 kilogramme per hectare as compared to the Indian average of 70 kilogramme per hectare. About 18 per cent of the total tractors in India are in Punjab. Production is supported by about 94 per cent irrigation coverage with 9,35,000 tube wells. Some of the selected indicators of development in agriculture are given in Table 1.

The fast-track adoption of production-augmenting technologies has led to several growth-related problems on the economic, social and environmental fronts in Punjab agriculture, so much so that the sustainability of wheat-paddy rotation is being doubted and debated.

Today, Punjab is at the crossroads, as the existing production pattern and marketing systems are out of tune with the immediate and long-term supply and demand situation in both national and international markets. A package of dynamic, pro-active and responsive policies and action programmes are required to revive Punjab agriculture, so as to meet the oncoming pressures of free trade, liberalization and globalization.

IMPLICATION OF CHANGES IN AGRARIAN STRUCTURE

Since the introduction of the green revolution technology, the agrarian structure of Punjab has witnessed interesting changes. In the first phase covering upto 1980-81, the number of marginal and small holdings declined sharply, while those in the higher-size categories showed a modest increase. These changes occurred primarily due to three reasons. First, with the onset of the green revolution technology, crop production activities became economically attractive, which created an active land-market for

leasing and selling land. Secondly, progress of agriculture under the green revolution technology created additional employment opportunities in the non-farm sector. These encouraged many marginal farmers either to sell their land or lease it, to earn higher incomes from non-farming jobs. Finally, the new technology turned out to be more attractive to the large farmers, mainly because the mechanical inputs associated with it were indivisible, and thus uneconomic for use in smaller-size farms.

Table 1
Some Selected Indicators of Growth of Punjab Agriculture

Indicator	1970-71	1980-81	1990-91	1999-2000 ^(p)	2000-01 ^(p)
Wheat production (MT)	5.1	7.7	11.7	15.9	15.5
Wheat yield (kg./ha.)	2238	2730	3715	4696	4563
Rice production (MT)	0.7	3.2	6.7	8.7	9.2
Rice yield (kg./ha.)	1765	2733	3229	3347	3506
Total foodgrains (MT)	7.3	11.9	20.0	25.2	25.3
Total foodgrains yield (kg./ha.)	1860	2456	3391	4032	4033
All commodities production index (triennium ended 1969-70=100)	109.76	170.23	269.55	321.72	332.59
Cropped area irrigated (%)	71	81	94	94	94
Nutrient (NPK) use (kg./ha.)	38	113	163	184	179
Total tube wells ('000)	192	600	800	925	935
Total tractors ('000)	30	119	265	365	-
Gross cropped area (m./ha)	5.7	6.8	7.5	7.8	7.9
Net cropped area sown (m./ha)	4.0	4.2	4.2	4.2	4.3
Cropping intensity (%)	140	161	178	185	186
Total cultivators ('000)	1665	1767	1917	-	-
Total agricultural labourers ('000)	787	1105	1452	-	-
Share in total main workers (%)	20.11	22.83	23.82	-	-

Source: *Statistical Abstracts, Punjab, various issues.*

Note : (P) - Indicates provisional estimates

In the second phase beginning from 1980-81, when profitability in farming started falling and growth of employment opportunities in the non-farm sector became limited, the absolute number of holdings in the state increased, even with a significant decline in the total operated area. Consequently, the average holding size in the state fell sharply from 4.07 hectare in 1980-81 to 3.61 hectare in 1990-91 (Table 2). All except the small farmers registered a decline in average land-holding size. The number of marginal farmers increased steeply from 1,97,000 in 1980-81 to 2,96,000 in 1990-91 (an increase of more than 50%), while their operating land base, during the same period, increased from a total of 1,26,000 hectare to around 1,64,000 hectare (i.e., an increase of about 30%). Small farms too increased but marginally, with more than a proportionate increase in their total operated area, primarily due to progressive subdivision of medium and large farms under the law of inheritance.

Table 2
Comparative Statement of Operational Holdings in Punjab

Size class	1980-81			1990-91			1995-96		
	No. of holdings (000)	Area operated (000)	Area size of holding	No. of holdings (000)	Area operational (000)	Area size of holding	Size class	No. of holdings (000)	Area operated (000)
Marginal (< 1ra)	197 (19.22)	126 (3.02)	0.64	296 (26.50)	164 (4.07)	0.55	204 (18.66)	122 (2.94)	0.60
Small (1-2 ra)	199 (19.41)	291 (6.98)	1.46	204 (18.26)	328 (8.13)	1.61	183 (16.74)	240 (5.79)	1.31
Medium (2-4 ra)	287 (28.00)	841 (20.16)	2.93	289 (25.87)	841 (20.86)	2.91	320 (29.28)	833 (20.08)	2.60
Large (4-10 ra)	269 (26.25)	1672 (40.09)	6.22	261 (23.37)	1622 (40.23)	6.21	306 (28.00)	1754 (42.30)	5.73
Extra Large (> 10 ra)	73 (7.12)	1241 (29.75)	17.00	67 (6.00)	1077 (26.71)	16.07	80 (7.32)	1198 (28.89)	14.98
Total	1025 (100.00)	4171 (100.00)	4.07	1117 (100.00)	4032 (100.00)	3.61	1093 (100.00)	4147 (100.00)	3.79

Source: Statistical Abstracts, Punjab, various issues.
1995-96 data are obtained from Department of Agriculture, Punjab Government

Note: Number in parenthesis is percentage to the total

These negative developments in Punjab agriculture appear to have been slightly arrested now. Data from the 1995-96-agriculture census indicated that the average holding size in the state had improved to nearly 3.80 hectare, though it still remained considerably below the level attained in 1980-81. However, except marginal and small farms, all other categories of farms have considerably increased. As a result, the average operating land base for all categories of farms has declined, except for the marginal ones. Apparently, the serious unemployment situation in the state has had a telling effect on its agrarian structure.

More recent changes in the structure of ownership and operational distribution of land-holdings, apart from the land-lease market, etc., has been reported in a PAU study published in 2001*. It reveals:

- Farmers with small and medium-size holdings leased in more area to make gainful use of their farm resources.
- The employment of adult male members of farming families in off-farm jobs were on the increase, with 1.37 per cent supplementing their income through off-farm labour, 3.98 per cent in other business, 13 per cent by service in public and private enterprises and 20 per cent in other occupations.
- The modal land rent worked out to Rs. 17,500 per hectare. The lease contracts were mainly verbal, in cash and for one year. The land-lease market did not conform to the provisions of existing legislation, but it was observed to be working more or less to the satisfaction of both leasers and leasees.
- Land sale was more by the small and marginal farmers, mostly because of distress due to their inability to support their farms.
- The average price of land increased from Rs. 41,675 per hectare in 1985 to Rs. 3,04,775 per hectare in 1999. When deflated with the price index, the price of land was still increasing, showing thereby that the land market has been inflationary.
- The practice of mortgaging land among farmers is on the decline. Only about one per cent of the total operational area was under mortgage.

* Joginder Singh, "Changing Structure of Land Market in Agrarian State of Indian Punjab", *Productivity*, 2001, National Productivity Council, New Delhi.

The distribution of land in three sub-regions of the state revealed that during 1991, the average size of holdings in the sub-mountain region was 2.53 hectare, 3.70 hectare in the central region and 3.79 hectare in the southwest region (Table 3). The size-class distribution of holdings in various districts revealed that concentration of small and marginal farmers was the highest in the sub-mountain region, while concentration of large and medium farmers was the highest in the southwest region. Central districts were at the top in concentration of semi-medium holdings.

Table 3
District-wise Trends in Number and Size of Operational Holdings in Punjab, 1971-1991

Region/District	Total holdings ('000)			Average size (Ha)		
	1971	1981	1991	1971	1981	1991
Sub-Mountain Region						
Rupnagar	65	49	54	1.84	2.61	2.09
Hoshiarpur	148	94	98	1.65	2.69	2.64
Gurdaspur	123	100	113	2.11	2.60	2.64
Sub-total	336	243	265	1.85	2.63	2.53
Central region						
Patiala	84	79	96	4.63	4.95	4.05
Ludhiana	91	74	83	3.46	4.44	3.91
Jalandhar	116	75	86	2.44	3.99	3.41
Kapurthala	53	35	39	2.49	4.19	3.63
Amritsar	187	115	124	2.08	3.64	3.52
Sub-total	531	378	428	2.84	4.19	3.70
South West region						
Sangrur	108	90	102	4.16	5.13	4.49
Bhatinda	107	91	102	4.79	5.53	4.80
Faridkot	136	114	107	3.67	4.60	4.83
Ferozepur	158	111	112	2.94	4.46	4.51
Sub-total	508	406	424	3.78	4.89	4.66
Punjab	1375	1027	1117	2.95	4.10	3.79

Source: *Statistical Abstract of Punjab*, various Issues

The present state of agrarian structure points to the fact that marginal and small-size farming, though the largest in numbers, are fast becoming unviable. With increasing pressure on land for more production per-unit area through adoption of modern technologies and use of capital inputs, marginal and small farmers are unable to keep pace with the rapid technological advances in crop production. The scarcity of employment opportunities in the non-farm sector and increasing indebtedness due to increase in cost of inputs, have made the survival of small and marginal farmers difficult. With growing market demand for quality produce, suitable technical and credit support needs to be given to marginal and small farmers, to upgrade their skills for the production of quality goods. Given the preponderance of a large number of marginal and small farms in the state, the strategy for agricultural production should give more attention to meet their specific requirements. Extension services should re-orient the target approach so as to cater to the ever increasing numbers of marginal and small farmers. Besides, appropriate policies have to be designed to generate more off-farm employment opportunities.

PROBLEMS OF CONCENTRATION IN CROP PRODUCTION PATTERN

Wheat-rice rotation implications: The strategy for increasing agricultural production followed in Punjab was based on putting large cultivated areas under wheat and rice; use of high yielding seeds, water and fertilizers; and efforts to improve input-use efficiency for reducing the cost of production. The centre encouraged to pursue this strategy, to enhance foodgrains production, particularly wheat and rice, for meeting the emergent food situation in the country, especially during the seventies and eighties. Consequently, the production of foodgrains in Punjab rose more than seven times, from 3.16 million tonne in 1964-65 to 25.30 million tonne in 2000-01. Besides, high yielding seed varieties, consolidation of land-holdings, expansion of irrigation facilities especially lifting the ground water through tube wells and pump sets, higher use of chemical fertilizers, farm mechanization, development of produce markets, power and road infrastructure, easy availability of credit, strong research and extension support, favourable inputs and output prices -- all contributed to raising agriculture production significantly. However, over time, the wheat-rice rotation, now covering over 60 per cent gross of sown area, has created problems of serious consequences, some of which are:

- Both the crops are water-intensive, thus leading to large-scale depletion of groundwater in many areas.
- Both crops are heavy consumers of macro- and micro-nutrients, thus degrading the soil.
- The wheat-rice rotation adversely affects physical characteristics of the soil as, due to puddling for paddy, an impervious layer is formed in the soil, which does not allow root-penetration to deeper layers, thus restricting nutrient use.
- The wheat-rice rotation consumes heavy doses of fertilizers, pesticides and weedicides, which create ecological problems of environmental pollution, fauna and flora imbalances, and builds up residual toxicity in soil, water and air.
- The spread of monoculture of wheat and paddy has rendered these crops vulnerable to pest and weed attacks, thus making them more susceptible to pests and diseases.

The widespread practices of wheat and paddy crop rotation has caused considerable harm to the natural reserves and need to be altered quickly, lest the damages become irreversible.

Changes in cropping pattern: The green revolution brought significant changes in the cropping pattern of Punjab. In 1970-71, about 41 per cent of the gross cropped area was under wheat, which increased to nearly 44 per cent in 1990-91, and hovered around 42-43 per cent thereafter. Similarly rice, which occupied around 6.8 per cent of the gross cropped area in 1970-71, increased to over 25 per cent in 1990-91, and then rose further to around 33 per cent in 2000-01. The increase in wheat cultivation has been at the cost of gram, rapeseed and mustard, while that of rice has been obtained by shifting the area from maize, groundnut and millets. Areas under legumes and forage crops too have declined considerably. Areas under such crops as sugarcane, sunflower, potato, etc., have not remained stable (Table 4). Area under cotton has been adversely affected due to inclement weather and pest attack. It is, however, encouraging to note that productivity of most crops have been increasing over the years except for bajra (Table 5).

Table 4
Shift in Cropping Pattern in Punjab (Area in' 000 ha.)

Crop	1970-71	1980-81	1990-91	1999-2000	2000-01
Rice	390 (6.87)	1183 (17.49)	2015 (26.86)	2604 (33.18)	2612 (32.92)
Maize	555 (9.77)	304 (4.50)	183 (2.44)	163 (2.08)	164 (2.07)
Bajra & Jowar	212 (3.73)	70 (1.03)	12 (0.16)	5 (0.06)	6 (0.08)
Groundnut	174 (3.06)	83 (7.23)	11 (0.15)	5 (0.06)	4 (0.05)
Cotton (American)	212 (3.73)	502 (7.42)	637 (8.49)	381 (4.86)	358 (4.51)
Sesamum	15 (0.26)	17 (0.25)	18 (0.24)	145 (1.85)	19 (0.24)
Sugarcane	128 (2.25)	71 (1.05)	101 (1.35)	108 (1.38)	121 (1.52)
Kharif pulses	33 (0.58)	58 (0.86)	73 (0.97)	51 (0.65)	42 (0.53)
Wheat	2299 (40.49)	2812 (41.58)	3273 (43.63)	3388 (43.18)	3408 (42.95)
Barley	57 (1.00)	65 (0.96)	37 (0.49)	51 (0.65)	32 (0.40)
Gram	358 (6.30)	258 (3.81)	60 (0.80)	6 (0.08)	8 (0.10)
Rapeseed & Mustard	103 (1.81)	136 (2.01)	69 (0.92)	56 (0.71)	55 (0.69)
Potato	17 (0.30)	40 (0.59)	23 (0.31)	76.0 (1.00)	64 (0.81)
Other vegetable	23 (0.41)	24 (0.36)	31 (0.41)	47 (0.60)	46 (0.58)
Fruits	50 (0.88)	29 (0.43)	69 (0.92)	30 (0.38)	34 (0.43)
Net Sown Area	4053	4191	4218	4243	4264
Total Cropped Area	5678	6763	7502	7847	7935
Cropping Intensity	140	161	178	185	186

Source: Statistical Abstract, Punjab, 1971, 1981, 1991, 2000 and 2001

Note: Figures in parentheses indicate area under crops as percentage share to total cropped area

Area under pulses has recorded a sharp decline. Gram, which used to be the most important pulse crop in the state during the sixties, declined from a level of nearly 3,60,000 hectare in 1970-71 to less than 10,000 hectare in 2001. Yield of gram, which stagnated till 1990-91, has started improving, though it has not yet become attractive enough to arrest the decline in its area and production.

Table 5
Yield (kg./ha.) of Principal Crops in Punjab

Crop	1970-71	1980-81	1990-91	1999-2000
Wheat	2238	2730	3715	4696
Rice	1765	2733	3229	3347
Maize	1555	1602	1786	2577
Barley	1022	1640	2754	3521
Gram	797	582	744	974
Bajra	1176	1244	1107	703
Sugarcane (Gur)	4117	5526	5941	6265
Cotton (American)	399	329	481	337
Cotton (Desi)*	338	241	285	352
Rapeseed & Mustard	553	567	1003	1117
Groundnut	970	1249	816	969

Source: *Statistical Abstract, Punjab, 1971,1981,1991 and 2001.*

Note: * In term of lint

An examination of district-wise data reveals an interesting pattern in the variabilities in crop yield levels (Table 6). Crops, which have now become important in the state, such as wheat, rice, cotton and sugarcane, have generally lower inter-district variability in their respective crop yields than those, which have been marginalized, such as oilseeds, pulses, bajra and maize. For instance, wheat yield ranges from a low of 3,500 kg per hectare in Hoshiarpur district to a high of nearly 5,150 kg per hectare in Fatehgarh Sahib district. Similarly, rice yield varies from around 2,800 kg per hectare in Gurdaspur district to a high of nearly 3,700 kg per hectare in Fatehgarh Sahib district. In the cotton-growing districts, yield has been fluctuating in a narrow range around an average of 340 kg per hectare. However, the yield of oilseeds, cultivation of which has been marginalized in the state, has recorded wide variations, from as low as 738 kg per hectare in Gurdaspur district to as high as 1,388 kg per hectare in Fatehgarh Sahib. Yield level of pulses, bajra and maize crops, which have too been marginalized in the state, has recorded wide inter-district variations.

Table 6
District-wise Productivity of Crops (1999-2000) (Kg per hectare)

Region/District	Wheat	Rice	Cotton	Oil Seeds	Sugar Cane	Pulses	Bajra	Maize
Majha								
Gurdaspur	4362	2831	-	738	68450	560	-	2042
Amritsar	4885	3108	274	932	65870	338	703	2407
Doaba								
Kapurthala	4710	3489	-	1190	55040	500	-	3357
Jalandhar	4925	3487	-	1326	58720	625	-	2949
Nawanshar	4597	3481	-	1216	58060	667	703	2550
Hoshiarpur	3591	2920	-	1030	62010	600	-	2680
Malwa								
Ropar	4022	3112	-	909	54540	592	-	2426
Ludhiana	5064	3611	-	1250	70510	716	-	3122
Ferozepur	4648	3509	335	1103	70630	649	703	-
Faridkot	4662	3388	353	1090	60740	425	-	-
Muktsar	4725	3208	344	898	66360	658	703	2577
Moga	4928	3355	280	1187	-	655	703	-
Bathinda	4614	3453	302	1051	-	617	572	-
Mansa	4582	3202	374	1000	66560	765	719	-
Sangrur	4828	3562	346	1050	69720	695	753	2577
Patiala	4800	3248	-	1120	59840	706	-	3050
Fatehgarh Sahib	5148	3679	-	1388	62380	1060	-	2759
Punjab	4696	3347	337	1065	62650	665	703	2577

Source: *Statistical Abstract, Punjab, 2001*

While the state has attained high yields in some important crops, considerable scope exists for improving crop yields by furthering full use of technology available, within and outside the country. For instance, wheat yield in Punjab is 4,332 kg per hectare whereas it is 8,031 kg per hectare in Ireland (Table 7). Similarly, Punjab produces rice with the yield level at 3,152 kg per hectare whereas Australia has an yield of 10,269 kg per hectare. Sugarcane yield in Punjab is 59.5 tonne per hectare while in Switzerland it is 136.5 tonne per hectare. Again among fruits, for example, while the yield of citrus in Israel is now over 5,407 kg per hectare, it is only around 180 in Punjab. Efforts should be made to improve the yield per unit-area through exploitation of genetic potential via biotechnological tools and intensive research and development. For accelerating the productivity of different crops, advances made by different countries should be utilized to obtain scientific and technological knowhow for adaptation to suit our conditions.

Table 7
Yields of Crops in Punjab, India and in Selected Countries (kg/ha) 1998-99

Crop	Yield in Punjab	Yield in India	Highest Yield in India	Highest Yield in World	
Wheat	4332	2583	--	8767	Ireland
Rice	3152	1928	2443 (Tamil Nadu)	7539	Ukraine
Maize	2286	1755	3328 (A.P)	9401	Chile
Pulses	788	620	830 (U.P)	5368	France
Oilseeds – Groundnut	774	1210	1630 (Tamil Nadu)	6302	Israel
Sun flower	1718	602	--	2794	Switzerland
Sugarcane	59520	72560	110156 (Tamil Nadu)	118706	Peru
Citrus	180	N.A	--	5407	Israel
Fruits					
a) Kinnow	10000	N.A	N.A	65000	Israel
b) Orange	15000	N.A	N.A	43000	Israel
c) Mango	7000	N.A	N.A	17000	Israel*
d) Lemon	5000	N.A	N.A	50000	Israel*
e) Plum	4000	N.A	N.A	10000	Israel*
Vegetables					
a) Potato	17000	17886	22629 (U.P)	49000	Belgium
b) Tomato	24000	15068	N.A	466667	Netherlands
c) Cauliflower	24000	15000	N.A	50000	Armenia
d) Onion	19330	10106	N.A	81504	Korea

Source: Directorate of Horticulture, Government of Punjab
 Directorate of Agriculture, Government of Punjab
 FAO Bulletin of Statistics, 2002 (Vol.2)
 Israel Agriculture, Govt. of Israel, 1986

Note: * - These figures pertain to 1996

Monoculture: The wheat crop has, from the very beginning, dominated the cropping pattern of the state and its importance has steadily increased. The area and productivity of wheat made a substantial jump during the mid-sixties when new dwarf varieties were introduced. In 1960-61, 29 per cent of the gross sown area of the state was under wheat, which increased to 40.5 per cent in 1970-71 and then to 43 per cent in around 2000-01.

In contrast, the area under rice, which had been only 4.8 per cent in 1960-61 and 6.8 per cent in 1970-71, increased to a level of 33 per cent in around 2000-01. This significant development in the crop production pattern of the state occurred after the introduction of dwarf IRRI rice varieties in the early seventies. Within the cereal group, wheat and rice became the most dominant crops and the area under these two crops together increased from 34 per cent in 1960-61 to over 75 per cent around 2000-01. Unfortunately, however, the seeds used for the cultivation of these two crops have remained limited to a select few. For instance, surveys conducted by the Department of Economics and Sociology, Punjab Agricultural University, have found that more than 80 per cent of the area under wheat is currently using a single variety, namely, PBW 343.

Table 8
Average Yield of Rice, Wheat and Cotton Crops in Punjab (kg/ha)

Period	Wheat	Rice	Cotton American (in lint)
1967-68 to 1969-70	2095	1392	374
1971-72 to 1973-74	2279	2113	415
1974-75 to 1976-77	2400	2410	400
1977-78 to 1979-80	2683	2818	368
1981-82 to 1983-84	2985	3055	280
1985-86 to 1987-88	3346	3230	505
1990-91 to 1992-93	3762	3292	S569
1993-94 to 1995-96	3995	3341	481
1996-97 to 1998-99	4134	3337	280
Annual Rate of Growth (%)			
1967-68 to 1981-82	2.47	6.01	-0.89
			NS
1981-82 to 1998-99	2.14	0.59	-0.38
		NS	NS

Source: *Statistical Abstract of Punjab*, various issues

Note: NS implies statistically not significant

The increasing popularity of the wheat-rice crops rotation practised in the state, however, has been moderated by a slow-down in their respective crop yields. The wheat-yield growth rate declined from the pre-1980 level of 2.47 per cent per annum to 2.14 per cent per annum over the following two decades. The decline in the rice-yield growth rate was more dramatic; it sharply declined from the pre-1980 level of 6.01 per cent per annum to a statistical insignificant level of 0.59 per cent per annum. Rice yield in the state is now fluctuating between three to 3.5 tonne per hectare. Another problem of practising monoculture is the resurgence of pests and diseases, which has adversely affected crop production in most of the districts. The wheat-rice crop rotation has also caused emergence of new and uncontrollable weeds. Monoculture all over the world is considered harmful to natural reserves, and is a risky proposition, which should not be practised over a longer period.

SOIL AND WATER MANAGEMENT

Soil management: Most of the soils of Punjab are alluvial and deep, varying from sandy to silty clay. Due to intensive cultivation, the organic carbon of the soil has come down from 0.5 per cent in 1960 to 0.2 per cent in 1990. Loss in organic carbon means wasteful extra application of chemical fertilizers, loss in soil biological activity and poor soil moisture retention. The high nutritional requirement of paddy and wheat have

exhausted the soils of vital nutrients. Thus, higher and higher doses of major nutrients, especially nitrogen, has to be applied for sustaining adequate production levels. Micro-nutrient deficiencies in large areas have also been noticed adversely affecting crop yield. The following are some of the important soil related problems that are adversely affecting agricultural production in Punjab:

- *Physical*: Surface crusts; sub-soil compaction; soil erosion; poor air-water relationship; development of hard pan; development of fine textured sodic soils.
- *Hydrologic*: Shallow water table; negative water balance; water logging; flood hazards; free percolation in coarse soils and poor permeability in fine textured soils.
- *Chemical*: Depletion of organic matter; multi-nutrient deficiencies; nutrient imbalance; salinity/sodicity and pollution from agro-chemicals, sewerage and industrial effluent.
- *Biological*: Decline in quality and quantity of soil biomass; low-biological oxidation and slow rate of decomposition of crop residues.

Punjab has about 4.2 million hectare of land area under cultivation. In addition, another two million hectare of degraded land is available (Table 9). Part of this degraded land can be recovered for cultivation provided adequate research is undertaken for its reclamation. On the other hand, it is more important to preserve existing cultivated areas from degradation due to water logging, soil salinity and sodicity, besides soil erosion due to intensive cropping and its attended manifestations. Repeated paddy cultivation in the long run will make the soils fine textured, impervious and unfit for cultivation. Corrective measures through intensive R & D have to be undertaken to conserve soil resources. Speedy soil-testing facilities, followed by appropriate advice about fertilizers use, can effectively help save the soils from exhaustion.

Table 9
Extent of Degraded Land in Punjab

Waste-land/soil degradation	Area (lakh ha)
Water erosion	
(i) Severe (gullies, ravenous)	1.70
(ii) Slight & moderate (with/without scrubs)	3.40
Water-logged—rising water table	1.22
Marshy-submerged	2.28
Salt-affected (varying degrees of deterioration)	
(i) Canal command areas	3.93
(ii) Outside canal command areas	1.27
Degraded forest/pasture lands	2.00
Coarse/very light textured (loss of nutrients with deep percolation and leaching, poor in fertility)	6.20

Source: Director, Punjab Remote Sensing Centre, Ludhiana

Water management: Punjab has an irrigation distribution network of 1,45,000 kilometres of canals including branch canals and minor distributaries, and one lakh kilometres of field channels or water courses. The canal irrigation system irrigated 12,92,000 hectare land in 1970-71 while only 10,02,000 hectare was irrigated in 2000-01 (Table 10). There has been a significant reduction in canal irrigated area since 1990-91. At present only around 40 per cent of the water that enters the canal system irrigates the crops, whereas the optimum efficiency should be above 60 per cent. Management of the canal irrigation system needs revamping, so that the water thus saved can be used for the remaining unirrigated areas of the state.

Table 10
Net Irrigated Area ('000 ha.) by Different Sources in Punjab

Source	1970-71	1980-81	1990-91	1999-2000	2000-2001
Canals	1292	1430	1669	1051	1002
Tube wells	1591	1939	2233	2938	3017
Other sources	5	13	7	12	2
Total	2888	3382	3909	4001	4021
Share of area irrigated to the gross area sown (%)	71	81	93	94	94

Source: Statistical Abstract, Punjab 1971, 1981, 1991, 2000 and 2001

Note: * - Indicates provisional estimates

There are 9,35,000 tube wells to lift underground water for irrigation. The total demand for irrigation water in the state is estimated at 4.381 million hectare metres (mhm) against a total supply of 3.130 mhm from both canal and ground-water resources, leaving a net deficit of 1.251 mhm (Sondhi and Khepar, 1995). The deficit is met from over-exploitation of groundwater reserves through tube wells. In many areas, excessive exploitation has pushed the groundwater table below the critical depth of 10 metres.

Irrigation coverage, which was around 71 per cent of the total cropped area in 1970-71, increased to 94 per cent in 2000-01. While canal irrigation has been declining over the years, tube well irrigation, particularly in the central and northern region of Punjab has been on the increase. Over six per cent of the total tube wells in India are in Punjab. Deep tube wells are being used even in the southern region, where the underground water is brackish.

Due to cheap credit and free supply of electricity, the use of tube wells for irrigation has increased steeply in the state. The number of electrically operated tube wells has increased from 6.0 lakh in 1990-91 to 7.7 lakh in 1999-2000. Extensive use of canal irrigation and reckless use of groundwater through tube wells have caused water logging problems in some areas and lowering of the ground-water table in other areas. The water table in the central districts of Punjab has been going down at an average rate of 0.23 metres per year (Table 11). It is estimated that in the next 15 years about two lakh submersible pumps would be needed to replace the present pump sets, at an estimated cost of Rs. 2,000 crore, or an additional expenditure of Rs. 5,000 per hectare, in addition to a two-fold increase in energy consumption.

Table 11
Rise and Fall in Underground Water Table in Different Districts of Punjab, 1973 through 1994

District	Fall in water table (m)			Rise in water table (m)		
	Blocks	1973-83	1984-94	Saline/ semi-saline blocks	1973-83	1984-94
Sub-mountainous Zone						
Gurdaspur	All	+0.2-0.6	-0.7-1.2	--	--	--
Ropar	All	+0.04	-1.8	--	--	--
Hoshiarpur	All	-0.9	-0.9	--	--	--
Central Plains						
Amritsar	All	-0.9	-2.3	--	--	--
Kapurthala	All	-0.7	-1.8	--	--	--
Jalandhar	All	-1.5	-2.5	--	--	--
Ludhiana	All	-0.9	-1.9	--	--	--
Patiala	All	-1.7	-9.8	--	--	--
Fatehgarh Sahib	All	-1.3	-2.7	--	--	--
Sangrur	All	-5.1	-5.1	--	--	--
Southwest Zone						
Mansa	All	-1.6	-1.4	--	--	--
Bathinda	0.5	+3.5	-1.9	0.5	7.3	4.2
Faridkot	0.5	-1.15	-4.5	0.33	9.0	5.0
Ferozepur	0.75	+0.1	-4.5	0.25	7.7	3.0

Source: Directorate of Water Resources, Punjab.

Currently, 90 blocks out of a total of 118 show a decline in water-table depth ranging from zero to three metres (24% area), three to five metres (23% area) and above five metres (29% area). According to a PAU estimate, there is over-exploitation of more than 100 per cent of annual net recharge of water in 63 blocks, whereas in seven blocks it is above 85 per cent. Out of the remaining 38 blocks, 15 fall in the grey category with 65-85 per cent of net annual recharge to groundwater, thus leaving only 23 blocks in the white category (Table 12). This over-exploitation of underground water is due to increase in the number of tube wells, free supply of electricity, cultivation of such high water-consuming crops paddy, potato, wheat, sugarcane, etc., and scant attention to efficiency in water use. Extensive research is needed to work out methods for optimum water-use efficiency for different crops in different regions. Time has come to use increasingly rain-water harvesting technologies for conserving water and for recharging the underground water, both in rural and urban areas.

Table 12
Distribution of Blocks into Dark, Grey and White on Basis of Underground Water Resources in Punjab, 1994

District	Dark	Grey	White	
			Total	Technically exploitable
Gurdaspur	5	3	5	1
Hoshiarpur	1	4	6	0
Ropar	1	1	4	0
Sub-mountainous Zone	7	8	15	1
Amritsar	12	3	0	0
Kapurthala	4	0	0	0
Jalandhar	12	0	0	0
Ludhiana	9	1		0
Patiala	8	1	0	0
Sangrur	10	0	0	0
Central Plains	55	5	0	0
Mansa	0	0	3	1
Bathinda	1	0	5	2
Faridkot	4	0	6	0
Ferozepur	3	2	4	2
Southwest Zone	8	2	18	5

Source: Directorate of Water Resources, Punjab, Chandigarh.

Watershed management: Soil erosion is rampant in the sub-mountain kandi region of the Shivalik range, due to excessive water-flow during the rainy season and absence of water for irrigation in the rest of the year. Water management is necessary in this area. A watershed development project was initiated in 1990 with the assistance of the World Bank in this region. Vegetative barriers and vegetative reinforcements have been established in 6,274 hectares, as a result of the development of watershed contours and rain-water conservation has been made possible for irrigating over 5,000 hectare of land. Watershed management has helped improve crop yield. Cropping intensity too has increased to 165. In the project area successful cultivation of crops, forests and grasses has become possible, while in non-project areas conditions continue to be favourable for growing crops. Participation of the local people and government agencies have demonstrated that infertile and degraded areas can be conveniently converted into fertile and cultivable areas with collective effort and effective use of technology. Extension of watershed management programmes in the remaining areas is necessary for increasing crop productivity. Besides, watersheds can meet the growing demand for irrigation in lean periods.

MECHANIZATION AND CHEMICALIZATION OF AGRICULTURE

Mechanization: Intensive agriculture requires farm mechanization, besides modern inputs of seeds, water and such chemicals as fertilizers and pesticides. The rapid adoption of the green revolution technology in Punjab has led to a sharp increase in farm mechanization. In 1960-61, there were seven tractors per thousand hectare of land, which shot up to 96 in 1998-99. On an average, there is now one tractor for every eight hectare of net cultivated land, and in some districts the area operated by a tractor is even lower. In contrast, at the all-India level, the area operated by a tractor is above 66 hectare. Table 13 provides a comparative picture of the stock of agricultural machinery and implements in Punjab and the country as a whole. Clearly, Punjab agriculture is relatively more heavily mechanized.

Table 13
Agricultural Machinery and Implements in Punjab and India (in '000)

Implements and Machinery	Punjab 1996	India 1992
Tractor/Trailer	330	12218
Tiller/cultivators	228	
Disc harrows (T. drawn)	248	
Seed-cum-fertilizer drills	135	
Spray pumps	510	
Tractor-drawn combines	4.6	
Self-propelled combines	2.3	
Threshers	305	
Cane crushers (bullock operated)	--	5861
Cane crushers (power operated)	35	
Tubewells	875	109809
Wooden ploughs	--	395815
Iron ploughs	--	
Carts	--	133860

Source: *Statistical Abstract, Punjab, 1997, Chandigarh*
Statistical Abstract, India, 2000

There are numerous farmers in Punjab with little land, owning a tractor, while many large farmers have more than one tractor. The available stock of tractors in the state is not fully utilized. In addition, lack of facilities for the service and maintenance of farm equipment near the villages results in raising the cost of production.

Excessive farm tractorization has caused damage to physico-chemical characteristics of soils, particularly where puddling is done for rice cultivation. With the loss of soil characteristics, biological activities are also impaired and in the long run, such soils are likely to become unproductive. Use of harvester-combines for wheat and paddy has been on the increase. Their use leaves uncut straw and stubbles in the fields, which are often burnt, causing smoke pollution. Approximately 10,000 tonne of straw are thus lost every year, which could otherwise have been used as feed for cattle or ploughed back into the soil to improve some of its characteristics.

The high level of mechanization used in sowing, irrigation and harvesting has considerably displaced human and bullock labour from Punjab agriculture. Upto 1977, bullock-operated ploughs, wells, carts and cane-crushers dominated the agricultural scene. By 1996 these implements had virtually disappeared. Farm mechanization, no doubt, has been beneficial for the intensive use of land and has helped considerably in

overcoming the risk of unfavourable effects of weather on maturing crops. In turn, there has been a decline in the use of agricultural labour, which has created serious social and economic problems, as alternative avenues for employment of displaced labour are few. The level of efficiency of farm implements, in terms of time and energy-consumption, needs to be improved through extensive research. Besides, there is also need to develop more innovative and inexpensive instruments, which could be used as time-saving devices and also for additional operations of cleaning, grading, packing, etc.

Chemicalization: Extensive use of agro-chemicals became an important component for increase in crop production during the initial years of the green revolution, and their use has since continued to increase. Among the agro-chemicals, chemical fertilizers dominate the scene, followed by pesticides including weedicides. Punjab has the highest consumption of chemical fertilizer per hectare in the country. It consumed 167 kg of chemical fertilizers per hectare during 1997-98 as compared to the all-India average of 74 kg. Growth of chemical fertilizers consumption was the highest during 1970-71 to 1980-81, with the consumption of all types of chemical fertilizers (NPK) increasing by 250 per cent. By 1998-99 it declined to 80 per cent (Table 14). While productivity of crops increased during the first two decades, on account of increasing nutrient-use efficiency, it began to decline thereafter on account of imbalances in the use of N, P and K, along with the deficiencies of micro-nutrients. The fertility level of 67 per cent blocks in the state was reported to be low in N, while in the remaining 33 percent, it was medium (Table 15). Further, micro-nutrient deficiency of zinc, iron and magnesium has become pronounced in several areas of the state. Deficiency of sulphur and copper too has been reported from several areas. To enhance fertilizer-use efficiency under different cropping systems, continuous technological inputs are needed to make them cost-effective. Integrated use of balanced chemical fertilizers in conjunction with organic manures (compost and green manure), rotation of cereals with legumes and use of bio-fertilizers and vermiculture have to be undertaken to maintain the health of the soil.

Table 14
Consumption of Chemical Fertilizers in Punjab ('000 metric tonne)

Year	Nitrogenous (N)	Phosphates (P ₂ O ₅)	Potassic (K ₂ O)	Total NPK
1970-71	175	31	7	213
1980-81	526	207	29	762
1990-91	877	328	15	1220
1998-99	1081	275	19	1375

Source: *Statistical Abstract of Punjab*, 1999

Table 15
**Per cent Distribution of Blocks According to Fertility Status
of Soils in Punjab (on the basis of per cent deficient samples)**

Fertility Status	1970-77			1981-90		
	N	P	K	N	P	K
Low	52	16	13	67	44	--
Medium	48	65	58	33	55	43
High	--	19	29	--	1	57

Source: Brar and Chhibba, 1994, Brar, 1979

Use of pesticides including weedicides has also contributed to increasing crop production. Currently, about one kg technical grade pesticides per hectare is being used in wheat, paddy, cotton, sugarcane, fruits and vegetables cultivation in Punjab against the all-India average of 350 gm per hectare. The spectrum of use of pesticides has been

changing over the years in response to emerging pests- and weed-problems due to intensive cultivation.

Excessive and indiscriminate use of pesticides and weedicides has led to several new problems, such as development of pest resistance, pest resurgence and outbreaks, and adverse effects on such non-target organisms as predators, pollinators and honey bees. Development of resistance in the American boll worm, because of abuse and misuse of pesticides, accounts for the inability to control cotton pests in Bathinda district. (See the CRRID report on Problems of Cotton Growers in Punjab). Even contingency strategies have failed to cope with the situation causing enormous losses to cotton growers during the last five years. Similarly, abuse and misuse of pesticides is rampant on fruit and vegetable crops, which pose great health hazards to consumers.

The strategy for effective management of pests- and weed-problem lies in the use of integrated pest management technology (IPM), wherein agronomic practices, inter-cropping and forecasting of pests and diseases are essential components, besides use of pesticides. Unfortunately, IPM technology for important crops has not reached the farmers, due to lack of effective extension efforts. On the other hand, the pesticides available in the market, particularly at the village level, are usually unbranded, often adulterated or date-expired, and the advice on how to use pesticides is given by relatively ignorant pesticide sellers or commission agents. This inadequacy in the use of pesticides is not only wasteful but also dangerous, as it contributes heavily to the pollution of air, water and soil, in addition to health hazards. Appropriate information has to be made available to the stakeholders so that the ill effects of agro-chemicals are reduced. Suitable technologies should be developed to promote safe and efficient use of pesticides. Use of bio-pesticides should be encouraged so that health hazards are minimized.

The disquieting aspect of the excessive use of chemical fertilizers and pesticides is their adverse affects on the eco-system, as it causes soil pollution as well as underground-water pollution, plus changes in ecology of weed and soil organisms. Overuse of pesticides is becoming a threat to both human and cattle populations, besides disturbing the flora and fauna of the state. It is on account of these ill effects of agro-chemicals that the green lobby for growing and using organic foods is picking up in the West. Punjab, being agro-technically progressive, should venture into developing technologies for growing organic crops for domestic and international markets.

AGRICULTURAL CREDIT

Sources of institutional and non-institutional credit: Credit is an important enabling input, which has significantly contributed to the success of the green revolution in Punjab. The credit delivery mechanism, cost of credit, etc., are intimately linked with the sources of supply of credit to agriculturists. Formal credit institutions, such as co-operative societies, co-operative banks, land mortgage banks, regional rural banks and commercial banks are supposed to meet the credit requirements of most agriculturists in Punjab. The extent and spread of formal credit institutions in Punjab is given in Table 16. Compared to other states, the spread of the co-operative credit network, as also of commercial and regional rural banks, is fairly well developed in Punjab. There are 50 bank branches per thousand square km in Punjab as compared to 20 for the whole country, 21 for Maharashtra, 18 for Andhra Pradesh and 19 for Gujarat.

Table 16
Extent of the Spread of Formal Credit Institutions in Punjab
(1998-99) (in Lakh Rs.)

S. No	Type of institution	Number	Loans advanced in 1998-99	Loans outstanding as on 31 March 99
A. Co-operatives				
1.	Primary Agricultural Credit Societies	4200	1716.13	1327.17
2.	Primary Non-credit Societies	882	200.99	133.28
3.	Primary Agricultural Development Banks	80	487.00	1240.00
4.	Punjab State Agricultural Development Banks	1	311.35	1183.96
5.	Punjab State Co-operative Bank	1	5958.60	1324.11
6.	Central Co-operative Bank	19	3334.42	1951.55
B. Banking Institutions				
1.	Number of branches including those of RRB's	2520	2007.50	2255.29

Source: *Statistical Abstract*, Punjab, 1999

Besides institutional credit, a substantial amount of credit flows to the farmers from non-formal channels, i.e., commission agents or arhtias. The Department of Co-operation, Government of Punjab, in one of their studies (1998), has pointed out that 63.85 per cent of farmers obtained credit from arhtias or commission agents, 51.25 per cent from co-operative institutions and 8.85 per cent from commercial and regional rural banks. About 55 per cent farmers borrowed money from more than one source, with the idea of revolving back the money for credit repayment. The study further reveals that small, medium and large farmers were more dependent on commission agents (arhtias) for short-term loans. The amount of credit per operated acre of land was the highest among small farmers (Rs. 4,536) and the lowest among large farmers (Rs. 2,488).

Small and medium farmers in the state have taken more long-term loans, during 1998-99, and that too for non-productive purposes in most cases. Non-productive long-term loans were mostly taken from private money-lenders. Commercial banks were the preferred agencies for long-term productive loans. According to the same study, Punjab farmers are under debt of Rs. 5,700 crore, out of which 46.32 per cent is to commission agents, 7.12 per cent on mortgages, 27.14 per cent to co-operative institutions and 19.42 per cent to commercial banks. However, the amount of debt per unit of operated area was higher among marginal, small and medium farmers than among large farmers. Increase in indebtedness, though officially attributed to the increasing cost of inputs, is high really because of unproductive spending habits of farmers; the relative ease with which credit is made available encourages farmers to spend it often on social ceremonies and excessively on domestic consumption.

The arhtia-farmer relationship is traditionally very old and bitter, because of the excessive interest they charge. On the other hand, no institutional credit can match the services the arhtias provide --speedy supply of credit on demand and on short notice. Sometime the artias manipulate the repayment, by giving more loans at a still higher interest rate, until the farmer is forced to sell a part or whole of his land, to meet the debt obligations.

Incidentally, formal credit, though most welcome for increasing agricultural production, has some inbuilt shortcomings. Hassles in obtaining credit from formal institutions is consumer unfriendly as it is time consuming; demands documentation based on land records, which does not include leased or mortgaged lands; and there are credit limits for specific operations and crops. Inefficiencies of the credit institutions, delays and uncertainties due to lack of manpower, unco-operative attitude of the officials, commission for processing loan applications through agents, and political and administrative interference are the reasons for the arhtias being more popular with the farmers. The flourishing business of the arhtias often depends on the credit they themselves obtain from the banks against land for advancing the money to the bank shy farmers. (Those who do not want to disclose their identity). All efforts in the past to overcome the shortcomings of the credit institutions and reduce the influence of arhtias and commission agents have failed to yield the desired results. Nevertheless, with the increasing opening up of the rural economy, a system of direct linkages should be encouraged through face to face contact of the producers with the investors or marketing and processing agencies. The role of the corporate sector in such a venture needs full policy and governmental support in order to minimize the role of commission agents and arhtias.

Kisan credit cards: Keeping in view the limitations and inefficiencies of the formal credit system, and heavy dependence of farmers on arhtias, the Central Government introduced a scheme of Kisan Credit Cards (KCC) in 1998-99. It aims at adequate and timely support from the banking system to farmers for their agricultural needs, particularly for crop production and short-term loans. The KCC has a provision of flexibility in withdrawing money at any time according to the farmer's requirements, while the borrowing limit is fixed according to the net worth of the farmer, which is determined by district-level technical committees. The KCC scheme is like revolving cash credit and provides for any number of withdrawals and repayments within the limit. The number of KCCs in Punjab stood at 62,624 as in September 2000, with a sanctioned amount of Rs. 317.15 crore.

There was initial enthusiasm for over a year in obtaining the Kisan Credit Cards, but this has slowed down for various reasons. A farmer has to be literate and has to declare the total value of his assets before getting a credit card. He has several inhibitions about such disclosures. Only large farmers are taking advantage of KCC. The success of KCC would depend upon its wide acceptability and use by the small and medium farmers. This might be possible if the credit limit is linked only with the farmers' property value and repayment is made easier and at a lower interest rate.

AGRICULTURAL RESEARCH AND EXTENSION

Punjab Agricultural University (PAU), Ludhiana, was established in 1962 on the pattern of Land Grant Institutions of the USA. The university did a commendable job in adapting Mexican wheat varieties suitable to North Indian conditions and subsequently improving their quality. Similarly, rice varieties developed by the International Rice Research Institute (IRRI), the Philippines, were quickly modified to suit Indian conditions, thereby getting a quantum jump in yield over the previous existing varieties. Along with this, research in other areas, such as plant protection, agronomy, soil sciences, agricultural economics, etc., helped develop a full package practices. All combined to usher in the green revolution during the late 1960s, which became a role model for the entire country.

The State Department of Agriculture also contributed its mite by disseminating the findings of the university and arranging to produce the required seeds of high yielding varieties. Extension agencies of both the Agricultural University and the State Department of Agriculture reached the farming community with their packages, who, in turn quickly responded by adopting these for the production of wheat and paddy, which gave them good returns. Since then, PAU has been actively engaged in extending its teaching, research and extension activities, and bagged the award of the best Agricultural Research Institute from the Indian Council of Agricultural Research (ICAR) in 1995. The research activities of the State Department of Agriculture were transferred to PAU in 1962, while the extension work continued to remain with it*.

PAU has developed an excellent infrastructure for agricultural research in its five faculties: Agriculture, Agriculture Engineering, Basic Sciences and Humanities, Home Sciences and Veterinary Sciences. The ICAR has established five Centres of Advanced Studies and Training in the PAU, namely, Farm Power and Machinery; Genetics and Plant Breeding; Soil Sciences; Veterinary Gynaecology and Reproduction; and Veterinary Surgery and Radiology. More than 5,000 committed research workers, academics and field extension workers are on the rolls of the university.

Despite all attributes, which make PAU a great Institution, its present activities are not very promising. The biggest problem is of inbreeding, with more than 85 per cent of the staff stagnating in their knowledge and its dissemination. More than 75 per cent of the faculty received their Ph.D. degrees from PAU and this proportion will reach 90 per cent by the end of 2006. Nearly 34 per cent of the present faculty will retire by 2006, whereas the number of direct recruits with degrees from other universities is relatively very small. There is very little participation of the faculty in international exchange programmes,

* The State Department of Agriculture has 12 district-level farmers' training centres (STCs) to impart training to the farmers and farm-women. These training centres were established in the early sixties. The existing 12 STCs also cater to the training needs of the newly carved five districts of the state. These are also instrumental in imparting training to the farmers and farm-women in day-to-day agricultural technological developments with regard to crop production and other allied occupations. For this purpose training camps of farmers at the district level were organized, where scientists of PAU educated on the progressive farmers and field staff of the department of agriculture about the latest scientific techniques for crop production and marketing. These were organized both in Kharif and Rabi seasons at all the district headquarters. Later, the staff of the department of agriculture have been organizing farmers' training camps at block and village levels. Every year about three lakhs farmers are trained on scientific crop production.

The details of the training programmes undertaken both during Kharif and Rabi every year by these training centres are given below:-

Sr. No.	Name of Training Camp/Institutional	No. of Camps/Courses
1.	District level training camp	34
2.	Block level training camps	272
3.	Specialized institutional courses for farmers and farm-women	340
4.	Institutional courses for conveners	255
5.	Production-cum-demonstration camps	1700
6.	Demonstration camps for farm-women	170

training programmes or even international conferences and symposia. Lack of funds is said to be the reason for the neglect of this important training and skill upgradation activity. PAU is also saddled with problems of imbalance in staffing and declining quality of education. Staff deployment is unrelated to the importance and prioritization of programmes. PAU is ridden with inadequacies not only of research strategy and extension but also of basic maintenance, because of an unhealthy fiscal situation. Around 85 to 90 per cent of the total budget of PAU is spent on salaries alone.

Research and information hold the key to bringing about major breakthroughs in agricultural and livestock production. At present PAU's means of assessing, storing and retrieving information are very primitive. While Punjab agriculture needs a turn-around in its effort to meet global challenges, PAU is lagging behind and is unable to provide any leadership, for which it was once known as the premier institution at the time of the green revolution.

Extension activity, involving transfer of technology, had once been the most important work of the university. It used to provide a live and intimate link between scientists on the one hand and the field-level functionaries of different state departments, other development agencies and farmers on the other. The three services provided by the extension directorate have been: farm advisory service; farm communication service; and farm training programmes. Besides T & V programmes, these have been very successful and have attracted large numbers of farmers to the Campus Kisan Melas, held at the university and at district headquarters and Regional Research Stations. Currently, the extension activities of the university have considerably slackened and farmers are losing faith in these, as answers to their problems are not forthcoming.

PAU is equipped to meet effectively the challenges of agricultural research posed today by liberalization, privatization and globalization trends, as it has the necessary infrastructure and skills. However, there is need for focused prioritization in research and development strategies, as was the case at the time of the green revolution. Emerging challenges demand that the university should take a fresh look at all its resources, policies and programmes, in order to make a shift to a progressive, sustainable and long-lasting framework of activities. This requires not only adequate funding but also basic improvement in the quality of manpower. It will be necessary to develop a strategic partnership with the corporate sector and with other research institutions both in India and abroad, so as to make a shift from adaptive to original research. For this, excellence in teaching programmes through modern courses and well-equipped laboratories are a must. The disjointed projects for research have to make way for a systems approach to agricultural research. The green revolution made a quantum jump in the yield of wheat and paddy, but such increases in the yield of other crops were neither aimed at nor any breakthrough achieved. A complete range of packages, including technologies for efficient land- and water-management, agronomic practices like IPM, INMS, development of bio-fertilizers and bio-pesticides, etc., and post-harvest storage and marketing techniques and systems have to be developed. Such research, which cuts across different disciplines, requires a significant shift from the existing commodity-approach to an integrated and precision-programme mode, which may entail a matrix management system.

A sustainable demand-driven and cost-effective production system with integrated natural resources management has to be introduced keeping particularly in view the marginal and small farming system, which has become dominant in the state. Such an

approach should aim to increase productivity, decrease cost of inputs, increase efficiency of management systems, leading thereby to increase in profits from agriculture. The future of agriculture lies in a commercial approach based on the theory of inputs and outputs, demand and supply, and marketing and storage.

During this process of change, such environmental manifestations as health of soil, water, air, forests and agricultural labourers, have to be kept in view. Introduction of transgenic crops, either developed indigenously or brought from abroad, have to be introduced in the local environment, keeping in view the ethics, future requirements and developments, and probable effects on the biosphere. Biotechnology is an expensive and useful tool, which can be used profitably by agricultural and veterinary scientists, provided proper expertise, instrumentation and experimentation are at hand for its exploitation. We have to go a long way to achieve the high productivity levels in different crops attained by many countries (See Table 7). Keeping this in focus, PAU should gear its research programmes in a manner that agricultural production is revolutionized in Punjab as earlier, at the time of the green revolution. The state government has already provided the seed money of Rs. 100 crore to the university for improving its research and other facilities. It remains to be seen whether PAU can rise to the occasion to lead the agriculture of the state to unprecedented levels of success once again.

THRUST FOR NEW DEVELOPMENT INITIATIVES

Public and private investment: Public sector investment in Punjab is around 10 per cent of the Net State Domestic Product (NSDP) in agriculture. Gross capital formation in agriculture in 1998-99 was Rs. 2,157 crore at current prices, while at constant prices it was Rs. 1,633 crore (Table 17). Plan outlays for infrastructure and agriculture and rural development in Punjab have always been the highest among all the major states in all the plans. In the Eighth Plan, Punjab had invested a total of Rs. 618 crore for infrastructure development in agriculture at 1980-81 prices (Table 18). Unfortunately, the state has not been able to attract foreign direct investment in agriculture, or for other ventures, and ranks 14th among the states of India.

Table 17
Trend in Public Sector Investments in Punjab Agriculture (Rs. crore)

Year	Public sector investment		NSDP Agriculture at current prices	Public sector investment as % NSDP agriculture
	At current prices	At 1993-94 prices		
1993-94	1166.02	1166.02	12978	8.98
1994-95	1476.82	1354.17	14264	10.35
1995-96	1446.45	1227.56	15369	9.41
1996-97	1520.04	1215.45	18013	8.44
1997-98	1902.63	1453.85	18900	10.07
1998-99	2156.99	1633.14	20559	10.49

Source: Ramesh Chand 2000, *Policy Paper 11*, NCAP, New Delhi

According to the Reserve Bank of India (RBI) and the National Sample Survey Organization (NSSO) surveys, per hectare provisions of fixed capital formation were the highest in Punjab during 1980-81, but fell to the fourth position in 1991-92. Most of the private investment has gone into farm machinery and irrigation structures. As a result, the state has a high degree of mechanization of farm operations. Since capital intensity is increasing among all categories of farmers, particularly large farmers, it is making agriculture less profitable, as net returns are getting reduced due to the higher cost of cultivation.

Table 18**Public and Private Investments in Agriculture during different Plans (Unit Rs/ha at 1980-81 prices)**

Plan	Public Investment		Private Investment	
	Punjab	India	Punjab	India
Fifth Plan (1974-75 to 1978-79)	853	311		
Sixth Plan (1980-81 to 1984-85)	713	258	262 (1981-82)	80 (1981-82)
Seventh Plan (1985-86 to 1989-90)	355	197		
Annual Plan (1990-91 to 1991-92)	128	187	173 (1991-92)	126 (1991-92)
Eighth Plan (1992-93 to 1997-98)	618	188		

Source: Ramesh Chand 2000, *Policy Paper 11*, NCAP, New Delhi.

The decline in public investment is mainly due to diversion of resources to subsidies for fertilizers, rural electricity, irrigation, credit and other agricultural inputs, rather than for creation of assets. The declining trend in public sector agricultural investments has to be reversed by increasing allocation of public funds for agriculture. As the state is facing a severe resource crunch, public investment can be increased only if the present flow of subsidies on such inputs as power, water and fertilizer are reduced.

Employment generation: In the post-green revolution situation in Punjab agriculture, farm mechanization and paddy-wheat crop rotation has greatly influenced the labour employment pattern. Abundant labour are employed during the sowing and harvesting seasons. They are relieved after the operations are over. This has reduced the duration of employment of casual labour and peasants on the farms. The capitalist pattern of agricultural development has not only increased casualization of the workforce but also the share of hired labour, which is mostly migrant and comes during the season from Uttar Pradesh, Bihar, Rajasthan and other states. The affluence of farmers, achieved during the green revolution, has also affected their life-style and mindset. They now spend more on consumable items, social functions and, aspire to own scooters and cars. The youth from the farming community at best drives a tractor but shuns hard work on the farm, which is normally passed on to the hired labourer. This pattern has created a paradox of scarcity and surplus of the labourforce in the state.

Trends of employment*: The Planning Commission has estimated that Punjab will have a very low growth rate of employment, that is, 0.73 per cent per annum during the Ninth Plan period. The labourforce is projected to grow at the rate of 2.27 per cent per annum. Consequently, 10,65,000 persons will be unemployed during the Ninth Plan. The data collected by the Economic and Statistical Organization of Punjab indicate that the unemployment situation in the state is more serious than projected by the Planning Commission. Labour absorption capacity of agriculture is on the decline in Punjab. The annual rate of decline is the highest for paddy (2.36%) followed by wheat (2.22%), maize (1.61%) and sugarcane (0.98%). Only in the case of cotton has there been an increase of 0.19 per cent per annum, but the overall requirement of labour has increased at the rate of over one per cent per annum. The trend of overall increase in labour absorption in the seventies was reversed in the eighties and nineties. Total labour absorption in

*This and the next sub-section are drawn heavily from S.S. Gill, 'Agriculture, Crop Technology and Employment Generation in Punjab', published in *Future of Agriculture in Punjab*, edited by S.S. Johl and S.K. Ray, published by the Centre for Research in Rural and Industrial Development, January 2002.

agriculture stood at 480 million man-days during the triennium ending 1983-84. It declined to about 432 million man-days during the triennium ending 1996-97 (Table 19).

Table 19
Estimated Total Employment in Principal Crops ('000 Man-Days) in Punjab

Year (Triennium ending)	Paddy	Wheat	Cotton	Rapeseed & Mustard	Others	All Crops
1983-84	141519.47	149786.39	61184.16	3943.11	123946.73	480379.86
1992-93	144871.20	143271.44	69735.66	3527.01	84152.21	445557.52
1996-97	139836.04	139281.45	65351.34	3557.21	83644.51	431670.55

Source: S.S. Gill, 'Agriculture, Crop Technology and Employment Generation in Punjab', published in *Future of Agriculture in Punjab*, edited by S.S. Johl and S.K. Ray, published by the Centre for Research in Rural and Industrial Development, January 2002.

- Note** : 1. Employment is calculated by multiplying, area under different crops by per hectare employment in respective crops (i.e., paddy, wheat, cotton, rapeseed and mustard). In the case of other crops the weighted average (of four crops) per hectare employment is multiplied by the total area under other crops.
2. Total employment In 1992-93 over 1983-84 declined by 7.25 per cent and in 1996-97 by 10.14 per cent over 1983-84.

The major cause of this decline is the sharp decrease in man-days required per hectare in crop cultivation. The high level of mechanization in sowing, irrigation and harvesting of paddy and wheat has progressively replaced human labour by machine labour. Draught power has virtually disappeared from the agricultural scene in Punjab.

Employment pattern: The problem of under-employment is quite serious for domestic labourers, as half the time there is usually no work available for them. At the same time, unemployment is on the rise, both among educated and uneducated youth in rural areas, mostly in the age-group between 15-20 years. The employment-generation strategy and policy has to be multi-pronged, bearing in mind the capabilities and aspirations of the unemployed youth and the availability of resources in the state. The long-term strategy demands that in the next 10-15 years, nearly half the cultivators and about 20 per cent of the agricultural labourers have to be shifted outside agriculture both within and outside rural areas. Non-farm employment has to be expanded in major areas, so that the potential workforce presently engaged in agriculture and allied activities are shifted to these sectors. Decentralized development, or block planning, has to be accompanied by major investments by the public or private sector for marketing, storage, processing and transportation. This can also take care of the uneducated and unemployed youth.

There is generally a mismatch between the aspirations of the unemployed and the policies pursued for creating employment opportunities. Rural educated job-seekers aspire to secure white-collar government or semi-government jobs. On the other hand, the government is not willing to act as a major employer of such youth. Alternative opportunities for skill-development through vocational training has to be popularized at the village level. Simultaneously, the corporate sector has to be encouraged to enter the rural areas with their programmes, so that employment generation activities are created. Self-employment skills have to be imparted and credit facilities made available for translating their aspirations into reality in rural areas. The machinery of the Planning Commission needs to be activated with well thought-out policies and action programme, as the task is colossal and calls for multi-directional co-operative efforts.

Contract/commercial/organic farming: In order to give a boost to the supply of commodities for the processing industry there is a need for their production in contiguous areas around processing units. For this, usually commercial or contract farming is undertaken. In the case of sugar production, commercial farming is already in vogue as many farmers produce sugarcane in defined command areas of the factory and supply the cane to it. However, in a situation where the factory operates below its capacity, commercial cane growers suffer loss due to non-utilization of their produce. Farmers suffered similar losses when Pepsi Corporation switched over from contract farming to commercial farming in the case of tomato.

Contract farming has the advantage of the buyer entering into a contract with the required number of farmers and taking their entire produce at a previously fixed price, irrespective of the market fluctuations at the time of the harvest. Contract and commercial farming are being practised in Punjab on a limited scale, as the corporate sector with processing units have not entered the scene in any significant manner. Both the systems of farming are of advantage to growers.

The biggest impediment to the expansion of contract/commercial farming is the small land-holdings of the majority of the farmers. In either case a large number of farmers have to be inducted into the system in a contiguous manner. The reluctance of a few farmers in between, jeopardizes the efforts of contract or commercial farming. The land-lease and tenancy system have to be re-oriented and modified to help farmers to extend ready support to contract/commercial farming.

Organic farming, particularly in the case of fruits, vegetables, cotton and sugarcane, is the buzz word in the West, where the green movement is transforming food habits of people. Organic farming helps in the improvement of the physical health of the soil by increasing moisture-holding capacity, regulating soil temperature and by improving the texture and structure of the soil. Organically grown commodities fetch a two to four times higher price. For growing organic foods, the certifying agencies have to be in place to monitor the authenticity of organic cultivation. Proper monitoring during cultivation is an important integral component of organic farming. Farmers with small holdings, who cannot afford to use such capital inputs as fertilizers and pesticides, if imparted proper skills and advice to grow organic foods without any chemical input, would be happy to grow such crops, provided marketing costs and pricing are remunerative. Organic farming can succeed in a big way with proper research and extension inputs, coupled with incentives for marketing.

The government of India has sanctioned Rs. 75 lakh for improvements of soil health in 2002-03, to popularize the centrally sponsored organic farming scheme. The following components are being covered under this scheme:

1. Green manuring
2. Verming composting
3. F.Y.M.

Information boost: Information technology is yet to make inroads in the development of agriculture in India. In advanced countries, every village is interconnected with the county office and the state headquarters, for a free flow of information about agricultural operations, weather, marketing structure and crop intelligence, and price trends, besides many other issues concerning crops and allied activities. Computers have become common household items with the farmers, because the information available is so huge that the farmers sieve through it carefully to extract what is of use for them in the context of their problems. The farmer can get in touch with experts to seek their advice

in no time, on day-to-day problems of crop growth animal health etc. Informatics-led agricultural development is a step towards precision agriculture and enhances the quality of life of the farming community. There is need for a sophisticated information and communication technology (ICT) network with farm and non-farm linkages for the sustainable development of agriculture in Punjab.

Punjab is a progressive agricultural state and the agricultural university is the brain behind the supply of information. When inter-connectivity and the information base are strengthened, at least up to district headquarters at the beginning, and subsequently to each Panchayat, access to information will increase many times and so will productivity. The time has come for the networking system to be put in place to give another boost to sagging agriculture in the state.

Export production: With the introduction of WTO the expectation was that states with surplus agricultural produce would be able to export their material and earn profits. But these expectations have been belied, because of inability to access the world market on account of competitiveness and quality requirements. In 1998, the share of agricultural and allied products in the total export of Punjab was about 54 per cent, according to Punjab Small Industries and Export Corporation. This includes cotton textiles, yarn, readymade garments and hosiery.

Punjab produces eight million tonne of surplus wheat, which is available for export, but most of it cannot be exported because of inability to reach quality requirements. Only durum wheat, which is good for pasta and pizza, is being exported. Similarly, Basmati rice produced in Punjab is quite competitive and so is cotton. Scope for exporting fruits and vegetables to neighbouring countries of the Middle East and Southeast Asia is high. But uncertainties in deliveries of required quality and quantities often make exports unpredictable. Technological breakthroughs in biotechnology, tissue culture, greenhouse technology, etc., have to be achieved, to acquire an edge over other countries. Exports can be further boosted when fruits and vegetables are processed and packed according to international specifications. Punjab has had some success in the export of such processed vegetables, as *sarson ka saag*, tomato ketchup, mixed pickles, squash, fruit jam, honey and spices marketed by MARKFED. Dehydrated peas are also exported. However, while a great potential exists for export, the quantum of fruits and vegetables processed for the purpose is very small.

Exports of dairy products in the form of ghee is limited to the Middle East and the Gulf countries. Other dairy products have a potential, which is still to be exploited. Similarly, there is a market for meat and meat products abroad, but the potential has not been realised because of competition from European countries.

Floriculture, however, is a preferred item for export because of the climatic advantage. The benefit of climate allows certain flowers to be grown at a time when these are not available in the western countries. Punjab, being land-locked, export of perishable material such as flowers, fruits and vegetables are at disadvantage, which can be removed by opening up the northern trade route for export to Afghanistan, the Central Asian Republics and the East European countries.

Problems that the exporters of Punjab face are no different from those of other states. Both pre-shipment and post-shipment problems exist, besides transportation and infrastructural difficulties. Absence of market intelligence is hampering export promotion, as international requirements of quantity and quality inputs and pricing are not instantly available. A networking system is needed to overcome this problem. Punjab has set up a new company called Punjab Agro Export Corporation Limited (PAGREXO) on the

pattern of AGREXO of Israel. All agricultural items exported by Israel to different countries are branded under the name of AGREXO. Similar is the objective of PAGREXO. PAGREXO has been successful in exporting kinnows, grapes and a few selected vegetables, such as okra, bittergourd, melons and tinda. This corporation is a boon to exporters, as it tackles most of the pre-shipment problems and also carries out some post-shipment measures. Such a corporation should be managed well to boost exports.

DIVERSIFICATION OF FARMING SYSTEM

It was the compulsion of the acute food shortage in the country in the sixties that made the Central Government give a fillip to the production of foodgrains. Several policies were framed at the Central and State levels to give a boost to foodgrains production. Punjab contributed significantly to these efforts and played a leading role in ushering in the green revolution in India. Now a situation has come when the granaries of Punjab, as well as of the Centre, are overflowing with foodgrains. Even then, the emphasis on foodgrains production in Punjab is continuing, primarily because of guaranteed purchase by government at administratively fixed prices. As a consequence, crop production in Punjab has progressively become less diversified. Problems arising from the limited diversification of cropping activities prompted the state government, as early as 1985, to appoint a committee for suggesting remedial measures. Popularly known as the Johl Committee, it recommended shifting 20 per cent of the area under the wheat-paddy system to such crops as maize, oilseeds, sugarcane, fruits, vegetables and forests (Table 20). It also suggested introduction of dairy enterprises on a large scale, for which the area under fodder crops had to be doubled, from 0.7 million to 1.4 million hectares by the year 2000. Despite these recommendations, the area under rice and wheat increased steadily, mainly due to assured remunerative prices offered for these crops. Clearly, the committee's recommendations received scant consideration from government as well as from the farming community.

Table 20
Area of Different Crops Based on Recommendations Made by Johl Committee (1986) and Actual Observed Area (Million Ha) in 1999-2000

Crops	Actual area	Proposed area		Area present (1999-2000)	The trend	
	1985-86	1990-91	2000-01		Suggested	Actual
Wheat	3.15	2.90	2.40	3.39	-	+
Paddy	1.70	1.52	1.25	2.60	-	+
Maize	0.26	0.30	0.40	0.16	+	-
Pulses	0.20	0.29	0.38	0.11	+	-
Other foodgrains	0.16	0.19	0.20	0.04	+	-
Total foodgrains	5.47	5.20	4.63	6.30	-	+
Rapeseed & Mustard	0.15	0.23	0.30	0.06	+	-
Other Oilseeds	0.06	0.09	0.18	0.10	+	+
Total Oilseeds	0.21	0.32	0.48	0.16	+	-
Sugarcane	0.10	0.13	0.20	0.11	+	..
Cotton (American)	0.47	0.55	0.68	0.48	+	..
Cotton (Desi)	0.09	0.10	0.12	0.09	+	..
Vegetables including Onions	0.04	0.05	0.20	0.14	+	+
Fruits	0.04	0.08	0.13	0.07	++	+
Fodders	0.72	0.90	1.41	0.61	++	-
Forests	0.28	0.40	0.56	0.28	+	..
Total Cropped area	7.17	7.40	8.20		+	+

Note: + Increase - Decrease .. Stagnant (no trend) ++ Increase to double or even more

Source: M S Bajwa, 'Strategies for Agricultural Research and Development' quoted in *Future of Agriculture in Punjab*, Published by CRRID, 2002

The farmers have found the paddy-wheat combination relatively more remunerative and less risky due to assured pricing and guaranteed purchases. Options for growing other crops, suggested from time to time, have failed due to a relatively higher order of instability in their crop yield, low return and poor marketing facilities. The study by Ramesh Chand (March 1999) has proposed three types of diversification options for Punjab: i) items of mass production and consumption – small-scale enterprises, such as dairying, growing of pulses and oil-seeds; ii) concentration on area-specific enterprises of moderately high-value commodities in different agro-climatic zones and sub-zones, such as cotton, vegetables, potatoes, sugarcane, basmati rice, etc., to enhance the income of farmers; and iii) limited zone/site-specific diversification through non-conventional high-value crops for elite consumption, such as floriculture, exotic vegetables, mushrooms, etc., which are perishable and require specialized marketing. Medicinal, aromatic and spice crops are also a site-specific alternative for bringing about diversification in small areas in Punjab.

Several other options for diversification have been suggested from time to time and some of these have also been experimented with in Punjab. Sunflower and soyabean were introduced as alternate crops and their cultivation was extensive in the state. However, after a few years, farmers began to abandon these crops, because prices fluctuated year to year and marketing became a problem. The failure of this experiment has made Punjab farmers cautious about undertaking any further experimentation on diversification. Returns from the options suggested by expert scientists are generally lower than the existing wheat-rice cropping pattern practised by the farmers.

Constraints to diversification from wheat and paddy crops can be removed when the suggested alternative crops become remunerative, have ready accessibility to markets and are free from risks of attack by pests and diseases. The need and urgency to grow legume, pulses and oilseeds is high, because the country imports these products every year. The problem these crops face is that although a support price is announced for them, procurement through the regulated market is not in place. Even the returns from these crops do not favourably match those of wheat or paddy. In order to encourage the cultivation of pulses and oilseed crops in particular, some incentives are needed to compensate the farmers for the shift from wheat/paddy in an appropriate manner.

Shifting to cultivation of fruits and vegetables, including off-season and exotic vegetables, flowers, medicinal plants, etc., are other alternatives which experts have suggested by experts from time to time. Diversification into other allied sectors of dairy farming, fisheries, mushroom growing, etc., have also been mentioned. These suggestions, though seemingly attractive, are capital-intensive and full of several risk factors including demand, marketing, processing and consumption.

Factors that have encouraged the Punjab farmer to grow more and more wheat and paddy over the years, namely minimum support price and assured procurement, cannot and should not be allowed to remain operative in the present situation. A gradual withdrawal, reduction or modification in these support measures is needed, which in turn will prompt the farmers to diversify from these crops. At the same time, an alternative package of options should be made available to the cultivators, so that the adjustment to new crops takes place smoothly.

Institutional agencies have to come forward to provide suitable credit for the production of crops involving high capital. For other groups of crops, pricing, marketing and risk factors have to be thoroughly worked out. The Punjab farmer has become very commercialized and venturing to cultivate any new crop is viewed from different angles

before adoption. A strong research and development base, coupled with strong extension activity, is needed to convince the farmers about diversification from the present cropping system. A suitable policy framework has to be developed to extend the idea of diversification to a select group of crops in well-designated areas of the state, through a strong base of research and extension. It may also require financial incentives for which a relevant policy needs to be framed.

The state government is now making concentrated efforts to induce changes in the cropping pattern. Tables 21 and 22 show the state government's plan for bringing about crop-pattern changes in the Kharif and Rabi seasons during the Tenth Five Year Plan. The state government is even actively considering a proposal to provide monetary compensation to the tune of Rs. 10,000 per ha for achieving targeted changes in the cropping pattern.

Table 21
Targets for Different Agricultural Crops for the 10th Five Year Plan (2002-07) for Kharif Crops (Area in ,000 hectares)

Crop	Present area 2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Area to be shifted from rice to other crops
Rice	2506	2230	2100	1900	1700	1500	-1000
Basmati rice	105	150	175	200	225	250	+145
Maize	164	200	220	250	300	350	+186
Bajra	5	7	10	15	20	25	+20
Kharif Pulses	41	50	70	90	110	130	+89
Kharif Oilseeds	23	30	35	50	60	80	+57
Sugarcane	121	150	170	180	200	220	+100
Cotton	474	625	640	675	700	725	+251
Vegetables, fruits, fodder and agro-forestry	455	452	474	534	579	614	+159
Total area sown in Kharif	3894	3894	3894	3894	3894	3894	+1007

Source: Data provided by Department of Agriculture, Punjab

Table 22
Targets of Different Agricultural Crops for the 10th Five Year Plan (2002-07) for Rabi Crops (Area in ,000 hectares)

Crop	Present area 2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Area to be shifted from wheat crops to other
Wheat	3400	3100	2935	2790	2630	2400	-1000
Durum Wheat	10	100	150	200	250	300	+290
Barley	33	45	50	55	60	65	+32
Rabi Pulses	18	40	60	75	105	125	+107
Rabi Oilseeds	54	135	175	200	225	250	+196
Sugarcane	10	25	50	75	100	150	+140
Rabi, fodder, vegetables, fruits, agro-forestry	320	400	425	450	475	555	+235
Menthe, Celery floriculture Ornamental trees	0.20	0.25	0.30	0.35	0.40	0.45	+0.25
Total area sown in Rabi	3845.20	3845.25	3845.30	3845.35	3845.40	3845.45	1000.25

Source: Data provided by Department of Agriculture, Punjab

ANIMAL HUSBANDRY AND DAIRY FARMING

Dairy

Punjab is also important for its dairy products. Unfortunately, however, the yield of milch animals and their total production in the state is not in consonance with the levels attained in developed countries. In 1966, Punjab had 15 lakh buffaloes and 10 lakh cows. These numbers have now increased to 37 lakh buffaloes and 12.5 lakh cows. During the last two decades, the area under fodder crops has remained around seven lakh hectares, constituting less than 10 per cent of the total cropped area. The per day availability of fodder in the state works out to about 10-12 kg per animal against the national average of five kg per animal. The optimum requirement is 40 to 50 kg per animal. Obviously, the milch animals are under-nourished and hence produce less milk.

On an average, a buffalo in Punjab yields about 1,300 litres of milk in its lactation period of about 210 days. The inter-calving period is 15 to 18 months. In the case of crossbred cows, the average lactation yield is over 3,500 litres of milk with a calving interval of 12 to 14 months. Unfortunately, consumers in Punjab do not like cow's milk, because of its low fat content and yellowish colour, whereas all over the world cow's milk is in demand. The per capita availability of milk is about 870 gm in Punjab against 204 gm for India, 592 gm for Haryana and 330 gm for Himachal Pradesh (1998).

Livestock enterprises account for about 14 per cent of the state domestic product of Punjab, which is one-third the share of agriculture. For a herd of 10 animals, the cost has been worked out to be Rs. 2,64,000 for a buffalo-herd unit and for a crossbred cows-herd unit it is Rs. 2,98,000 per lactation period. However, the net income is estimated, at Rs. 31,803 for crossbred cow as against Rs. 20,672 for buffalo-herd units (Joginder Singh and Dhaliwal, 2002). The higher profitability of a crossbred cow-herd unit is because of a higher milk yield.

Due to heavy pressure of growing wheat and paddy, the area under fodder has been decreasing, and so has the composition of the live-stock population. During 1977-1997, the total bovine population increased by nearly 19 per cent, but, while the population of cattle as a whole decreased by 20 per cent, the stock of buffaloes increased by more than 50 per cent (Table 23). As a viable means of diversification, cultivation of fodder has to increase along with increase in livestock population, in order to make it more productive. In such countries as USA, Canada, Israel, Denmark, New Zealand and others, dairy farming as an enterprise is very successful and crossbred cows have an average lactation milk production of 10,000 litres per cow. This suggests that there is a tremendous possibility for increasing cow's milk production if scientific methods are used. Such an increase in buffalo's milk production is difficult, as high milk-yielding genetic stock is not available.

Table 23
Livestock and Poultry (in '000) in Punjab (in '000)

Year	Cattle	Buffaloes	Horses & Ponies	Donkeys	Sheep	Goat	Camel	Total livestock	Poultry
1972	3390	3796	50	65	388	537	102	8646	3017
1977	3312	4110	76	61	498	722	74	8996	5539
1990	2832	5578	33	36	508	537	43	9678	15276
1997	2639	6171	34	23	436	414	30	9857	11457

Source: *Statistical Abstract, Punjab*, various issues

There is also considerable scope for reducing the cost of milk production by: a) improving the animals through crossbreeding and introduction of a exotic breeds; b) improving the feed and making it more balanced and nutritious; and c) proper management under hygienic conditions.

In order to make dairy enterprises economically attractive the aim should be:

- Developing herds of crossbred cows with lactation yield of not less than 5,000 litres.
- Calving at two and half years of age and with a calving interval of 12 to 14 months.
- Import of a substantial number of pure breed exotic cows with lactation yield of not less than 5,000 litres and calving at two years of age with a calving interval of 12 months.
- Drastic reduction in dependence on buffaloes.
- Retaining and developing only a limited number of buffalo herds, yielding a minimum of 2,500 litres of milk per lactation.
- Scientific herd management system and livestock breeding policy.

The PAU has recommended cross-breeding of cows with the use of Jersey cows in the sub-mountain rain-fed areas and Holstein Friesians in the plains region of Punjab. The nutrient component of milch animal deserves special attention, as most of the present herd are under-nourished.

The state has abundant roughage (wheat and rice crop), which can be used in making silage through processes developed by PAU. Additional nutrients can also be added to this silage. Authentic frozen semen from pedigree bulls is necessary for cattle breeding, need which, if necessary, may be imported from designated countries. Animal health is another component, which has to be put on a strong footing, so that the optimal use of potentials of animals is maintained.

Milk production

Punjab has 49 milk plants in the co-operative and private sectors with a handling capacity of 50 lakhs litres of milk per day. Of these, 11 milk plants belong to Milkfed Punjab, which handles over 15 lakh litres milk per day. Nine of these plants manufacture milk powder, ghee and pasteurized milk in pouches. The 28 milk plants in the private sector, with a capacity of 35 lakhs litres per day, manufacture milk powder and ghee. Some multinational companies, such as Smith Kline & Beecham, Wockhardt Limited, etc., do not make pasteurized milk but manufacture special value-added milk products for sale in India and abroad. Several of these milk plants are unable to procure enough milk due to competition with each other and, as a result, 35 to 45 per cent of their installed capacity remain idle. Some of the milk plants in the private sector have already closed down and some are on their way out. The situation demands urgent steps to revive the dairy industry by supplementing milk for the use of milk plants.

Although the Prevention of Food Adulteration Act is applicable to milk and milk products, in practice it is seldom applied to retail vendors. However, it is rigorously applied in organized dairies. The unhygienic conditions prevailing in small dairies and city-based

'*dudhias*' is not only dangerous to milch animals from the health point of view, but even consumption of such milk, which is obtained unhygienically, is harmful to consumers. Unfortunately, little is being done about the hygiene of milch cattle and of the process of milking the cattle and storage and distribution. Introduction of high technology for producing hygienic milk for consumption and maintaining proper health of the milch cattle, have assumed extreme urgency.

OTHER ANIMALS AND THEIR PRODUCTS

Piggery: Rearing pigs as a commercial venture is still to be established on a sound footing in the state. Economically, it is a very active biological feed converter with a ratio of 1:4. Its meat is highly rich in fats, and bacon and other meat products made out of it are of great commercial value both in India and abroad. However, scientific methods of pig rearing are not readily available to pig keepers; hence, most of the animals remain scavengers and as such their meat can be harmful for human consumption. On the other hand, a well organized pig rearing stall can be of great economic value, where pure exotic breeds are maintained in hygienic conditions and fed with balanced diet. Consumption of its meat can increase and its byproducts could be exported.

Poultry: In Punjab, poultry grew phenomenally during 1977 to 1990, when the number jumped from 30 lakh to 152 lakh, but declined to 115 lakh in 1997 (Table 21). This decline is attributed to reduced profitability and increased competition from the poultry industry of South India. Besides meat, 2,630 million eggs are also produced by the chickens. On an average 240 eggs per layer per annum are produced, whereas well-bred chickens of Denmark, Australia and the Netherlands produce anywhere between 300 to 350 eggs per layer per annum. Chicken breeding needs improvement both for meat and egg production. Even proper feeding and healthcare can improve meat and egg production from the existing stocks considerably.

Rabbits: Rabbits are prolific layers, herbivores and can efficiently convert fodder to food. They can convert plant protein of little value into 20 per cent of high value edible meat. Comparable figures for other species are 20 to 23 per cent for broiler chicken, 16 to 18 per cent for pigs and eight to 13 per cent for beef. Rabbit meat production is economically cheap and is an attractive proposition, especially when the aim is to produce quality animal protein. Russian Chinchilla and New Zealand whitebreed rabbits have given very encouraging results in meat production, i.e., about 1.6 to 2 kg meat in 84 days. Over 2,000 of these can be raised on one acre of land producing berseem and lucerne. Rabbit's skin is also a saleable product, which can fetch much money depending upon the breed. Angora-wool rabbits provide an additional source of income as the wool, used for woollen garments for infants, is quite expensive and much in demand. Development of rabbitries, if properly encouraged is economical and remunerative for small-scale ventures.

Sheep and goat: Sheep and goat rearing has a stigma attached to it among Punjab farmers as it is considered to be an enterprise meant for Scheduled Castes and marginal and small farmers. The population of goats and sheep in 1997 was 12,20,000 and over a period of 20 years it has come down to 8,50,000, a decline of more than 30 per cent (Table 21). Milk, meat and wool are the main products of goat and sheep. Little has been done by way of research for the improvement of their stock. Wool production has been picking up for sometime in the past, but meat production is still in the unorganized sector. There is urgent need for improving breeds of goats and sheep for quality wool,

increased meat and milk production, and for scientifically organized abatoires for hygienic processing of meat and its products.

Byproducts of animal wastes are very useful, as hides, skins, horns, bones, animal fat, bristles, blood, hooves and hair can be profitably exploited for diverse purposes. Many medicines are derived from various organs and excretions of these animals, which have great value in the pharmaceutical industry. At present, byproducts, except skins and hides, are of little value. Considerable scope exists in the scientific utilization of the by-products of these animals with economic benefits.

Fisheries: After the green and white revolutions, Punjab is now on the threshold of a 'Blue Revolution'. A trend has already been set in favour of diversification to fish farming. Farmers are engaged in intensive fish culture in ponds and tanks on modern scientific lines through composite fish culture of fast growing species. There is great potential for pisciculture in the state. Fisheries' resources of Punjab comprise 868 km of river, 11,200 km of canal, 5,804 hectare of small water reservoirs and lakes. In addition, there are 7,185 village ponds covering an area of 4,730 hectare, which are suitable, or can be made suitable, for fish culture after some renovation and water-supply arrangements. Besides, there are 5,228 village ponds covering an area of 2,664 hectare, which require major renovation to make these fit for fish culture. Some farmers have also started fish tanks on their farm-land as a measure of diversification because of its lucrativeness (*State Industrial Profile of Punjab*, Ludhiana, 2001).

The economics of fish farming is quite attractive, as returns over variable cost under proper management practices are nearly one and half times those of paddy-wheat rotation. The only capital expenditure involved is deep excavation of land for fish ponds. Fish culture is a highly specialized occupation and requires technical skill in production and marketing. The state government has arranged to provide fish fingerlings for fish cultivators, but has not taken care of skill upgradation, pricing and marketing. If these are provided, inland fish farming can be a very profitable enterprise for medium and large farmers.

Apiculture: Punjab Agriculture University (PAU) has been encouraging bee farming and a large number of farmers have taken up this enterprise successfully. Since 1978, the number of bee keepers has increased from 34 to 1,25,000, beehives from 165 to 1,25,000 and honey production from seven to 2,200 tonne per annum. Dabur India Limited has given further boost to honey production in the state by entering the market for the purchase of crude honey. With more corporate sector firms entering this arena, and inputs of improved technology, honey production can further improve, particularly by involving small and marginal farmers.

Sericulture: Since 1994, sericulture has come under the jurisdiction of horticulture. There are 16 government sericulture farms. Over two lakh mulberry plants have been planted and distributed in the kandi areas. This activity is confined mostly to the kandi areas and the sub-mountain regions, where plantations of mulberry are available and a government agency undertakes to collect the cocoons. Absence of silk-weaving factories and collection centres are limiting the progress of this enterprise. Though it is a cottage industry which can give employment to women and small farmers in particular, it is not yet receiving due attention.

DEVELOPMENT OF HIGH VALUE AGRICULTURE

Horticulture: Fruits; The diversity of physiographic, climatic and soil characteristics of Punjab allows successful cultivation of a variety of fruits, vegetables and flowers. There was a three-fold increase in the area under fruit production during 1981-82 to 1995-96, but in 1999-2000 there has been a considerable decline in the area under fruits. A total of 4,18,639 tonne of fruits were produced in the state during 1999-2000. However, there has been a decrease in production of 47 per cent in citrus, 16 per cent in mango, 11 per cent in guava and seven per cent in pears (Table 24). The per capita availability of fruits is 56 gm against the minimum recommended requirement of 85 gm. It is, therefore, essential that fruit cultivation in Punjab is taken up on a large scale, as a means of diversification, and to fulfill fruit requirements for table consumption, besides the processing industry.

Table 24
Area (Hectare) under Different Fruits and Vegetables in Punjab

Commodity	1981-82	1991-92	1995-96	1999-2000 (p)
Fruits				
Kinnow	3883	11807	26645	1434
Orange & Malta	5853	10987	13170	3317
Lemon	509	1096	1258	668
Mango	6817	11581	15211	5608
Litchi	336	1386	1990	1146
Guava	2853	4015	5833	4357
Pear	3616	7427	8226	2147
Peach	1038	3137	4237	1101
Plum	233	372	336	120
Grapes	308	2187	2336	1378
Ber	698	1671	2523	1735
Miscellaneous	2703	3258	3657	1198
Total fruits	28847	68835	84422	34209
Vegetables				
Potato	32715	30919	39095	63993
Topica	369	68	21	---
Sweet potato	432	55	30	4
Onion	1267	950	1615	2032
Other winter vegetables	12882	16246	14816	23864
Other summer vegetables	16160	12647	11812	20573
Total vegetables	63825	60848	77309	110266

Source : *Statistical Abstract of Punjab*, 1982, 1992, 1996 and 2000

Note : **P** = Indicates Provisional Estimate
R = Indicate Revised Estimates

Among citrus fruits, kinnow, lemon, oranges and malta are dominant. Productivity of these fruits in Punjab is around eight tonne per hectare, while in Andhra Pradesh it is 15, Karnataka 11 and Bihar 10 tonne per hectare. In Israel the productivity of kinnow is 65 tonne and orange 43 tonne per ha. The low productivity in Punjab can be ascribed not only to poor management and biotic stresses, but also to the use of imperfect technologies and poor quality plant material, which can be easily improved through scientific methods.

Grape cultivation also picked up in the state during 1991-92 to 1995-96, but has gone down considerably in recent years. The State Department of Horticulture entered into an agreement with the Israel Government for improving the quality of Perlette grapes in the state. During 1998-99, 205 hectares were covered for improvement. Grape productivity has improved, but remains far behind the international level. The situation with regard to other fruits is also similar.

The reasons for poor performance in fruit tree cultivation appear to be:

- Trees have become old and have been cut down without replacement.
- High yielding, certified and quick maturing plant materials are scarce.
- Diseases and pests are taking a heavy toll.
- The marketability of fruits is complex and uncertain
- Price structure fluctuates every season and is not remunerative.
- Lack of value addition, processing, storage and transportation facilities.
- Support to research and development is inadequate.

Efforts have to be made to overcome these impediments before fruit cultivation becomes attractive and remunerative.

Vegetables: Vegetable cultivation in the state has been on the increase since the last decade and the area under vegetables is more than one lakh hectare, out of which three-fourths of the land is under potato. PAU is a forerunner in generating hybrid seeds of certain vegetables including muskmelon, cucumber, egg plant, okra, chillies and tomatoes. Hybrid crops have given higher yields and higher returns to the farmers particularly when marketed in the cities. The state government has set up vegetable-seed farms at different places, which also serve as demonstration centres. Seedlings produced in these centres are supplied to farmers for cultivation. The popularity of the cultivation of red chillies has increased in recent years as dry chillies give good returns. The production of some of the vegetables is so high that often the market crashes and the cultivators suffer heavy losses because of the glut. Such crops as tomato, potato, onion and cauliflower are subject to gluts in different areas and as a result the farmers even do not harvest the crops. This clearly demonstrates that the potential of vegetable cultivation is high in the state but, due to lack of proper marketing and a processing industry, their off-take will depend a great deal on market forces.

Cultivation of off-season vegetables is yet to take off in the state. The technology is available and can be profitably employed by progressive vegetables growers of the state, with the financial backing of the state government. Such exotic vegetables as celery, broccoli, asparagus and leafy vegetables, such as basil, etc., are valuable crops preferred by foreign tourists. Their cultivation can fetch remunerative returns.

Cultivation of vegetables is capital- and labour-intensive, besides being risky. Most of the vegetables are grown for table purposes, while some are exported to the neighbouring states of Haryana, Himachal Pradesh, Jammu & Kashmir and Delhi. One of the options of diversification from wheat and paddy is vegetable cultivation. This can only succeed if the area under vegetables is increased and processing units, cold storages and dry freezing plants are established in areas where vegetables are grown. Suitable policy directions are needed so that vegetable-growing areas are delimited and get increasing support from industry. The corporate sector can play a pivotal role in establishing the required processing units, for which encouragement should come from the state

government and financial institutions. Above all, research input is a vital ingredient in increasing the quality and quantity of vegetables.

Flowers: Cultivation of flowers has attracted the attention of farmers and it is gradually increasing because of high demand in domestic and international markets. Production technologies have been perfected for gladiate, chrysanthemum, carnation, marigold and rose. Marketing avenues, pricing, cold-storage facilities and transportation are some of the bottlenecks in extending their cultivation.

Other agricultural activities

Mushroom cultivation: There are three button mushroom spawn producing laboratories functioning at Patiala, Jalandhar and Hoshiarpur. These centres besides supplying the spawn also train the farmers for growing mushroom and provide suitable readymade compost at subsidized rates. During 1998-99, about 1000 tonne of button mushrooms were produced in the state.

During 1980-81 to 1990-91, mushroom cultivation had become popular in the state and a maximum of 35,000 tonne of mushroom per year were being produced. Subsequently the production declined because of lack of market and processing facilities for making soups and other value added products. Oyster mushroom and paddy straw mushroom cultivation can make this enterprise a round the year activity. This venture, given marketing, processing and pricing support can flourish to the advantage of small farmers.

Aromatic plants: The cultivation of aromatic plants, such as mentha, lemon grass and others, has been taken up by some farmers on an experimental basis. Some subsidy is also being given for mentha cultivation and about 40,500 hectare area was under mentha during 1998-99. Oil-extraction plants have been set up where the harvested mentha is consumed. Growers get adequate return from this crop. Similar arrangements can be made for other aromatic crops in the state, which could encourage diversification.

Development Strategies in the Context of Liberalization and Globalization of Agriculture (WTO)

Agreement on Agriculture (AOA) came into force with the establishment of the World Trade Organization (WTO) on 1 January 1995, to establish 'a fair and market-oriented agricultural trading system'. The likely impact of this agreement has been greatly contested in India in general and Punjab in particular. Now that India is a signatory to WTO, many challenges have come up before the country (Ghuman, 2002). It aims at eliminating distortions in global trade of agricultural produce by:

- Lowering of domestic support to agriculture.
- Replacing all non-tariff barriers and eventually slashing down even tariff barriers.
- Providing access to the market of each member country.
- Lowering export subsidies in agricultural trade.

Unlike developed countries where agriculture is a business, in India agriculture is to a large extent a means of livelihood. Under the agreement, the member countries are obliged to gradually open up the agricultural sector to world trade. In this context, Trade Related Intellectual Property Rights (TRIP), social clauses and labour issues have a

special impact on Indian and Punjab agriculture in particular. Once export restrictions are removed it will be possible to export agricultural produce to international markets. However, volatility of world prices will definitely have an impact on domestic prices. It is expected that agriculturally developed regions like Punjab will gain in the long run from trade, because of opportunities for tapping export markets. But much will depend on the supply-side constraints that bedevil the agricultural market. Improvement in product quality has to be brought to international standards. It was with this concern that the Punjab Government appointed a committee under the chairmanship of Professor Y K Alagh to look into various aspects of WTO affecting Punjab. Some of its preliminary findings and recommendations are given below:

- Punjab's agriculture has been structured to produce foodgrains in response to the national mandate. To meet the emerging challenges, a concrete programme of diversification and raising value addition in each agro-climatic region of Punjab depending upon its soil and water reserves has to be developed.
- The new programmes must be provided financial and organizational support. It is estimated that an agricultural adjustment fund of Rs. 550 crore for three years would be required for the programme for quality upgradation, trading arrangements for foodgrains and diversification to high level sectors.
- At the Centre agricultural trade must be taken more seriously so as to provide an institutional system, including commodity board and insurance, etc., so as to be able to survive fluctuations that occur in world trade.
- Trade-efficiency would depend upon the level of production, marketing, processing, transport, etc. In general, Punjab farmers are at a considerable disadvantage compared to developed countries. Because of high transportation costs, wheat from Punjab will cost more at Mumbai than that coming from Australia.
- Recognized and strong farmer agencies need to be created who could collectively represent the farmers in the market to look after their skill and information-needs, market facilities and intelligence and credit-needs. Such an agency can provide export subsidies to farmers with small quantity of export surpluses under 'Green Box' measures.
- Punjab could also take advantage of backward area development exemption (Resource Poor Zones) for border areas, Kandi belt, etc., by providing infrastructure under 'Green Box' measures.

As such, the export competitiveness of Punjab agriculture is quite limited, as its main agro-products are wheat, rice and sugar, but it is competitive internationally only in cotton. Another crucial factor affecting competitiveness is cost of cultivation and yields of different crops. For this the Agricultural University has to play a lead role in devising ways and means for cost effectiveness in crop production.

Johl (2001) has argued that a farmer in a structurally distorted domestic market cannot be expected to compete cost effectively in a competitive globalized market. It has been suggested that answers to the emerging problems are to create a conducive environment in the agricultural sector to promote commercial farming and minimizes recourse to subsistence farming. Johl has made the following suggestions in this regard:

- An effective land market must be developed, which allows viable farm units to grow. The land-lease market must be streamlined so that larger farm units are created, which become commercially viable, start producing more and generate

employment. For creating effective land markets some of the agrarian laws will have to be amended.

- The administered pricing policy and procurement system must play a pro-active and complementary role to encourage production, keeping in view market demands. A shift from wheat and rice cultivation is urgently needed in favour of oilseeds and pulses.
- The variety of subsidies, provided directly or indirectly to farmers to facilitate crop production, needs a critical review and re-orientation so that these could be transferred to 'Green' or 'Blue Box' subsidy. This adjustment will be highly complementary and effective in rationalizing pricing and procurement policies and in meeting requirements of WTO regimes as well.
- Besides producing more per unit area, value addition and quality improvement of farm produce is the need of the day.

The western countries have commercialized the business of agricultural commodities by mere grading and packing the produce as it generates better demand and better prices. In Punjab, the concept of 'food parks' has been envisaged to process and market the produce as the advanced countries do, so that value addition increases sale and profitability.

Research and extension programmes are basic ingredients for the success of crop production activities. These have to operate as a link between the producer and the market, so that the producer's interests are kept above board and he is allowed to adjust his production programmes in accordance with market requirements of kind, quality and quantity. Under the WTO framework, Punjab agriculture should undergo a paradigm shift in strategy. From a 'production-driven' agriculture, we have to move to a 'demand-driven' one. For this, government needs to spend liberal amounts on R & D, infrastructure for the agro-processing industry, seed, biotechnology and product-quality development. This assumes more importance in view of the declining trend in public investment in agriculture. The challenges are enormous and must be met, if Punjab is to remain a leader in agriculture.

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Chapter 5

RURAL DEVELOPMENT

INTRODUCTION

There are no universally accepted approaches to rural development. It is a choice influenced by time, space and culture. The term rural development connotes overall development of rural areas to improve the quality of life of rural people. In this sense, it is a comprehensive and multidimensional concept, and encompasses the development of agriculture and allied activities, village and cottage industries and crafts, socio-economic infrastructure, community services and facilities and, above all, human resources in rural areas. As a phenomenon, rural development is the end-result of interactions between various physical, technological, economic, social, cultural and institutional factors. As a strategy, it is designed to improve the economic and social well-being of a specific group of people – the rural poor. As a discipline, it is multi-disciplinary in nature, representing an intersection of agriculture, social, behavioural, engineering and management sciences. (Katar Singh 1999).

In the Indian context rural development assumes greater significance as 72.22 per cent (according to the 2001 census) of its population still live in rural areas. Most of the people living in rural areas draw their livelihood from agriculture and allied sectors (60.41 % of total work force), and poverty mostly persists here (27.1 % in 1999-2000). At the time of independence around 83 per cent of the Indian population were living in rural areas. Accordingly, from the very beginning, our planned strategy emphasized rural development and will continue to do so in future. Strategically, the focus of our planning was to improve the economic and social conditions of the underprivileged sections of rural society. Thus, economic growth with social justice became the proclaimed objective of the planning process under rural development. It began with an emphasis on agricultural production and consequently expanded to promote productive employment opportunities for rural masses, especially the poor, by integrating production, infrastructure, human resource and institutional development measures.

During the plan periods, there have been shifting strategies for rural development. The First Plan (1951-56) was a period when community development was taken as a method and national extension services as the agency for rural development. Co-operative farming with local participation was the focus of the Second Plan (1956-61) strategy. The Third Plan (1961-66) was the period of re-strengthening the Panchayati Raj System through a democratic decentralized mechanism. Special Area Programmes were started for the development of backward areas in the Fourth Plan (1969-74). In the Fifth Plan (1974-79), the concept of minimum needs programme was introduced to eradicate poverty in rural areas. There was a paradigm shift in the strategy for rural development in the Sixth Plan (1980-85). The emphasis was on strengthening the socio-economic infrastructure in rural areas, and initiatives were taken to alleviate disparities through the Integrated Rural Development Programme (IRDP). During the Seventh Plan (1985-90), a new strategy was chalked out to create skill-based employment opportunities under different schemes. Special programmes for income generation through creation of assets, endowments and land reforms were formulated for participation by the people at the grassroots level.

The focus of the Eighth Plan (1992-97) was to build up rural infrastructure through participation of the people. Priorities were given to rural roads, minor irrigation, soil conservation and social forestry. Strategic changes were made in the Ninth Plan (1997-2002) to promote the process of nation-building through decentralized planning. Greater role of private sector was also ensured in the development process.

The Ninth Plan laid stress on a genuine thrust towards decentralization and people's participation in the planning process through institutional reforms. It emphasized strengthening of the panchayati raj and civil society groups for promoting transparency, accountability and responsibility in the development process. The role of the government, in general, had to shift, from being the provider, to the facilitator of development processes by creating right types of institutional infrastructure and an environment conducive to broad-based economic development.

The focus of rural development in Punjab has mostly been along the same lines as followed by the Central Government. The state government in its document on the Tenth Five Year Plan (2002-07) and the Annual Plan (2002-03) has strategically re-stressed the following thrust areas:

- (i) Uninterrupted availability of power to agriculture and revitalization of the irrigation network.
- (ii) Greater access to potable drinking water, better roads, better educational infrastructure particularly primary education, and extension of quality health services.
- (iii) Generation of additional employment opportunities in the private sector by promoting investment, improving marketable vocational skills with widespread use of information technology.
- (iv) Upliftment of underprivileged sections by enhancing beneficiary-oriented social security programmes, as well as specific employment generating programmes to increase their income and improve the quality of life.
- (v) Strengthening the process of rural renewal by greater thrust to schemes for reaching out quality facilities to the rural population.
- (vi) Restructuring agriculture to meet the challenges posed by WTO, through the introduction of a programme for 'second push to agriculture and allied sectors' with emphasis on agricultural research, promotion of food processing for value addition, providing marketing infrastructure and support for agriculture including agri-export.

The strategy for rural development in the state can be seen in the expenditure pattern for various development schemes from 1965-66 till date. Table 1 shows the pattern of government expenditure on rural development programmes in Punjab. It shows that high priority was given to setting up local-level administrative infrastructure at the block level.

to promote agriculture and allied activities to meet the foodgrains requirements of the nation during 1965-66 to 1980-81. Simultaneously, as production increased, expenditure on infrastructure development, such as irrigation, communication, pavement of streets and construction of drainage and village betterment also increased. Better infrastructure further helped in increasing production. Subsequently, expenditure on institution building was initiated from 1980-81. Simultaneously, the expenditure pattern on human resource development and empowerment of underprivileged sections of the society were made progressively more favourable for upgrading skills through training for gainful employment and a better quality of life. It may be seen from the Table that significant qualitative and quantitative variations have occurred in the developmental plan strategies in the past.

Table 1
Government Expenditure on Rural Development Programme in Punjab (Rs. in lakn)

S. No.	Major Heads	1965-66	1970-71	1975-76	1980-81	1985-86	1990-91	1995-96	1999-2000	2000-01*	
1	Local Level Administration	63.94 (50.74)	99.77 (71.82)	167.43 (52.17)	251.89 (16.70)	381.55 (12.58)	759.92 (16.65)	6759.87 (30.53)	1839.54 (25.00)	2157.79 (75.58)	
	Block headquarters	63.94	99.77	167.43	251.89	381.55	759.92	6759.87	1839.54	2157.79	
2	Production	34.60 (27.46)	16.10 (11.59)	11.29 (3.52)							
	Animal Husbandry and Agricultural Extension	25.62	6.64	--	--	--	--	--	--	--	
	Rural Arts and Crafts	8.98	9.46	11.29	--	--	--	--	--	--	
3	Infrastructure Development	8.66 (6.83)	5.96 (4.29)	59.86 (18.65)	591.70 (39.76)	1044.26 (34.43)	1394.04 (30.54)	7748.20 (33.36)	1315.43 (17.88)	679.94 (23.80)	
	Irrigation	3.09	0.34	1.74	--	--	--	--	--	--	
	Communication	5.57	5.62	10.97	11.70	19.62	18.76	115.23	151.38	--	
	Pavement of streets and construction of drains	--	--	47.15	450.00	846.47	1325.70	7532.05	*	--	
	Village betterment	--	--	--	--	125.17	--	--	--	--	
	Assistance to Panchayats for Panachayat Ghars	--	--	--	70.00	20.00	18.58	38.36	7.79	2.57	
	Matching grants to Panchayats and social bodies for development workers	--	--	--	50.00	33.00	31.00	62.56	35.02	10.08	
	Development of model villages	✓ --	--	--	10.00	--	--	--	--	--	
	Disposal of sullage water	--	--	--	--	--	--	--	14.85	62.69	
	Community service works through NRIs participation	--	--	--	--	--	--	--	8.00	32.13	
	Primary School Buildings (New Construction)	--	--	--	--	--	--	--	416.57	320.97	
	Financial Assistance to Panchayats, Samitis & Zila Parishads	--	--	--	--	--	--	--	903.57	251.50	
	4	Human Resource Development	18.14 (14.42)	17.08 (12.29)	81.44 (25.38)	53.91 (3.62)	65.87 (2.17)	69.82 (1.53)	6515.94 (28.05)	3187.18 (43.32)	5.89 (0.21)
		Health and rural sanitation	6.86	5.62	45.74	11.70	--	--	6114.70	2213.53	--
Education		5.20	5.80	9.15	11.73	21.32	13.33	350.91	923.18	--	
Social education		6.08	5.66	17.53	24.98	27.07	19.76	49.65	36.78	--	
Composite programme for women and Pre-school children		--	--	9.02	5.50	11.20	9.62	0.68	#	--	
Assistance for integrated development of villages of historical/religious importance		--	--	--	--	6.28	27.11	--	--	--	
Purchase of Punjabi books		--	--	--	--	--	--	--	13.69	5.89	
5		Institutional Development				50.80 (3.41)	49.12 (1.62)	68.20 (1.49)	18.61 (0.08)	27.56 (0.37)	11.36 (0.40)
	Financial assistance to Panchayats, Samitis and Zila Parishads for revenue earning schemes.	--	--	--	42.80	40.00	52.64	0.91	27.56	11.36	
	Promoting and strengthening of Mahila Mandals	--	--	--	8.00	9.12	15.56	17.70	--	--	
6	Employment Generation				540.00 (35.80)	1491.93 (49.19)	2272.02 (49.77)	2224.11 (10.04)	987.57 (13.42)	--	
	Integrated Rural Development Programme	--	--	--	540.00	872.18	1050.47	1125.75	--	--	
	Rural Landless Employment Guarantee Programme	--	--	--	--	619.75	1221.55	1098.36	**	--	
	S.G.S.Yojana	--	--	--	--	--	--	--	987.57	--	
Grand Total		125.35 (100)	138.91 (100)	320.02 (100)	1488.30 (100)	3032.73 (100)	4564.00 (100)	23226.73 (100)	7357.28 (100)	2854.98 (100)	

Source: Statistical Abstracts of Punjab, various issue

Note : * Indicates scheme head changed # Indicates scheme transferred to concerned departments

** Indicates scheme has ceased off. Figures in brackets are in percentage

* Figures taken from Statistical Abstract, Punjab 2001.

PRESENT STATUS OF RURAL DEVELOPMENT

The spread of the green revolution has considerably changed the profile of the Punjab farmer from the old traditional farming to an aggressive and commercialized modern farming system. The green revolution not only brought prosperity to the Punjab farmers, but also changed their psyche, mindset and pattern of living. Structural changes started taking place in the villages. Katcha houses were progressively converted into pucca houses; the proportion of katcha houses which was 33.28 per cent in 1981, sharply declined to 12.40 per cent in 1993-94. All the villages were electrified and road links were developed in almost all the villages. The government hastened to provide irrigation facilities (by providing subsidy for tube wells and free electricity since 1997). Irrigation covers 94 per cent of the total cropped area. Simultaneously, credit facilities for farm mechanization and other inputs were extended. The majority of Punjab farmers now view agriculture as a commercial enterprise and seek more and more facilities and infrastructure support from the government for improving living conditions in the villages.

Considering the overall development that has taken place so far, much more remains to be done for improving the quality of life of rural Punjab, which has a large deprived population, consisting of marginal farmers, landless labourers, besides Scheduled Castes and Backward Classes (Table 2). This component of the population has to be brought into focus for their upliftment, with special emphasis on their skill upgradation, removal of unemployment and *poverty and vertical growth to acquire productive assets* for better living on a sustainable basis.

Level of infrastructure development: Development of physical as well as social infrastructure plays an important role in the overall advance of the rural economy, role by directly contributing to employment generation and asset creation. Improved network of physical infrastructure facilities such as well-built roads, irrigation, rail links, power and telecommunications, information technology, food storage, cold chains, market-growth centres, processing of produce and social infrastructure support, viz., health and education, water and sanitation, and veterinary services and co-operatives are essential for the development of the rural economy, especially in the era of liberalization, privatization and globalization (LPG).

Table 2
District-wise Socio-economic Indicators in Punjab

Region/District / State	Rural pop. growth rate (%) (1991-2001)	Proportion of SC in total population (1991)	Proportion of SC in rural population (1991)	Rural res. HH in tot. HH. (1991)	% - age of marginal holdings (1991)	% age of small holdings (1991)	Rural literacy (%) (2001)			Main worker as %age tot. pop. (1991)	Cultivators (1991)	Agriculture labourers (1991)	HH. Industry workers (1991)	Manufacturing workers (1991)
							Male	Female	Total					
Majha														
Gurdaspur	14.01	24.71	25.36	77.72	36.60	20.30	70.96	77.70	63.58	27.89	29.71	25.85	0.67	6.83
Amritsar	11.72	28.01	32.67	65.95	22.21	17.21	67.83	52.69	60.65	30.67	29.17	24.86	0.45	11.62
Doaba														
Kapurthala	5.65	29.46	31.71	73.62	21.75	20.48	76.27	64.41	70.57	30.07	31.25	20.96	1.42	15.00
Jalandhar	4.80	38.15	44.52	59.31	29.97	17.41	80.14	68.17	74.41	29.49	20.43	20.35	3.25	15.62
Nawanshehar	6.96	38.98	39.74	86.46	--	--	83.15	68.27	75.99	28.83	35.11	28.75	2.28	7.77
Hoshiarpur	10.29	33.85	35.61	82.68	31.96	23.20	86.11	73.87	80.09	27.65	29.00	23.42	2.44	7.79
Malwa														
Rupnagar	12.35	24.35	26.96	69.58	41.42	17.11	81.39	66.91	74.51	29.41	28.72	15.71	1.59	11.26
Ludhiana	12.99	24.50	35.24	46.52	28.91	18.25	78.32	66.73	72.88	31.25	19.70	16.51	0.36	18.94
Firozpur	20.24	21.16	21.98	74.28	25.07	24.02	64.78	45.78	55.75	30.27	39.14	28.05	1.02	5.47
Faridkot	19.71	35.05	38.19	65.97	29.67	16.31	64.18	52.27	58.58	30.16	36.14	26.59	0.91	6.26
Mukatsar	15.40	36.44	39.51	76.43	--	--	61.84	45.49	54.10	31.69	36.41	33.14	1.14	5.24
Moga	12.65	30.39	32.93	80.31	--	--	65.93	55.87	61.18	30.68	42.29	29.54	1.28	5.00
Bhathinda	15.28	29.48	31.91	71.60	14.55	13.56	62.46	47.16	55.30	30.74	40.84	24.97	1.34	5.35
Mansa	11.63	28.91	30.55	83.02	--	--	54.27	40.03	47.56	31.87	47.47	27.15	1.32	4.28
Sangrur	11.53	26.75	29.46	74.12	18.66	13.80	61.93	48.98	55.86	30.93	41.27	25.93	1.40	6.93
Patiala	12.54	22.32	26.56	66.32	21.86	17.74	70.40	55.29	63.34	29.70	29.29	23.54	1.82	9.82
Fathergarh Sahib	9.64	30.15	33.84	78.25	--	--	76.86	65.83	71.71	28.82	33.66	24.29	1.72	11.70
Punjab	12.28	28.31	31.89	69.26	26.47	18.25	71.70	57.91	65.16	30.07	31.44	23.82	1.32	10.95

Source: Provisional Population Totals Census of India – 2001, Punjab, Series – 4 Various Statistical Abstracts of Punjab

Punjab is relatively better placed than other states in rural infrastructure facilities, such as connectivity with pucca roads, telephone within two kilometres, percentage of cropped area irrigated, safe drinking water, primary and middle schools within the village, cent per cent rural electrification and households using electricity (Table 3).

Table 3
Rural Infrastructure in Punjab

Indicators	Rank of Punjab	State/s having better rank
Connected with pucca road	2	Kerala (1)
Bus-stop within 2 km.	7	Kerala (1), TamilNadu (2), Andhra Prudish (3), Karnataka (4), Gujarat (5) and Maharastra (6)
Primary school within village	4	West Bengal (1), Haryana (2) and Maharashtra (3)
Middle school within village	2	Karnataka (1)
Middle school within 5 km. Range	7	Kerala (1), WestBengal (2), Himachal Prudish (3), Bihar (4), NorthEast (5) and Rajasthan (6)
Railway station within 5 km.	9	Orissa (1), WestBengal (2), Bihar (3), TamilNadu (4), Gujarat (5), Kerala (6), Haryana (7) and Uttar Prudish (8)
Post office within 2 km.	6	Kerala (1), Andhra Prudish (1), TamilNadu (3), Gujarat (4) and WestBengal (5)
Telephone within 2 km.	4	Tamil Nadu (1), Kerala(2) and Gujarat (3)
Safe drinking water	3	Kerala (1) and Gujarat (2)
% cropped irrigated area	1	

Source: NCAER, *India Human Development Report, 1999.*

However, within Punjab there are disparities between rural and urban areas (1991 Census) in accessibility of basic facilities in respect of households having pucca houses (71 % for rural and 88 % for urban), toilet facilities (16 % for rural and 73 % for urban), electricity connections (77 % for rural and 99 % for urban), safe drinking water (92 % for rural and 94 % for urban) and households having access to all the three facilities taken together (13 % for rural and 68 % for urban).

Status of human development: According to the National Human Development Report 2001, Planning Commission, Government of India, 'There is today, a broad based consensus to view human development in terms of, at least, three critical dimensions of well-being. These are related to longevity – the ability to live a long and healthy life; education – the ability to read, write and acquire knowledge; and command over resources – the ability to enjoy a decent standard of living and have a socially meaningful life'. Similarly, poverty is viewed not only in terms of lack of adequate income, but as a state of deprivation spanning the social, economic and needs context of the people that prevents their effective participation as equals in the development

process. In a nutshell, human development can be gauged from indicators such as level of literacy, enrollment in schools, health facilities, poverty ratios and per capita income levels.

Despite being an economically well-off state (ranked second among Indian states for per capita net state domestic product, at 1993-94 constant prices, during 1998-99), it has lagged behind in effective human resource development, especially in rural areas. The value of the human development index (HDI) for Punjab in 1991 was 0.475 (ranked 12th among Indian states and Union Territories) -- 0.447 for rural Punjab (rank 11th) and 0.566 for urban Punjab (rank 16th). Gender Equality Index (GEI), estimated to reflect the relative attainments of women as against men, was 0.710 in value and Punjab ranked 19th among the Indian states and UTs, - a *matter of concern*. However, in the context of HPI the state ranked seventh among the Indian states and UTs in 1991, and sixth in the case of rural Punjab.

There exist wide ranges of disparities in the attainment of education, reach of health facilities and level of poverty across rural and urban areas of the state. The literacy rate was 65.16 per cent for rural Punjab during 2001 and 79.13 per cent for urban areas (a difference of 14 per cent). This situation is even worse for females, where the margin of rural-urban divide was 17 per cent. Similar was the case with the enrollment ratios within the age group 6 to 11 years, which was 63.7 per cent for rural areas as against 71.2 per cent for urban areas in 1991. In the case of upper primary school the difference between urban and rural enrollment ratios was as high as 12 per cent. The situation for girls was even worse as the difference in the enrollment ratios was 18 per cent (11 to 14 years age group). This shows the pathetic state of basic education in rural Punjab and the differentials in the attainment levels of education across boys and girls.

The situation regarding health indicators too was no different. According to the *Indian Human Development Report 1999*, rural Punjab was ranked 16th (last) among the Indian states regarding access to health sub-centres. Data obtained from the Sample Registration System (SRS) 1998 indicate that although the crude death rate (CDR) for the state had declined from 10.4 per 1,000 population in 1971 to 7.7 in 1998, the CDR in urban areas (6.3) was significantly lower than in rural areas (8.2). The infant mortality rate (IMR) in Punjab in 1998 was estimated at 54 per 1,000 live births, which was much lower than the rate of 72 for India as a whole. However, the rural IMR (58) was at a significantly higher level than the urban IMR (40). The crude birth rate for the state in 1998 was estimated at 22.4 but, while it was 18.5 for the urban areas the corresponding estimate for the rural areas turned out to be at a much higher level at 23.7. Rural women in Punjab, on an average, give birth to about 0.7 more children than urban women; the Total Fertility Rate (TFR) for rural women was estimated at 3.0 and that for urban women 2.3.

The sex ratio in Punjab, according to the Census of 2001, was one of the lowest in the country. It declined to 874 females per 1,000 males, from 882 in 1991. In rural areas too, the sex ratio was on a lower side at 887. Within rural Punjab, the district of Fatehgarh Sahib had the lowest sex ratio (859). Further, within the age group of 0-6, Punjab had seven out of ten bottom districts with the lowest sex ratio in the country. Fatehgarh Sahib district has the lowest sex ratio for this age-group (754) in the country. Within rural areas too, its district was at the lowest level. It had 747 female children against 1,000 male

children. This reflects the low status accorded to women, especially the girl child in Punjab. The widespread practice of female foeticide has further aggravated the situation. If the trend in declining sex ratio is not checked urgently, it will have long-term irreversible implications for the society as a whole.

Table 4 highlights the sub-regional disparities with respect to accessibility of some of the basic facilities in rural areas of the state.

Table 4
District-wise Selected Development Indicators in Rural Punjab-1998-99

Region/ Districts	Density of population (per sq. km.)	Cropping intensity	% of cropped area irrigated	% of Villages with water scarcity	Popn. served per medical inst.	Popn. served per primary school	Popn. served per middle school	Popn. served per High/S.S School	% of Inhabited villages linked with pucca road	Popn. served per comm ercial Bank	Popn. served per market commit tee (Squs. Kms)	Popn. served per Post Office	Rural Focal Points	Sex ratio (Rural)	
														Total Rural	0-6 age group
Majha															
Gurdaspur	438	186	99.9	30.0	4591	1031	3186	8059	100.0	16468	53.3	5549	62	895	789
Amritsar	286	191	99.4	68.5	3169	1488	4242	7830	97.7	11672	32.4	4112	70	885	789
Doaba															
Kapurthala	328	195	100.0	24.5	3041	1030	2768	6682	94.1	11888	45.5	4933	22	907	773
Jalandhar	427	174	99.8	37.2	3067	1259	3265	5816	100.0	11959	39.5	3433	38	904	806
Nawan Shehar	417	187	88.6	58.0	2663	1221	2935	5937	99.8	13594	47.6	3354	21	914	811
Hoshiarpur	361	162	67.2	66.1	6112	969	3301	6019	99.0	15479	76.7	3221	44	947	813
Malwa															
Rupnagar	380	177	76.7	82.2	3120	933	3324	6215	97.2	12956	100.7	4223	28	869	787
Ludhiana	377	195	100.0	69.3	5231	1513	3076	5317	99.4	13319	48.3	4025	38	877	812
Ferozepur	249	194	99.0	74.0	3360	1254	4328	9649	89.3	18547	44.0	4907	53	893	874
Faridkot	239	192	98.3	100.0	3327	1712	2844	6783	100.0	16796	38.8	5878	10	876	805
Mukatsar	215	179	96.0	98.7	2437	2000	3170	5753	100.0	14684	86.4	4694	27	880	810
Moga	324	197	99.9	100.0	3223	2760	3322	5787	100.0	9442	30.2	3429	20	885	820
Bhatinda	259	180	95.0	100.0	3135	2580	3994	6700	100.0	15106	40.6	6247	33	868	789
Mansa	254	176	88.0	100.0	3253	2091	3819	9759	100.0	20268	43.3	5791	19	875	780
Sangrur	267	193	99.2	85.0	3529	1916	7927	6901	84.1	16514	20.9	6005	60	869	779
Patiala	338	196	98.9	78.9	4562	1146	4098	8760	99.4	16337	37.2	6792	39	862	764
Fatehgarh Sahib	341	189	100.0	35.8	3202	902	3203	6870	100.0	18895	48.1	4723	19	859	747
Punjab	330	187	94.5	58.5	3620	1331	3738	6970	97.3	14387	40.6	4524	597	887	795

Source: Statistical Abstract, Punjab-2001

Another important indicator of the status of economic as well as human development is the incidence of poverty. Table 5 gives the percentage of population below poverty line for Punjab and India, by rural and urban residence respectively, according to the various rounds of NSS. Punjab is one of the states where the poverty ratio was less than ten per cent in 1999-2000. Estimated at 6.16 per cent in 1999-2000, it was the lowest among the Indian states. However, here too the ratio was less favourable in rural than in urban areas. (See Table 5)

Table 5
Poverty Ratios in Punjab and India

Year/State	Area	Punjab	India
1999-2000	Rural	6.35	27.09
	Urban	5.75	23.62
	Total	6.16	26.10
1993-94	Rural	11.95	37.27
	Urban	11.33	32.36
	Total	11.77	35.97
1987-88	Rural	12.60	39.06
	Urban	12.91	40.12
	Total	12.70	39.34
1983	Rural	13.20	45.61
	Urban	23.86	42.15
	Total	16.29	44.76
1977-78	Rural	16.37	53.07
	Urban	27.64	47.40
	Total	19.36	51.81

Source: 1 *Report of the Expert Group on Estimation of Proportion and Number of Poor*, Perspective Planning Division, Planning Commission, Government of India, New Delhi, July 1993

2 Planning Commission, Government of India.

In the present policy environment of LPG, agriculture and rural development are now poised for a paradigm shift. The core factors that can bring forth a tangible transformation are the following:

- a) Reduction of rural-urban disparities in terms of economic development, employment and infrastructure.
- b) Development of industry in rural areas related to agricultural development, cottage industry and allied sectors.
- c) All-round skill upgradation through research and extension and information technology, so that rural people can design means for the improvement of their own links own betterment.
- d) Minimizing social differences through collective participation in rural developmental activities; developing common programmes for village improvement and to make combined efforts for eliminating or minimizing gender disparities and social evils within rural society, through the decentralized Panchayati Raj System.

To meet the incoming challenges, the above-mentioned points assume greater significance today. It is now expected that the transformation can be hastened through the effective implementation of the Panchayati Raj System, which has the constitutional authority to plan and implement programmes for rural development.

RURAL DEVELOPMENT AND PANCHAYATI RAJ INSTITUTIONS

Panchayats have been in existence since time immemorial. In the ancient period, They generally functioned as informal institutions to solve intra-village and sometimes inter-village feuds, and as organized for a for village-level social developmental and cultural activities. In the medieval period casteism and the feudal system of governance slowly eroded self-governance in the village. During the British regime '... the autonomy of Panchayats gradually disappeared with the establishment of local civil and criminal courts, revenue and police organizations, the increase in communications, the growth of individualism and the operation of the individual's *Ryotwari System*' (*Royal Commission Report on Decentralization 1907*).

In the case of Punjab, village panchayats were first set up formally after the passage of the Punjab Village Panchayat Act in 1912 under the Mantagu-Chelmsford Scheme. The Punjab Village Panchayat Act, 1921 replaced the earlier legislation. It was further followed by the Village Panchayats Act, 1939, on the initiative of the then Development Minister, Chaudhary Chottu Ram of the Unionist Party Government. At the same time, the other rural-level institution operating was the district board. There were functional links between the Panchayats and the district boards limited mostly to the improvement and expansion of rural works and some civic works.

After independence, the Indian Constitution placed the Panchayati Raj System under the Directive Principles of State Policy. In Punjab, both the institutions, namely Village Panchayats and District Board, were sought to be democratized and re-empowered through a new Act The Punjab Gram Panchayat Act, 1952. It provided for the constitution of village panchayats on a mandatory basis through universal adult franchise. The Punjab government decided to reorganize its Panchayati Raj System in 1961 on the basis of the Balwantray Mehta Committee recommendations. New additions were made for the adoption of the three-tier pattern in the Punjab Panchayat Act, with the introduction of the Panchayat Samitis and Zila Parishads Act, 1961. The new three-tier system, comprising Gram Panchayat at the village level, Panchayat Samiti at the block and Zila Parishad at the district level, became operative from 1962-63. The existing district boards were abolished. The Panchayat Samitis and Zila Parishads functioned as representative bodies upto 1970 and again from 1975 to 1978. (In the intervening period from 1970-1975, these had been dissolved). Thereafter, these two tiers remained with government officials till 1994. Elections to the Gram Panchayats (first tier) were held regularly (1952,1957, 1962,1968,1973,1978,1983,1992 and 1998) since independence, with the exception of 1988 due to the turbulent situation in the state. With the passing of the 73rd Constitutional Amendment Act, 1992, the state government enacted a new panchayat Act, The Punjab Panchayati Raj Act, 1994, which came into force in place of the Gram Panchayat Act, 1952, on 21 April 1994. New rules were framed under the provisions of this new Act and the first elections to 138 Panchayat Samitis and 14 Zila Parishads were held in 1994, and 2,441 Samiti members and 274 Zila Parishad members were elected. The village Panchayat elections were held in June

1998. Recently, elections to Panchayat Samitis and Zila Parishads (which were due in 1999) were held in June 2002, for which 2,485 members of Samitis and 281 members of Zila Parishads were elected by the members of the Gram Sabhas for 140 Samitis and 17 Zila Parishads respectively (Tables 6, 7 and 8).

Table 6
Trends in Number of Gram Panchayats in Punjab (1968-1998)

Region/District	1968	1973	1978	1983	1992	1998
Majha						
Gurdaspur	870	1056	1246	1335	1451	1589
Amritsar	1009	1045	1080	1088	1164	1268
Doaba						
Kapurthala	236	340	427	449	490	533
Jalandhar	833	878	1055	1084	1113	886
Hoshiarpur	835	1035	1294	1350	1432	1314
Nawan Shahr	--	--	--	--	--	440
Malwa						
Rupnagar	611	629	716	757	805	856
Ludhiana	805	824	877	884	840	871
Ferozepur	658	756	907	931	1036	1202
Faridkot	536	542	552	552	581	180
Bhatinda	481	510	516	516	278	303
Sangrur	574	657	683	685	703	727
Patiala	970	1059	1258	1318	1035	1063
Mansa	--	--	--	--	241	243
Fatehgarh Sahib	--	--	--	--	428	438
Moga	--	--	--	--	--	191
Muktsar	--	--	--	--	--	265
Total	8418	9331	10611	10949	11597	12369

Source: Department of Panchayats and Rural Development, Punjab

Table 7
Total Members of Elected Representatives (Panches and Sarpanches) of Gram Panchayats during 1968-1998

Region/District	1968	1973	1978	1983	1992	1998
Majha						
Gurdaspur	4942	5963	7746	7683	10748	10677
Amritsar	6638	6985	8234	7176	8951	9328
Doaba						
Kapurthala	1431	2092	2918	3440	3032	3554
Jalandhar	5159	5988	7602	7049	8211	6229
Hoshiarpur	5106	5576	7191	7224	10696	8705
Nawan Shahr	--	--	--	--	---	3103
Malwa						
Rupnagar	3195	3415	4948	5978	6380	5676
Ludhiana	4676	4780	6327	5167	6428	6540
Ferozepur	4371	5082	5848	6250	6342	8341
Fridkot	3581	3748	4417	4339	4806	1418
Bhatinda	3055	3380	3893	4392	2407	2589
Sangrur	3807	3833	5226	5239	4932	6067
Patiala	5728	6424	9060	9078	7366	7001
Mansa	--	--	--	--	2005	2013
Fatehgarh Sahib	--	--	--	--	2807	2754
Moga	--	--	--	--	---	1690
Muktsar	--	--	--	--	--	2157
Total	51689	57266	73410	73015	85111	87842

Source: Department of Panchayats and Rural Development, Punjab

The 73rd Constitutional Amendment Act, 1992 has given the mandate to establish a three-tier structure (Gram Panchayat, Panchayat Samiti and Zila Parishad) of the Panchayati Raj Institutions, enabling them to assume the role of self-governing institutions at micro-levels of administration for decentralized planning and management. The emphasis was on constituting a Gram Sabha for each village for exercising powers and performing the functions provided in the 11th Schedule under Section 243G. It provided an institution for the association of lakhs and lakhs of rural voters, both men and women, in the governance by managing local affairs in a more meaningful and appropriate manner conforming to local wishes and aspirations. This constitutional status of the PRIs has also empowered women and Scheduled Castes in the capacity of chairpersons by providing reservation for participating in the decision making process. Further 29 subjects have been exclusively transferred to the PRIs for micro-planning and implementation, for economic development with social justice.

Table 8
Total Number of Scheduled Caste and Women Sarpanches during 1978-1998

Region/ District	Scheduled Castes			Women						
	1978	1983	1992	1998	1978	1983	1992	1998		
								GEN	SC	Total
Majha										
Gurdaspur	124	100	92	266	27	19	30	396	130	526
Amritsar	44	32	32	278	26	--	1	278	139	417
Doaba										
Kapurthala	59	49	67	111	11	6	7	122	61	183
Jalandhar	257	217	45	252	25	4	3	163	136	299
Hoshiarpur	186	202	201	313	17	13	21	286	151	437
Nawan Shahr	--	--	--	112	--	--	--	92	55	147
Malwa										
Rupnagar	65	51	20	143	18	4	4	206	68	274
Ludhiana	46	41	49	206	12	6	3	186	103	289
Ferozepur	21	16	25	166	12	6	11	320	86	406
Fridkot	8	9	14	45	13	4	12	36	23	59
Bhatinda	16	7	7	62	9	7	4	67	36	103
Sangrur	31	13	29	140	1	2	8	170	72	242
Patiala	104	37	58	153	16	8	11	281	76	357
Mansa	--	--	8	51	--	--	1	5	25	79
Fatehgarh Sahib	--	--	24	90	--	--	5	103	42	145
Moga	--	--	--	42	--	--	--	41	22	63
Muktsar	--	--	--	69	--	--	--	53	35	88
Total	961	774	671	2499	197	79	121	2854	1260	4114

Source: Department of Rural Development and Panchayat, Punjab

It is imperative to increase and upgrade their knowledge, administrative and technical skills, leadership qualities and governance capabilities, through massive education, research and training for planning and implementation of the 29 subjects mentioned in the Eleventh Schedule, to ensure the effective performance of functions and powers by the representatives of PRIs. These subjects could further be clubbed into five clusters, viz., agriculture and allied activities, rural industrialization, infrastructure development, human development and social welfare and gender development (Annexure I). Once these elected representatives are converted into more effective human resources, they

will automatically become trainers for the members of the Gram Sabha (co-rulers in rural governance). This will enable every rural adult to be converted into a valuable human resource, capable of contributing to rural development and its sustenance. A well designed training programme has the capacity to reinforce the concept of integrated development, by giving the right direction to the otherwise disjointed development approaches, through inbuilt co-ordination between the state, PRIs and all stakeholders. It can also secure the horizontal as well as vertical co-ordination among a large number of local bodies functioning side by side.

Adequate research has not been conducted to develop an alternative model for sustainable development of rural Punjab. Though Punjab Agricultural University has succeeded in developing the agriculture and allied sectors, it has not yet evolved an integrated/holistic model for rural development. For this, there is need to set up a minimum of four zonal centres (one each in Majha and Doaba cultural zones and two in Malwa Zone) for conducting research on issues and problems of rural society and suggest viable solutions for policy planning. These centres should impart training and education to the representatives of local governance (PRIs), co-operatives, mahila mandals, youth clubs and other stakeholders, if any, about their roles and responsibilities, and also promote appropriate rural technologies and skills for human development. So far, Punjab has lagged behind in skill upgradation of its human resources. What is needed now is a long-term policy for development of human resources, through education, training, empowerment of PRIs and the creation of a congenial socio-economic, institutional and political environment. Human resources are inexhaustible and renewable, and these are the only resources which can sustain development for a longer period. Human beings are both the end and the means of development. The proposed centers, as suggested above would help to fulfill the aforesaid objectives*.

The experience of CRRID in conducting the training and education programme for the representatives of PRIs has reinforced its importance, especially in areas which affect the pace of rural development. So far, CRRID has successfully conducted four state-level conferences, four district-level conferences and 126 block-level workshops in 11 districts of the state, at which 11,493 representatives of PRIs (Table 9) were educated about their roles and responsibilities provided in the Punjab Panchayati Raj Act, 1994, encompassing broad aspects of rural development (listed in the 11th Schedule). The consequent assessment and evaluation of the training and education programme indicated the need for continuation of training to facilitate sustainable rural development.

* It may be mentioned here that Punjab has a State Institute of Rural Development (SIRD) at Nabha and a Community Development Centre at Batala, which cater mainly to the training needs of government functionaries. These are grossly inadequate to meet the requirements of training of elected representatives of PRIs.

Table 9
Number of Training Workshops for the Representatives of Panchayat/ Raj Institutions
Conducted by CRRID

Sr. No.	Year	Number of workshops/ conference	Level	Number of participants*
1	1994	1	State	95
2	1995	15	Block	1912
3	1996	14	Block	2815
4	1997	13	Block	2473
5	1998	3	Block	105
6	1999 @	9	Block	315
7	2000	1	State	65
8	2000	3	Block	111
9	2001	2	State	436
10	2001	4	District	496
11	2001	48	Block	1795
12	2002 (upto 14 th August)	21	Block	875
Total		134	All	11493

Note: * Participants comprised of representatives of Panchayati Raj Institutions including members of all the three tiers. Due representation was given to women and SC members in the workshops/conferences.

@ From 1999 to 2001, the participants were mainly from the Gram Panchayats, as elections to the other two Panchayat bodies were held in 2002.

At present there are 87,842 members of Gram Panchayats, 2,485 members of Panchayat Samitis and 281 members of Zila Parishads. It is estimated that a sum of Rs. 11 crores would be needed for carrying out a one-time training programme to enhance their capacity-building through their training and education, (Table 10). It is also necessary to build-in a reorientation-training programme, for which a separate budget should be worked out every year.

Table 10
Action Plan for Education, Training and Empowerment of the Elected Representatives of PRIs

Particulars	Number of PRIs	Total No. of elected representatives	Proposed No. of training workshops	Expenditure per participant* (In Rs.)	Total Expenditure required (in Rs.)
Gram Panchayats	12369	87842	1757	1200	10,54,10,400.00
Panchayat Samitis	140	2485	140	1500	37,27,500.00
Zila Parishads	17	281	17	2000	5,62,00.00
Total	12526	90568	1914		10,97,00,300.00

Note: *Based on CRRID'S Two Day Block Level Training Programmes for representative of PRIs

The new orientation requires attitudinal change to develop a vast base of human resource. At the present stage, when PRIs have yet to take firm root, it is important that they win the acceptability and confidence of the people through efficient implementation of development programmes, rather than be perceived as organs of state power. Furthermore, the Eleventh Schedule covers all the three levels of Panchayats and there

is an apparent overlap of functions. Therefore, demarcation of operational responsibility between one level of Panchayats and another has to be made specifically with reference to each programme or activity. The number of plan schemes, as mentioned in the said document, literally runs into hundreds. Each of them has to be examined to see what the state government should retain and what should be entrusted to the district/intermediate/Gram Panchayats. Such demarcation cannot first be a one-time exercise, and will require periodical dissemination of information, education and training.

Preparation of multilevel integrated village plans, together with budget estimates, is another essential prerequisite for Panchayati Raj Institutions. Article 243 G has made it clear that the primary role of the Panchayats will be in the area of development, planning and implementation of programmes of economic development with social justice.

There is immediate need to study the potential of rural industrialization for creation of employment opportunities in rural areas, in the context of the 73rd Amendment Act, 1992. The demand for encouraging the setting up of rural industrial enterprises is going to be generated with the mandate to plan as well as implement the work-plan on the subjects transferred to the PRIs. A close look at the 29 subjects provides a clear picture of the potentials of setting up all types of industries in rural areas. This is high time that the state government should consider it seriously.

The time is also ripe for the state government to have a dialogue with such international organizations as the International Labour Organisation (ILO) and the corporate sector/industrial houses to work out operational plans for capacity building on the one hand, and evolve clearly-designed operational strategies for promoting enterprises for the manufacture of products, demands for which are going to be generated by the decentralized activities in the context of the 73rd Amendment on the other. The operational strategy is sure to get the support of the Government of India in view of its pronouncement to have a National Programme for Rural Industrialization (NPRI), proposing to set up 100 rural clusters every year to give a boost to rural industrialization. It is being done for the benefit of artisans and unemployed youth. It is perceived to reduce rural-urban disparities. It will also go a long way in the marketing of rural industrial products.

Moreover, the objectives of the Panchayati Raj system could be revitalized by transferring funds, functions and functionaries, as provided in the 73rd Constitutional Amendment Act, 1992 and Punjab Panchayati Raj Act, 1994. In the changed situation, PRIs will have to be viewed as institutions of local self-government, not as implementing agencies for Centre and State Government Programmes, but as institutions to prepare micro-plans and also to implement them. Active participation of women and Scheduled Caste representatives has to be ensured in decision making for building, promoting and empowering the new leadership of women and Scheduled Castes. For this, Panchayati Raj Institutions will have to be strengthened. Strengthened PRIs will demand a understanding of their role, systems of governance, accountability, transparency and interlinkages. Comparative state-wise studies of PRIs, carried out by the National Institute of Rural Development, Hyderabad, have clearly brought out the differences in governance of PRIs where powers and responsibilities have been transferred and where these have not been transferred.

The First Punjab Finance Commission, in its recommendations, stressed the devolution of funds from the state government to PRIs for improving their financial position. The

state government had accepted for implementation, with effect from 1 January 1997, the recommendation for transferring 20 per cent of the net proceeds of five taxes: stamp duty, Punjab motor vehicles tax, electricity duty, entertainment tax and entertainment cinematograph shows tax. Other recommendations of the Finance Commission have been sent to the departments concerned for comments. According to the recommendation of the First Finance Commission, the 20 per cent share of the receipts of these five taxes, amounting to Rs. 607.29 crore over the five years 1996-97 to 2000-01, was to be transferred to PRIs and ULBs (Table 11).

Table 11
Amount to be Transferred to PRIs/ULBs from Five Divisible State Taxes and Amount Actually Given
(in Rs. crore)

Year	Receipt from divisible taxes	Cost of collection	Net receipt	20% share net	Original budget outlay for PRIs	Amount Transferred to PRIs	Short fall of PRIs	Original budget outlay for ULBs	Amount Transferred to ULBs	Short-fall of ULBs
	1	2	3 (1-2)	4	5	6	7 (5-6)	8	9	10 (8-9)
1996-97	450.54	5.15	445.39	89.07	-	-	-	11.89	-	11.89
1997-98	476.59	6.03	470.56	94.11	55.77	26.92	28.85	50.97	36.26	14.71
1998-99	542.21	12.81	529.40	105.88	59.47	8.53	50.94	45.57	10.82	34.75
1999-00	701.26	11.36	689.90	137.98	63.37	31.48	31.89	40.00	13.18	26.82
2000-01	912.63	11.42	901.20	180.24	54.00	14.70	39.30	32.22	17.78	14.44
Total	3083.23	46.77	3036.45	607.29	232.61	81.63	150.98	180.65	78.04	102.61

Source: (i) Department of Finance, Punjab
(ii) *Annual Plan Documents* 1997-98 to 2001-2002
(iii) Department of Local Government Punjab

'The funds, which were due to PRIs as their share of divisible taxes but have not been transferred to them, would have made considerable difference to their financial position' (*Second Punjab Financial Commission Report*). Even the provision for the transfer of share of the divisible tax as budgeted has not been in accordance with the recommendations of First Finance Commission. The share of PRIs becomes Rs.607.29 crore \times 232.61/413.26 = Rs. 341.55 crore, but the original budget outlay was Rs. 232.61 crore resulting in an amount of Rs. 150.98 crore from the budget outlay (actual Rs. 259.92 crore) not being given to PRIs.

For strengthening the Panchayati Raj System and its institutions the state must take initiatives on: transfer of functions, finances and functionaries to the Panchayati Raj Institutions; empowerment of the Gram Sabha; replacement of the District Development Planning Boards by District Planning Committees; integration of development funds allotted to MPs with the funds of Zila Parishads; decision of the state government on the recommendations of the State Finance Commissions within a specified period; ensuring training of all newly elected representatives within a year of their election and organizing refresher courses periodically.

The ongoing programme of training and empowerment of representatives of PRIs being organized by CRRID in Punjab, and sponsored by UNICEF, has brought out clearly the significance of such training programmes. Participants have been unanimous that these should be at the local level and within a year immediately after the elections. Women and Scheduled Castes representatives, in particular, stressed the need for these training programmes. In general, the participants opined that such training programmes, as conducted by CRRID, would considerably help elected representatives to understand the process of decentralized planning and devolution of powers to PRIs through transfer of funds, functions and functionaries. It is apparent from the above observations that

unless these powers are fully devolved, the PRIs will not be able to perform their duties, especially in village planning.

Skill upgradation--an indigenous approach: Mahatma Gandhi had been a champion of rural self-sufficiency in resource utilization, governance and other aspects for the welfare of the rural community. He also emphasized the concept of Nai Talim (basic education), aimed at educating the rural youth for solving rural problems. The idea of rural institutes has been finding place in the recommendations of various education commissions starting from Dr. Radhakrishnan Commission of 1949. Subsequent to this a rural-based agricultural university was set up at Pant Nagar in Uttar Pradesh in 1960 and the second university in 1962 at Ludhiana. When India was passing through a phase of grain shortage, the entire attention of the agricultural universities was on research, development and extension of agriculture. In the process, rural development programmes, a task originally meant for State Agriculture Universities (SAUs) were lost sight of.

In view of the Constitutional Amendment Act, 1992, the time has come when rural development programmes and activities must take a front seat. It is in this context that the National Council of Rural Institutes (NCRI) has started considering introduction of rural higher education programmes, primarily based on the Nai Talim concept, in accordance with local needs and requirements of the people who have not so far been incorporated in mainstream higher education, covering directly dimensions of research, teaching, extension and networking. It is with the introduction of this type of a rural education programme that the Panchayati Raj System will get the needed strength for understanding and resolving local rural problems. The ultimate goal is the development of able and responsible human beings, fully competent to organize and eventually lead a profession to new heights of accomplishment in the service of the society.

Most of our learning in the higher institutes is based upon hypotheses, concepts and theories evolved by western scholars including rural sociologists, which has limited application to our rural development. Rural problems of Punjab, as for that matter every state of the Indian Union, are different and unlike the West whose concepts and theories have been applied in the past for the developmental processes. In the context of rural development, indigenization of concepts and theories are essential for understanding and resolving the issues that confront state governments, Panchayati Raj Institutions and stakeholders. This calls for Indianization of social science research, particularly relating to rural areas. Such an approach, if adopted in social science research, is likely to provide solutions to problems of bringing about rural transformation at a faster pace.

Punjab's rural society has its own identity and psyche, traditions, culture and heritage. Therefore, these must be considered a part of overall rural developmental strategies, with emphasis on the explicit recognition of Punjabi identity. The social factors dominant in the Punjabi style of living and working, when compared with Indian standards, are qualitatively better in some respects (Table 3). While much reform is needed to speed up rural transformation in Punjab, some of the areas that need immediate attention are given below.

RURAL NON-FARM SECTOR

The contribution of Punjab to India's net domestic product (NDP) in 1999-2000 (at current prices) was estimated at 3.45 per cent. According to the 2001 Census, while nearly three-fourths of India's population lived in rural areas, in Punjab this was around two-

thirds. Further while two-fifths of the state's NDP came from its agriculture and allied sector, for the rest of the country it was less than one-third. The rural-urban divide in income distribution in Punjab was not as pronounced as at the all-India level. The Census also highlights the dominant role that agriculture continues to play in Punjab in shaping the level of living of its people (Table 12).

Table 12

Sector-wise Share of Punjab in Net Domestic Product of India by Economic Activity (1999-2000) at Current Prices (Rs. in crore)

Economic Activity	India	Punjab	Share of Punjab
Primary	489019	23352.05	4.78
Secondary	343467	12411.70	3.58
Tertiary	770246	19706.37	2.56
Total	1605732	55470.12	3.45

Source: *Statistical Abstract of India-2000*
Statistical Abstract of Punjab-2001

In Punjab, while the share of the primary sector in the net state domestic product has come down from 49.13 per cent in 1980-81 to 38.66 per cent in 2000-01 (at 1993-94 constant prices), for the secondary sector it has increased from 20.01 per cent to 24.9 per cent and that of the tertiary sector from 30.86 per cent to 36.44 per cent. (for details see Table 13)

The rural non-farm sector, with its forward and backward linkages, is an integral part of overall rural development, which has not yet received due attention in Punjab. Table 14 gives the percentage shift of rural non-farm employment and shares of the secondary and tertiary sectors in Punjab. It is evident that there has been a sharp decline in the share of employment under household industry from 9.96 per cent of the total workforce in 1981 to 4.53 per cent in 1991. Similarly, under the non-household industry group it has marginally declined to 21.25 per cent in 1991 from 22.29 per cent in 1981. On the other hand, the share of employment in construction has increased from 6.80 per cent in 1981 to 7.25 per cent in 1991. A significant increase was also found in the category 'other services', from 33.33 per cent to 41.11 per cent during this period. For district-wise details see Annex II.

Table 13

Percentage Distribution of Net State Domestic Product at Factor Cost

Sectors	1980-81*	1990-91*	2000-01**(Q)
Agriculture	33.76	31.25	25.90
Livestock	14.44	15.23	12.26
Sub-total Primary	49.13	47.13	38.66
Registered manufacturing	6.70	10.13	10.78
Unregistered manufacturing	4.96	6.70	5.21
Construction	5.71	3.25	6.25
Electricity & water supply	2.64	3.80	2.66
Sub-total Secondary	20.01	24.38	24.90
Transport, communication and storage	2.61	3.12	5.15
Trade, hotel and restaurants	13.10	10.39	12.59
Banking and insurance	2.30	4.07	5.44
Real estate and ownership of dwelling	4.77	3.50	4.15
Public administration	2.85	3.35	5.05
Other services	5.30	4.06	4.06
Sub-total Tertiary	30.86	28.49	36.44
Grand Total	100	100	100

Source: *Statistical Abstract of Punjab* various issues

Note : Quick estimates

* - at 1980-81 constant prices

** - at 1993-94 constant prices

Table 14
Percentage Shift of Rural Non-farm Employment and Shares of Secondary and Tertiary Sectors in Punjab during 1981 and 1991

	1981	1991
Household industry	9.96	4.53
Non-household industry	22.29	21.25
Construction	6.80	7.25
Trade & commerce	17.41	16.79
Transport, storage & communications	10.16	9.97
Other services	33.33	41.11

Source: Director of Census Operation Punjab, *Census of India 1981, 1991*.

Table 15
Percentage Distribution of Workers by Category--Punjab 1981-2001

Total/ rural urban	Person/ male females	Percentage Distribution of Total Workers											
		Cultivators			Agriculture labourers			Workers in household industry			Other workers		
		1981	1991	2001	1981	1991	2001	1981	1991	2001	1981	1991	2001
Total	Persons	35.9	31.4	23.0	22.2	23.8	16.4	2.6	1.3	3.4	39.4	43.4	57.3
	Males	37.0	32.5	26.0	22.1	23.8	15.9	2.5	1.3	2.3	38.5	42.5	35.8
	Females	5.9	8.7	13.0	25.3	24.4	17.9	4.9	3.2	7.0	64.0	63.8	62.0
Rural	Persons	47.7	42.8	31.5	28.5	30.8	22.0	2.3	1.2	3.1	21.5	25.3	43.4
	Males	48.8	43.8	37.6	28.1	30.4	22.5	2.2	1.1	1.8	20.9	24.8	38.2
	Females	9.7	15.0	15.4	42.6	41.5	20.8	5.7	3.4	6.7	42.0	40.1	57.1
Urban	Persons	5.1	4.2	3.2	5.7	7.2	3.4	3.4	1.7	3.9	85.5	86.5	89.5
	Males	5.3	4.4	3.4	5.8	7.5	3.3	3.4	1.6	3.2	85.5	86.5	90.1
	Females	1.2	1.1	1.8	4.1	3.6	4.3	3.8	2.9	8.5	90.9	92.5	85.4

Source: *Census of India-2001*

The data in Table 14 throw light on the state of the ongoing non-farm activities in Punjab. The share of employment in the manufacturing sector (household and non-household industry) is declining and increasing in the services sector. Within the service sector, however, trade and commerce and transport, storage and communication, which should have been growing and employing more persons, have been showing a downward trend in the share of total employment. Adequate provision of these services would have given fillip to the manufacturing sector as well.

Table 15 gives the percentage distribution of workers by categories for rural and urban Punjab from 1981 to 2001. Only 3.1 per cent of the rural workforce has been engaged in the household industry. The percentage share of 'other workers' in rural areas has increased from 21.5 per cent in 1981 to 43.4 per cent in 2001, whereas that of other workers in urban areas has increased marginally from 85.8 per cent to 89.5 per cent during the corresponding period. 'Other workers' mainly include government servants, teachers, plantation workers, those engaged in trade, commerce, business, transport, storage, banking, construction, political or social work, priests, entertainment, artists, etc.

Out-migration of the rural population in search of jobs has not only resulted in over-burdening urban resources but has also forced the labourforce (displaced from the rural economy) to live in slum-like situations in urban centres. It is necessary to create better socially acceptable employment opportunities by developing the non-farm sector in rural areas, to stop the migration of the rural unemployed to urban areas. For this, minimum basic facilities, such as availability of safe drinking water, proper sanitation and sewerage, better rural health and education and community social assets, wherever existing, have to be utilized effectively and developed where non-existent. The need is to mobilize and involve the community for the proper maintenance of the facilities available at the local level, preferably under Panchayat Raj Institutions.

The corporate sector can play a major role by bringing resources, new technology, modern management and extension services to the local people, which can facilitate provision of employment opportunities for the rural unemployed in secondary and tertiary sectors, by training them for the required jobs. For example, agriculture in Punjab is already over-capitalized in the case of farm machinery, usages of fertilizers and pesticides. Local people could be trained for maintenance and repair services, input delivery services by acting as servicing agents, as Mahindra Shubh Labh Services Limited have done in Tamil Nadu and Rajasthan, which has helped both agriculturists (by increasing farm production) and non-agriculturists (by providing employment in non-agriculture sectors). In short, the service sector for agriculture can be developed profitably by the corporate sector.

RURAL INFRASTRUCTURE DEVELOPMENT

Punjab has set up the Punjab Infrastructure Development Board (PIDB), Punjab State Agriculture Marketing Board (PSAMB) and Punjab Agro-Industry Corporation (PAIC) for the development of infrastructure in the state, for the construction and repair of roads, bridges and national highways including village and town roads, regulated markets, sub-market yards, purchase centres, development of food parks having the facilities of research and development centres, procurement centres, cold-storage space, transportation hub, facilities for sorting, grading and quality assurance, food processing centres and other facilities.

Punjab contributes 45 per cent of rice and 65 per cent of wheat to the central pool. Punjab State Agricultural Marketing Board operates through its 144 market committees for procurement of foodgrains. In addition, 207 sub-market yards and 1,191 purchase centres are opened during the wheat and paddy seasons. Market committees are service-rendering agencies and their main source of income is the market fee. The existing rate of market fee has been fixed at two per cent on an advalorem basis for all purchase /sale transactions of agricultural produce. In addition, the Rural Development Board also levies two per cent Rural Development Fund (RDF) on the purchase/sale of agricultural produce under the Rural Development Fund Act. The market committees have been made the collecting agencies for both the market fee and RDF. RDF is to be used for the construction/repair of village link roads and the development of villages.

Table 16
Arrivals of Wheat and Paddy (in lakh tonnes)

Crop/ Year	1997-98	1998-99	1999-2000	2000-2001	2001-2002 (upto Feb. 2002)
Paddy	98.54	96.19	111.33	119.55	119.55
Wheat	65.07	79.56	79.56	97.23	105.91

Source: Punjab State Agricultural Marketing Board, Chandigarh

Table 17
Collection of Market Fee during Last Five Years (Rs. in Crore)

S. No.	Year	Total market fee
1	1997-98	174.60
2	1998-99	175.74
3	1999-00	231.42
4	2000-01	270.20
5	1.4.2001—28.2.2002	293.02

Source: Punjab State Agricultural Marketing Board, Chandigarh

Despite these Boards and Corporations and an agriculturally developed economy, the state has lagged behind in building up required infrastructure facilities, such as storages, cold chains, food parks, agro-based industries, grading and quality assurance, marketing intelligence network and dissemination of information in rural areas.

As agriculture is the mainstay of the rural economy of Punjab, there is urgent need to set up infrastructure suitable for facilitating the backward and forward linkages to agriculture. Chinese experiences show that 'Communes' have played very important role in rural social transformation through the social process of rural institutional change, accompanied by technical changes as well. Not only did they help in agricultural development but also dramatically reduced rural poverty from about one-third of the rural population in 1978 to about eight per cent in 1996. This is explained by rapid, broad-based rural development, encompassing farm as well as non-farm sectors (ESCAP, UNITED NATIONS, 1996).

Strategically, it is necessary to provide basic civic amenities to the rural population, which has been deficient since long. The state government now intends to adopt an approach of integrated development of rural areas by providing various basic facilities simultaneously, as indicated below:

- (a) Integrated water supply and sewerage disposal system.
- (b) Hundred per cent brick pavement of village streets with mechanized prefabricated bricks, with due attention to disposal of storm water.
- (c) Setting up bio-gas plants for disposal of sullage, water/generation of gas for household consumption and generation of electricity.
- (d) Provision of electricity through solar photo-voltaic and windmills in an integrated grid system manner.
- (e) Provision of street lighting, 24 hours electricity supply.
- (f) Setting up parks in rural areas with special emphasis on cleaning.
- (g) Vermiculture composting.

This requires the integration of various schemes under implementation by the Government of India as well as the state government, to ensure funding of development in a consolidated manner. The need is to strengthen decentralized, well-governed local institutions working at the village level, which have the potential for mobilizing and allocating local resources in enterprises for effective rural industrialization.

RURAL GROWTH CENTRES

Strategically, the state has had provision for the Focal Point Scheme since 1978. The objectives of this scheme are to provide full and gainful employment in the rural areas; increase agriculture production and its handling by providing marketing facilities through purchase centres; revive traditional industries to facilitate development of cottage and small-scale agro-based industries; develop and utilize local resources and ensure participation of weaker sections in the development process. There is provision for hospital, bank branch, post office branch, telephone exchange, agro-service centre, marketing yard, repair workshops, extension services of various departments, supply of petrol, diesel and cooking gas and village industries in each of the focal points. Although there are 597 rural focal points in Punjab, the desired results of providing full employment, reviving village industries, utilizing local resources and ensuring participation of weaker sections in the development process have not been very much

rewarding. This is mostly attributed to wrong selection of sites of many focal points, as these are away from natural growth centres and in some focal points, only partial services have been provided. In many focal points constructed buildings remain unutilized and under-utilized. Proper maintenance of these public utility buildings is lacking. Before starting any such big project, the government should carry out feasibility studies by conducting surveys and holding discussions with the stakeholders.

FOOD AND AGRO-INDUSTRY LINKED MARKETING SERVICES

Development of agro-based industries has a significant role in rural development, especially in an agrarian economy such as Punjab's. These industries not only provide input services but also gainful employment opportunities to rural people. Agro-processing basically involves value addition to farm produce. Presently Punjab is mainly involved in primary processing activities, such as rice milling, flour milling, sugar milling, cotton ginning, milk processing and cattle-feed making. Current agro-processing activities are based on the crops produced in the state, which have very limited scope for secondary processing. However, there are some secondary processing units engaged in the production of bread and biscuits, juice and jam, wood and paper in the private sector. There are 22 sugar mills, 2,042 rice shellers, 60 spinning mills and 46 milk plants in Punjab. Processing of fruits and vegetables is extremely low, despite the availability of a large quantity of raw materials.

In the past, almost one-fourth of the horticulture and vegetables were lost through wastage and spoilage, because of inadequate arrangements for cold storage transport and dehydration. Efforts of some private units to establish fruit- and vegetable-processing units could not succeed because of lack of facilities such as good roads, regular power supply, and the license-quota system, poor information networking, shortage of technical labour and supply of quality raw material.

Given the present structure of crop production, some important technologies for small and cottage processing units are: mini rice mills, mini grain mills, mini dal mills, mini wheat mills. It provides atta, suji, maida and grain, which can further be used for value addition in bigger units.

According to basic *Animal Husbandry Statistics*, 1999, Government of India, AHS series - 7, Punjab produces 77.74 lakh tonnes of milk, which is 11 per cent of the total milk production of the country (712.71 lakh tonnes). In this era of global trade as Punjab is number one in India in per capita availability and productivity of milk, second in milk production and 13th in milch animal population, the state has the potential to enter global trade by promoting its dairy sector. Unfortunately, the performance of our dairy sector is poor as compared to developed countries in terms of productivity, cost effectiveness and milk quality. We could go up to 1,800 litres per lactation of buffaloes and 3,000 litres per lactation of cross-breed cows. In the case of cows, Punjab has the potential to increase the average lactation milk production to 10,000 litre per cow, which is the level prevailing in such countries as USA, Canada and Israel. The need is to improve these factors with a well-planned programme involving government, private industry and farmers, to enter the world market. Existing milk plants can play a big role in developing the milk industry. They can contribute through a better milk procurement system, quality improvements, provision of technical inputs to farmers and new product development.

The main objective of setting up the Punjab Agro-Industry Corporation was to facilitate the establishment and promotion of agro-processing units to supplement and increase incomes of farmers and to generate gainful employment. Punjab Agro-Industry Corporation (PAIC) has been in the business for the last three decades. It has so far promoted 32 projects based on Agro/food processing in Punjab. The important projects relating to the processing of farm produce, such as, fruits and vegetables are shown in Table 18.

Table 18
Major Projects Undertaken in Co-ordination with PAIC

Name of Company	Capital (Rs. in lakh)	Capacity (Mts.)	Raw material	End product
Pepsi Food Ltd.	6850	800 TPA Snack Food 20000 Units Beverage Concentrate. 12000 TPA Processed Fruit And Vegetables	Tomato, Potato, Chilly	Snack Foods, Soft Drink Concentrate, Processed Fruit and Vegetable
Nijjar Agro Foods Ltd	1949	15 TPH of Tomatoes 1.5 Lac. Ltr. Milk Per day	Tomato, Chilly, Milk	Tomato Paste, Chilly Paste, Guava concentrate, Hybrid seed, Ghee, Milk Powder, Condensed milk
Agro Dutch Industries Ltd.	2350	Original 3500 TPA Expanded 28,000 TPA	Paddy Straw Mushroom Spawn	Canned Mushrooms
Golden Agro Winery Ltd.	87.50	375 Kilo litres of wine p.a to produce 5 lac bottles of wine of 750 ml. Each.	Grapes	Wine
Himalayan Frozen Foods Ltd.	970	5400 TPA in term of raw material IQF 2 ton per hrs.	F & V	Frozen Fruit and vegetable
Gloosy Foods Limited	610	2700 TPA	F & V	Dehydration supplemented by canning and bottling lines for F & V
Green Bagh Limited	770	3000 TPA	F & V	Juice Concentrate and Paste of F & V
Pagro Foods Limited	750	11600 TPA	F & V	Frozen/Processed F & V

Source: Information provided by PAIC

One of the proposed projects of PAIC is the establishment of food parks, which would perform the functions of markets and provide strong linkages between farmers, wholesalers and processors. Food parks will have facilities for R & D centres, procurement centres, cold storage spaces, transportation hubs, food processing centres and facilities for sorting, grading and quality assurance. The corporate sector has to

come in on a large scale to promote better backward and forward linkages with farm producers, to make the PAIC dream of food park a success. Moreover, with the WTO agreement in force, the future of agriculture in Punjab lies in the efficient use of resources, quality produce, value addition and agro-processing. Diversification of Punjab's economy is further limited by its resource endowments. The limited resources, which are available within the state, are not being used judiciously and are creating environmental degradation, pollution, contamination and depletion of water, deforestation and soil degradation. Planners must take into account these bottlenecks while formulating the new strategic policy for agricultural development, through backward and forward linkages ideal for the international market.

Corporatization of the rural economy becomes more relevant in the changed globalized system, where market requirements of quality produce have to be met. The entry of the corporate sector will also help the farmers of Punjab diversify crops from wheat and rice to other crops. This can be done by providing awareness about quality inputs and their judicious use, ensuring their crop procurement, refrigeration, carrier, grading, cleaning, packing, branding and also helping in research and extension. Some of the well-known corporate sector units are experimenting with contracting the farmers of Punjab for growing potato, tomato and chillies in the districts of Sangrur, Bhatinda, Mansa, Moga, Ludhiana, Kapurthala, Hoshiarpur and Amritsar. The recent field experience of CRRID with Mahindra Subh Labh Services Limited (MSSL), Mumbai, shows that the farmers of the state are showing a keen interest to grow crops according to the requirements of the corporate sector, provided it protects the existing minimum returns and assures marketing of the produce.

RURAL POVERTY ALLEVIATION PROGRAMME

India has a long history of government intervention in the rural sector of its economy. India's development strategies have accorded high priority to agriculture and rural development. The Community Development Programme (CDP) reflected India's concern for nation-building and equity. The Intensive Agriculture Development Programme (IADP) employed the selective principle in deploying resources for achieving rapid production gains, ensuring thereby the equity concern of the CDP. Its main objective was to achieve rapid increase in agricultural production through the use of complementary inputs and services at the farm level. A number of programmes, such as the Intensive Agricultural Area Programme (IAAP), the High Yielding Varieties Programme (HYVP) and the Intensive Cattle Development Programme (ICPD) had been patterned like the IADP. The lesson learnt from these programmes was that a rising economic growth rate was no guarantee against poverty and unemployment. The growing inter-regional and inter-personal disparities that surfaced from these selective growth-oriented programmes led to a re-examination of the development strategies. As a consequence, special programmes, such as Small Farmer Development Agency (SFDA), Marginal Farmers and Agricultural Labourers Schemes (MFALS), Drought Prone Area Programme (DPAP) and Tribal Area Development Programme (TADP) were introduced for the weaker sections and the economically depressed areas in the seventies. These programmes were aimed at tackling the problems of poverty and backwardness by helping the weaker sections to increase their incomes through self-employment and wage-paid employment. A Minimum Needs Programme (MNP) was also launched, to supplement the income-increasing effect of these programmes in order

to provide civic amenities and community facilities in rural areas. In 1978-79, the principal contents of Community Area Development (CAD), DPAD, MFAL, SFDA were all integrated into a new programme, Integrated Rural Development Programme (IRDP) for providing income generating assets and self-employment opportunities to the rural poor.

A series of special employment programmes were also initiated in the seventies, namely, Rural Works Programme (RWP), Crash Scheme of Rural Employment (CSRE), Pilot Intensive Rural Employment Projects (PIREP), Employment Guarantee Schemes (EGS), Food for Work Programmes (FFWP), National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP), to address the acute unemployment situation in rural areas. The experiences of these programmes indicated the need for more concentrated efforts to tackle the problems of rural unemployment and construction of public works under the schemes. Keeping this in view, the Jawahar Rojgar Yojana (JRY) was launched in April 1989 by merging the two ongoing NREP and RLEGP into a single rural employment programme. Consequently, on 1 April 1999 the Jawahar Gram Samridhi Yojana (JGSY) was started to ensure development of rural infrastructure at the village level by restructuring the erstwhile JRY.

The Employment Assurance Scheme (EAS) was launched on 2 October 1993 to make larger and efficient use of available human resources for alleviation of poverty, reduction in inequalities and sustenance of a reasonable high pace of economic growth. Subsequently, the Jawahar Rozgar Yojana (JRY) has been merged with the EAS since 1 January 1996. It now covers all the rural blocks of the country. The scheme aims at providing assured employment of 100 days of unskilled manual work in a year to the rural poor, who are in need of employment and seek it. The second objective is the creation of economic infrastructure and community assets for sustained production and employment generation. The programme is restricted to males and females above 18 years and below 60 years of age. A maximum of two adults per family are to be provided assured employment for 100 days under the scheme.

The newly launched centrally sponsored Swarn Jayanti Gram Swayozgar Yojana (SGSY) has been revised keeping in view experiences of the strength and weaknesses of earlier self-employment programmes, viz., IRDP, Training of Rural Youth for Self-Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga Kalyan Yojana (GKY) and Million Wells Schemes (MWS), which are no longer in operation. SSGY has been started from 1 April 1999. It is a comprehensive self-employment, programme for the rural poor and is conceived as a holistic scheme of micro-enterprises covering various aspects of self-employment, viz., organization of the rural poor in Self Help Groups (SHG), capacity building, training, planning of activities clusters, infrastructure buildup, technology, credit and marketing. Thus emphasis in rural development has progressively shifted from growth to welfare and then from a responsive to an integrated approach.

Punjab had been implementing these centrally sponsored programmes since the Sixth Five Year Plan. The plan-wise actual expenditure for different five year plans is shown in Table 19.

Table 19
Rural Development under Five-Year Plans (Actual Expenditure) (Rs. in lakh)

Sub-head of development	7 th Plan (1985-90)		8 th Plan (1992-97)		9 th Plan (1997-2001)	
	Actual Exp.	% age to total Exp. on Rural Dev.	Actual Exp.	% age to total Exp. on Rural Dev.	Actual Exp.	% age to total Exp. on Rural Dev.
Community Development and Panchayats	2803.72	28.41	--	--		
IRDP	3043.45	30.84	2977.24	16.43	1572.42	6.27
National Rural Employment Programme	1667.35	16.89	--	--		
Jawahar Rojgar Yojna	--	--	1705.34	9.41	3831.01	15.28
Other Programme like employment guarantee programme, land reforms	9.30	0.09	13436.46	74.16	19664.44	78.44
Kandi watershed and area development programme	2247.00	22.77	--	--		
Integrated Rural Energy Programme	97.00	0.98	--	--		
Total Rural Development Expenditure	9867.82	100.00	18119.04	--	25067.87	100.00
Total Plan Expenditure	354716.55	--	681933.76	--	7812618.18	
Percentage of Rural Expenditure to Total Plan Expenditure	2.78	--	2.65	--	3.21	

Source: Various Statistical Abstracts of Punjab, Government of Punjab

The poverty ratio of Punjab has always been on the lower side throughout the plan periods. Currently, it is 6.16 per cent as compared to 26.1 per cent for India. The green revolution of the mid-sixties and early seventies has helped the rural poor of Punjab as the benefits from increased agricultural production have 'trickled down' to the poor, to some extent.

The target group of these centrally sponsored schemes consists of small and marginal farmers, agricultural labourers and rural artisans, including the disadvantaged sections of the society, such as the Scheduled Castes, physically handicapped and women. The financial and physical achievements of various centrally sponsored schemes during the Ninth Five Year Plan are as follows:

Swaranjayanti Gram Swarozgar Yojana (SGSY): SGSY was started on 1 April 1999. During 2001-2002 the Government of India allocated funds amounting to Rs. 440.29 lakh to Punjab on a 75:25 sharing basis. During 2001-02 (upto January, 2002), out of the total available funds of Rs. 544.43 lakh, Rs. 435.84 lakh, that is 80 per cent, has been utilized. During the same year, 169 Self Help Groups were formed. Of these 59 SHGs (including those formed in the previous year), covering 632 members, started economic activities. The total assistance, amounting to Rs. 159.49 lakh, has been provided to these groups. In addition to this, 3,819 individual swarozgaris have also been assisted and, assistance amounting to Rs. 1,143.62 lakh provided. Out of the total assisted swarozgaris, 57 per cent were SCs, 24 per cent women and one per cent disabled. For 2002-2003 the state has proposed Rs. 1,050.00 lakh for SGSY to benefit 6,500 swarozgaris. Table 20 gives details of financial and physical achievements under SGSY during the Ninth Five Year Plan (up to February 2002).

Table 20
Financial and Physical Achievement under SGSY Scheme during
Ninth Five Year Plan (upto February, 2002) (Rs. in lakh)

Item	1997-98 to 2001-02	Percent to total
Total funds available	4396.87	-
Total expenditure	4003.64	91.0
Total beneficiaries/ swarozgaris assisted (No.)	35167	-
SC	19580	55.7
Women	13599	38.7
Handicapped	436	1.2

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Sampoorna Grameen Rozgar Yojana (SGRY): The government of India launched a new centrally sponsored scheme, Sampoorna Grameen Rozgar Yojana (SGRY), involving an annual expenditure of Rs. 10,000 crore on 25 September 2001. Under the Scheme, 50 lakh tonnes of foodgrains (worth Rs. 5,000 crore, calculated at Rs. 10 kg) are to be provided every year to all the States and UTs free of cost and the remaining amount of Rs. 5,000 crore is to be utilized to meet the cash component for wages and material costs.

The objectives of the SGRY are to provide additional wage employment in rural areas and also food security, alongside the creation of durable community, social and economic assets and infrastructure development in these areas. The programme is self-targeting in nature and would be available for all the rural poor (BPL/APL) who are in need of wage employment and are willing to engage in it. Preference will be given to the poorest among the poor, women, SC/ST and parents of child-labour withdrawn from hazardous occupations. Under the Scheme, 5 kg of foodgrains (in kind) is to be distributed as part of wages per man-day. The remaining part of the wages is to be paid in cash to ensure the notified minimum wage. Punjab has fixed Rs. 5 per kg. as price of wheat.

During the financial year 2001-2002 the EAS and JGSY were continued as part of SGRY Scheme. From the financial year 2002-2003 onward, the allocation of funds would be made in a manner that each Panchayat receives a minimum of Rs. 50,000. The physical performance of JGSY (SGRY) for 2001-2002 is given in Table 21.

Table 21
Physical Performance of JGSY under SGRY- 2001-2002

Employment generated category-wise	(Lakh man-days) employment generated	
	During the month of March 2002	Cumulative including March 2002
SC	1.934	6.376
Others	0.611	2.378
Total	2.545	8.754
Women	--	--
Landless	--	0.130
Others	2.545	8.585
Disabled	--	0.169
	--	0.010

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

SGRY is executed in two streams:

First Stream: The first stream is being implemented at the district and intermediate Panchayat level; 50 per cent of the funds are to be earmarked (from out of the total funds available under the SGSY) for distribution between the Zila Parishads and intermediate level Panchayats (Panchayat Samitis) in the ratio of 40:60. (Of the 50 per cent funds under the first stream, 20 per cent are to be utilized by the Zila Parishads and 30 per cent by the intermediary level Panchayats)

Second Stream: The second stream is being implemented at the village Panchayat level; 50 per cent of the funds available under the SGSY are earmarked for the Village Panchayats and for distribution among the Gram Panchayats through Zila Parishads/ DRDAs. The allocation of funds is being made in a manner that each Panchayat receives a minimum of Rs. 50,000.

Works to be taken up: The works to be taken up will be labour-intensive, leading to the creation of additional wage-employment, durable assets and infrastructure, particularly those which would assist in drought-proofing, such as soil and moisture conservation works, watershed development, promotion of traditional water resources, afforestation and construction of village infrastructure and link roads, primary school buildings, dispensaries, veterinary hospitals, marketing infrastructure and Panchayat Ghars.

Employment Assurance Scheme (EAS): The primary objective of the EAS scheme, which has now been merged in SGRY, was to provide gainful employment, during the lean agricultural season, in manual works to all able bodied adults in rural areas who were in need and desirous of work, but could not find it. The work could be either on farm or in other allied operation or on the normal plan/ non-plan works during such a period. The secondary objective was the creation of community, social and economic assets for sustained employment and development.

During 2001-2002, against the total available funds of Rs. 10,15.83 lakh, Rs. 680.60 lakh, that is 67 per cent, was utilized. This helped in generating 5.11 lakh man-days. Out of the total man-days of employment generated 74 per cent were for SCs and two per cent for women. Table 22 gives the details of financial and physical achievements under EAS during the Ninth Five Year Plan (up to February 2002).

Table 22
Financial and Physical Achievement under EAS Scheme during Ninth Five Year Plan (upto February, 2002) (Rs. in lakh)

Item	1997-98 to 2001-02	Percent to total
Total funds available	15818.26	-
Total expenditure	9246.45	58.5%
Total employment generated (Lakh man days)	62.38	-
SC	45.19	72.4%
Women	2.79	4.5%
Landless	39.58	63.4%

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Jawahar Gram Samridhi Yojana (JGSY): JGSY is the restructured, streamlined and comprehensive version of the erstwhile Jawahar Rozgar Yojana (JRY). Designed to improve the quality of life of the poor, it was launched on 1 April 1999. The primary objective of JGSY was to create a demand-driven community village infrastructure, including durable assets at the village level and, to enable the rural poor to increase opportunities for sustained employment. The secondary objective was the generation of supplementary employment for the unemployed poor in rural areas. During 2001-2002 (upto January, 2002), against the total available funds of Rs. 1,101.82 lakh, Rs. 802.86 lakh, that is 73 per cent, was utilized. This helped in generating 5.56 lakh mandays, of which 3.96 lakh mandays were generated for SCs and 0.21 lakh for women. Table 23 gives the details of financial and physical achievements under JGSY during the Ninth Five Year Plan (up to February 2002).

Table 23
Financial and Physical Achievement under JGSY Scheme during Ninth Five Year Plan (upto February, 2002) (Rs. in lakh)

Item	1997-98 to 2001-02	Percent to total
Total funds available	7413.36	-
Total expenditure	6605.89	89.1
Total man days generated (in lakhs)	51.86	74.7
SC	38.76	-
Women	0.73	1.4
Handicapped	0.014	0.03

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Indira Awaas Yojana (IAY): The Government of India has been implementing IAY since 1985-86, with the objective of providing dwelling units free of cost to members of Scheduled Castes, Scheduled Tribes, and freed bonded labourers living below the poverty line in rural areas. From 1993-94, its scope has been extended to cover non-Scheduled Caste/ Scheduled Tribe rural poor. Benefits of the scheme have also been extended to families of ex-servicemen of the armed and paramilitary forces killed in action. Three per cent of the houses are reserved for the below-poverty-line disabled persons living in rural areas. During 2001-2002, against the total available funds of Rs. 894.29 lakh, Rs. 542.86 lakh, that is 61 per cent, has been utilized. This has resulted in the construction of 1,896 houses, 47 per cent of the target. Of the constructed houses, 91 per cent were constructed for Scheduled Castes. In addition, 976 houses were upgraded, 48 per cent of the target fixed. Out of the upgraded houses, 90 per cent were for the Scheduled Castes. For the year 2002-2003 the state has planned to spend Rs. 350.00 lakh as its share on this programme to construct 5,600 new houses and upgrade

2,800 houses. Table 24 gives details of the financial and physical achievements under IAY during the Ninth Five Year Plan (up to February 2002).

Table-24
Financial and Physical Achievements under IAY Scheme during Ninth Five Year Plan (upto February, 2002) (Rs. in lakh)

Item	1997-98 to 2001-02	Percent to total
Total funds available	5435.15	-
Total expenditure	4550.8	83.7%
Total number of houses constructed	21100	-
SC	19543	92.6%
Women	6820	32.3%
Handicapped	83	0.39%

Source: Data provided by the office of JDC (RD), government of Punjab, Chandigarh.

Pradhan Mantri Gramodaya Yojana (Gramin Awaas) (PMGY): The Pradhan Mantri Gramodaya Yojana (Gramin Awaas) is generally, based on the pattern of the Indira Awaas Yojana and will be implemented in rural areas throughout the country. During 2001-2002 (upto January, 2002), against the total available funds of Rs. 307.64 lakh, Rs. 83.48 lakh, only 27 per cent, was utilized. This resulted in the construction of 507 new houses and upgradation of 97 houses. For the year 2002-03 funds amounting to Rs. 500.00 lakh have been proposed to construct 2,000 houses and upgrade 1,000 houses. Table 25 gives details of financial and physical achievements under PMGY during the Ninth Five Year Plan (up to February 2002).

Table 25
Financial and Physical Achievements under PMGY Scheme during Ninth Five Year Plan (up to February, 2002)(Rs. in lakh)

Item	1997-98 to 2001-02	Percent to total
Total funds available	610.64	-
Total Expenditure	445.66	73%
Total number of houses constructed	1531	-
SC	1441	94.1%
Women	886	57.9%
Handicapped	-	-

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Special Project under SGSY: Under the SGSY scheme (for the year 2001-2002) the Government of India sanctioned Rs. 21.11 crore for five districts -- Amritsar, Gurdaspur, Ferozepur, Bathinda and Muktsar. However only Rs. 7.87 crore were released. The main achievements are given in Table 26 and 27.

Table 26
Financial Achievements of Special Project under SGSY (Rs. in lakh)

Name of district	Name of project	Total cost of the project	Funds released			Total funds available	Exp.
			GOI	State	receipt		
Amritsar	Carpet weaving	309.00	115.88	38.63	--	154.51	34.10
Bhatinda	Handloom	495.00	181.50	60.50	2.29	244.29	125.76
Ferozepur	Handloom	441.80	165.68	--	--	165.68	2.46
Gurdaspur	Dairy	495.00	185.63	59.64	--	245.27	44.27
Muktsar	Dairy	370.00	138.75	46.25	--	185.00	--
Total		2110.80	787.44	205.02	2.29	994.75	206.57

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Table 27
Physical Achievements of Special Project under SGSY

Name of district	Credit mobilized (Rs. in lakh)	Swarozgaries assisted (No.)
Amritsar	--	--
Bhatinda	90.00	373
Ferozepur	--	--
Gurdaspur	251.84	515
Muktsar	--	--
Total	341.84	888

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

Integrated Waste Land Development Project: Under this centrally sponsored scheme (IWDP), the Government of India sanctioned the projects to DRDAs of Bathinda and Sangrur for the year 1994-95 amounting to Rs. 409.13 lakh and Rs. 287.78 lakh respectively. Upto December 2001 the Government of India released funds amounting to Rs. 337.40 lakh to DRDA Bathinda and Rs. 41.81 lakh to DRDA Sangrur. In Bathinda District out of the total available funds of Rs. 347.49 lakh (including interest), Rs. 345.91 lakh was utilized. The Government of India has discontinued the project of Sangrur district, as its implementation has been show. Table 28 provides the financial and physical targets of various centrally sponsored schemes for 2002-03.

Table 28
Financial and Physical Targets for 2002-03 (Rs. in lakh)

Name of Scheme	Proposed allocation for 2002-03			Physical targets
	Center	State	Total	
SGSY	3150.00	1050.00	4200.00	6500 swarozgaries
SGRY	9375.00	3125.00	12500.00	60 lakh man-days
IAY	1050.00	350.00	1400.00	5600 houses to be constructed 2800 houses to be upgraded
PMGY	500.00	--	500.00	2000 houses to be constructed 1000 houses to be upgraded
Total rural sanitation	250.00	75.00	325.00	

Source: Data provided by the office of JDC (RD), Government of Punjab, Chandigarh.

The important point to be noted in the case of Punjab for all the centrally sponsored schemes is the utilization of the funds. These have never been fully utilized, mostly due to lack of matching funds from the state government. For example, in the case of the IAY scheme, the financial performance (achievement) during the Ninth Five Year Plan (upto February 2002) has been 83.7 per cent of the target. This ratio is 91 per cent for SGSY and 58 per cent for the EAS scheme.

Besides centrally sponsored schemes, the Government of Punjab has been implementing many welfare schemes for poor families from socially disadvantaged sections of the society, namely, stipend to SC girls studying in primary schools, housing for SC families, SCs Dharmasala, incentives for removal of untouchability, shagan scheme for SC girls at the time of their marriage, manure pits for SCs' families, kanya jagriti joyti scheme, financial help for handicapped, orphans, widows and old people and other nutritional schemes for pregnant women and under-weight children.

The main reasons for the failure of the earlier poverty alleviation programmes to eradicate poverty completely has been identified as: failure to reach the right beneficiaries, pilferages and leakages, procedural difficulties, inadequate assistance in some cases, beneficiaries using the money for other unproductive purposes, repayment of bank loans, lack of marketing of products, training, human resource development, and proper information about the schemes and centralized administrative processes. Some schemes, which are being implemented by the state, are duplicate in nature, for example, the housing scheme. These shortcomings have also been reflected in the evaluative studies by CRRID of IRDP (July 1995 to June 1996-- fifth round) and IAY (1998-99) in Punjab.

The implementation of these programmes could be made more effective by strengthening the inbuilt monitoring system by involving the community in their implementation through Panchayats. The poor are to be identified by the Gram Panchayats in the Gram Sabha meetings, and the list forwarded to the Panchayat Samitis (PSs), whose representatives should be made responsible for examining the list for its genuineness. Then the PSs should forward this list to Zila Parishads, which could play the role of a bridge between the state government and the grassroots level of governance. The need is to strengthen the district planning committees for better results.

Although, constitutionally local self-governance has been transferred to local bodies, the Panchayats have not been given the authority and responsibility to implement and prepare plans for economic development and social justice. The state government has not been paying attention to the recommendations made by its First and Second Finance Commissions, which have suggested measures for raising funds for the Panchayats, to make them self-sustainable. The need is to encourage the mass media to help increase awareness among the rural masses, especially the rural poor. The thrust of the plan strategy should also take into account the emerging social, political and cultural inequalities, besides economic upliftment.

MICRO-FINANCE AND RURAL BANKING

The availability of bank credit facilities can help to bring prosperity to rural people. There are 1,120 branches of scheduled commercial banks in the rural areas of Punjab. These constitute 44.7 per cent of the total number of branches functioning in the state in the year 2000. The share of rural branches has decreased from 54.4 per cent in 1990 to 44.7 per cent in 2000. The credit-deposit ratio for rural Punjab was 43.36 per cent, whereas for rural Maharashtra, it was 58.90 per cent in 2000 (Table 29).

Table 29
Number of Branches, Deposit & Credit and Credit-Deposit Ratio in All Commercial Banks for 1990 and 2000 (Rs. in lakh)

Name of the State/ India	No. of branches		Deposits		Credits		Credit-deposit ratio (%)	
	1990	2000	1990	2000	1990	2000	1990	2000
Punjab	1180 (54.4) 2170*	1120 (44.7) 2504*	250708 (28.9) 866824*	915018 (23.7) 3857206*	84737 (22.2) 382340*	396750 (26.3) 1506296*	33.80	43.3 6
Haryana	736 (57.8) 1273*	697 (46.7) 1491*	85505 (24.9) 343324*	344318 (20.2) 1705250*	58109 (28.0) 207801*	143535 (20.3) 706137*	67.95	41.6 8
Maharashtra	2491 (43.7) 5689*	2309 (37.1) 6216	148237 (4.5) 3281284*	602134 (3.9) 15299611*	111083 (4.9) 2276369*	351640 (2.7) 12820100*	74.93	58.4 0
All India	34184 (56.50) 60515*	32719 (50.00) 65521*	2623364 (15.3) 1719439*	12044675 (14.6) 82213276*	1606785 (15.4) 10431193*	4739602 (10.1) 46903171*	61.25	39.3 5

Source (i) *Banking Statistics, Basic Statistical Returns Volume 19, March 1990.*

(ii) *Banking Statistics, Quarterly Handout, March, 2000*

Note: (i) Figures in parentheses represents the share in rural region to the total of all the regions.

(ii) *denote the total in all the regions (rural, semi-urban, urban & metropolitan).

The slow growth of the rural non-farm sector could be attributed to the lower CD ratio (33.80% in 1990) for rural Punjab. Further, the share of credit to the rural non-farm sector was only 12.9 per cent of the total rural credit in 2000-01. The share of rural credit is more for agriculture machinery (34.4%) and dairy development (37.7%). (*Annual Report, Punjab, 2000-01, NABARD*). This reflects the priorities in our development strategy. These have been the development of agriculture and allied sectors (limited to dairy) and not the development of the rural non-farm sector. This sector has the potential of generating more employment, which has not been fully exploited so far. As agriculture is already over-capitalized in case of farm implements there is a need to shift credit towards agro-processing industries, storage, cold chains, market yards, transport, village and cottage industries and other services.

Traditionally, in the absence of an institutionalized banking system, rural people, especially farmers, approach moneylenders for their credit needs. The CRRID study on problems of credit for the cotton growers of Punjab shows that the need for their credit is still met by the commission agents (75.9%). It has been noticed that such type of credit did not help in capital formation but was used for consumption purposes and day to day needs of the rural people, which has not helped the growth of the non-farm sector.

The experiences of the Gramin Banks role of Bangladesh and Indonesia in the development of rural areas reveal how the formation of small homogenous groups (5-10 members) across religion, gender, caste, cluster and location played an important role in rural development, especially in the non-farm sector. The concept of Self Help Groups (SHGs) in India has been adopted in view of their successful with rural masses, who first

engage in small savings on their own for a specified period for use in case of an emergency that a group member might face. Once the bank is convinced that respective groups have budding ideas of starting micro-enterprise, they provide them the required financial support. The need is to adopt an approach where micro-finance could be made available to rural people, especially the poor, through improvement in the rural credit-delivery system.

MODEL VILLAGE PLAN

A model village will facilitate human resource development through better education, health and training and generate employment avenues both in secondary and tertiary sectors. Initially funds for infrastructure building, will have to be mobilized from government as well as non-government sources, such as non-government organizations, international funding agencies, non-resident Indians (NRIs), religious Institutions and other sources besides the village's income from its own sources. Consequently, for the maintenance and sustainability of public services, user's charges could be levied according to the social and economic position of the households. According to the concept of a globalized village, each village will be connected with modern information technology for better dissemination of information. This type of a village will have the potential of producing human resources catering to national as well as international requirements.

A model village is perceived as a village having all modern physical and social infrastructure facilities. According to HUDCO, the village to be developed as a model village has to adopt a convergence approach with integrated development, equipped with good housing, appropriate sustainable technology, site-specific functional planning, user-friendly and innovating designing, along with the integration of many other supportive inputs. The preparation of a model village plan has been perceived as a part of the community development programme of the Government of India since the very First Five-Year Plan. Although the green revolution in Punjab has helped in improving economic conditions of the people living in rural areas, our planning could help improve their quality of life only to a limited extent. Development of a model village, as perceived in our planning, has not been widely applied in its true sense.

An Action Plan, designed by CRRID in consultation with the representatives of Gram Panchayat/Gram Sabha for building a model village is given below;

- (i) Meeting of Gram Sabha
- (ii) Identification of village problems
- (iii) Prioritization of needs at village level
- (iv) Preparation and approval of plan
- (v) Technical consultation with the department of rural development for resource mapping
- (vi) Operational plan preparation by Gram Panchayat
- (vii) Identification and mobilization of resources

Begowal (Ludhiana) and Palahi (Kapurthala) villages of Punjab are appropriate examples of model villages, with a holistic development approach promoting social harmony and quality of life. CRRID has also developed a model village plan for village Khera Dona in Kapurthala district. It might be of interest to note here that a non-resident Indian of the same village sponsored this study of CRRID.

It is hoped that the character of a model village will shift from the present rural character, dominated by agriculture, to semi-urban, with a larger share of the income from secondary and services sectors than the primary sector. Within the primary sector the share of allied agricultural activities would increase, which would help in providing employment opportunities for people involved in agriculture as casual workers. Non-farm activities would also encourage contract arrangements in employment and not the casual one. It would further increase women's participation in work and slow down the out-migration process from villages to urban centres.

Palahi: An Integrated Village Development Model

Village Palahi is situated on a link road, which is three kilometres from Phagwara (district Kapurthala) on the northwestern side. The village has 548 hectares of cultivable land with 100 per cent irrigation facilities. The total population of the village is 3,800.

The National Rural Development Society (Regd) Palahi established in 1983 under the chairmanship of the village Sarpanch, is engaged in the overall development of Palahi in collaboration with the Panchayat. It is because of these collaborative efforts that today the village has all such as facilities like solar street lights, solar pumps, solar water heating systems, solar cookers, post office, commercial bank, co-operative society, sewing centre, sports stadium, library, health care hospital, government primary and high schools, community hall, Ambedkar Bhawan, water supply, ayurvedic dispensary, common tractor-run water tanker, public school, veterinary hospital, gobar gas plant, Gurudwara and Masjid. The National institute for Integrated Rural Development and Transfer of Technology (Palahi Community Polytechnic) is another big achievement of this village. This institution was started in 1984-85 with the aim and objective of imparting training in various technical and educational trades to educated, semi-educated and unemployed youths in the age group 18-35, in order to make them youth capable securing gainful employment or start their own ventures to cater for demands from local areas. The major activities of this institution are: manpower development and training, transfer of technology, setting up technical working units. The Polytechnic imparts vocational training in such courses as refrigeration, motor winding, welding, electrician's jobs, garment designing, commercial secretarial practices and software programming.

Palahi was once a typical *archetypal* Punjab village, but today, it not only boasts of a free Internet service, but also has a community hall, solar lighting, brick laned streets and biogas plants to convert manure into power. Palahi is the only village in the state where solar lighting and indoor toilets are common. The key to Palahi's success is its residents, who contributed in cash and kind for village development and its immigrant sons. Almost every household has one or more members settled in western countries, mainly, Britain, Canada and USA. This section of the non-resident population has made the village proud through their contributions in cash. Palahi's NRI sons provided Rs. 32 lakh of the Rs. 35 lakh spent for the community hall, which can seat 1,100 people. With a Community Centre Hall, a village Panchayat Complex, a Ferro-cement unit, a biogas plant, a library stocked with 12,000 books, football ground, badminton courts and a stadium, well-maintained schools, polytechnic centre, impressive clock tower and brick-lined streets, Palahi is a unique model for integrated development of a village.

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ROLE OF NGOs, SHGs AND CORPORATE SECTOR

Voluntary social services have been an integral part of the socio-cultural and religious ethos of our society from ancient times. The objective has been to increase human capacities by promoting non-economic factors such as education, health and nutrition, which in turn would speed up the process of economic development. The role of NGOs

is both co-operative and complementary to the state. The existence of NGOs assumes importance in the context of rural settings, as living conditions have deteriorated. State-NGO partnership alone cannot resolve all the socio-economic problems, hence it has to be in co-ordination with all agents of social change, i.e., the state, local self-governments, the corporate sector, academics and civil society groups.

The role of voluntary agencies in the development of rural areas can be to supplement efforts of government for the upliftment of the poor and needy disseminate information about development schemes and programmes of the government to rural people; make people aware of the consequences of female foeticides and imbalance in sex ratio; mobilize financial resources from the community; help in upgradation of skills of rural youths for self-employment opportunities; facilitate the formation of self-help groups and micro-finance; ensure protection of women and children's rights and abolish ills of child labour; and, make available technologies in a simpler form to the rural poor.

The work of voluntary agencies has been considered complementary to that of government in offering the rural poor a range of choices and alternatives, at low cost and with greater participation. Indian planning strategy has provided scope for the active involvement of NGOs in the planning process, and sufficient funds have been allotted for a wide range of anti-poverty and minimum needs programmes. A semi-autonomous body, The Council for the Advancement of People's Action and Rural Technology (CAPART), has already been functioning to administer these funds. The government has frequently sought to replicate voluntary initiatives on a large scale, especially in technological innovation, health care and education.

When individuals, on their own initiative, act in a conglomeration to meet their individual and common needs with the primary focus on self-reliance, it can be called a Self Help Group (SHG). Self-help implies a step beyond the stage of passivity to activity and of making a creative contribution. The benefits of self-help groups are based on co-operation rather than competition. They provide benefits of economies of scale, cost-effective alternatives for different financial services, collective learning, democratic and participatory culture and a firm base and platform for dialogue and co-operation. SHGs develop from a common binding force, common need, interest and concern, especially for the rural poor. It is this common binding force, which makes SHGs function more efficiently. The effectiveness of SHGs would be considerably enhanced if a symbiosis could be worked out between them and Panchayati Raj Institutions (PRIs). The key to this is the integration of SHGs with the democratically elected and empowered panchayats when the requisite devolution of power, functions and authority to the latter takes place. There is urgent need to work out a mechanism that will allow the SHGs and the PRIs to work in tandem and establish a system of reinforcing each other's work.

NABARD has been promoting the role of NGOs in the formation of SHGs, which could be made functional with their help. NGOs can also work with the formal as well as informal financial institutions and help in micro-financing the SHGs. In Punjab, there are only 541 SHGs who have taken credit from NABARD upto 2001. Such low numbers of SHGs are due to the fact that voluntary agencies, especially NGOs, are not very active in the state. A list of important NGOs and their respective areas of operation is given in Table 30. The existing SHGs have been mostly formed with the efforts of bank officials in co-operation with Panchayats.

Table 30
List of important NGOs in Punjab

Name	Activities
Adarsh Seva Samiti, Anandpur Sahib	Women's development
All India Jeev Raksha Bishnoi Sabha Abohar, (Ferozepur)	To protect animals and encourage a forestation
All India Pingalwara Society Amritsar and Jullandhar	a) To provide shelter and food to the destitutes, disabled orphans and mentally handicapped people b) Environmental literacy c) Forestation d) Rehabilitation of destitutes through vocational training
All India Women's Conference, Amritsar	Social justice and human rights
Bhartia Grameen Mahila Sangh, Chandigarh	(a) Welfare of women and children of rural areas (b) Social education to children (c) Community development
Doaba Shri Guru Singh Sabha, Jullandhar	To motivate people for reformative education. To run charitable hospital
Environment and Life Scientist Association, Ludhiana	To create awareness among the people in general and students in particular regarding environmental hazards, pollution and its effects and remedies, Educating masses regarding eco-friendly products
Family Planning Association of India, Mohali (Ropar)	Community participation for family planning through developmental activities, promotion of family life education
Indian Council of Social Welfare, Chandigarh	a) Upliftment of women b) Awareness programme on health issues c) AIDS control d) Anti-dowry campaign e) Self-employment schemes
Kharar Welfare Society, Kharar (Ropar)	To promote social work in Kharar Tehsil
Manav Kalyan Shiksha Kender, Mohali (Ropar)	a) Social welfare b) Welfare of physically and socially, handicapped sections of the society
Manav Sudhar Sabha, Sialba Majri (Ropar)	(a) To work for village slum areas (b) Promotion of socio-economic programme for helping the needy (c) Relief and assistance to people stricken by natural calamities like floods, earthquake, storms and rains.
National Institute for IRD and Transfer of Technology, Palahi (Kapurthala)	a) Manpower development and training b) Transfer of technology to the villagers c) Total village development
Nishkam Seva Ashram Village Daad (Ludhiana)	a) To fight against poverty, hunger, unemployment and diseases b) Schools in slum areas c) Home for the aged d) Income generation for women and physically handicapped e) Hospital, medical facilities and dispensaries f) Community services
Phagwara Environmental Association, Phagwara (Kapurthala)	a) Environment awareness b) Plantation

Pargati, Hoshiarpur	(a) Women's development and literacy (b) Environment protection (c) Promotion of local artisans and handicrafts
Punjab Action Group for Rural Development, Phagwara (Kapurthala)	Rural development
Punjab Women Welfare, College Road, Hoshiarpur	(a) To impart training to women in different technical trades under Nehru Rozgar Yojana (b) Free training to poor and handicapped (c) Financial help to under-privileged peoples who are victims of riots or natural calamities
Rural Development and Social Welfare Society – Patiala	(a) To provide vocational training to the rural/urban unemployed youth (b) Transfer of low cost technology for rural needs (c) Environmental sanitation and non-conventional energy resources. (d) To raise living standards of rural people through use of modern technology
Rural Human Development Centre, Nurpur Bedi (Ropar)	(a) Rural development with special emphasis on women development (b) Rural technology (c) Conduct workshops for Mahila Mandals and train them about livestock rearing
SDKS Shri Dasondhi Ram Birji Foundation, Patiala	(a) Social work (b) Upliftment of downtrodden (c) Relief work for poor, needy students and victims (d) Awareness for health education and peace
Sewa Bharti, Chandigarh	(a) Sewa, Service and Sanskar Samratha in labour colonies (b) Working for the development of weaker sections of the society.
Shanti Swaroop Memorial Education Society, Roopnagar	(a) Promotion of education in remote areas with special emphasis on women's education. (b) Economic development of women through vocational training by imparting traditional and non-traditional skills (c) Health (d) Environmental awareness
Society for Education, Environment and Protection of Animals, Amritsar	(a) Green India and clean India (b) Anti-pollution and pro-conservation (c) Environment awareness (d) Plantation
The Centre for Development Action, Patiala	Involvement in development projects with focus on growth and under-privileged people.
The Nagar and Gram Sudhar Mahila Society, Rajpura (Patiala)	(a) Awareness on health education (b) Social work (c) Vocational training for women (d) Children's library (e) Legal aid for women
The Punjab Rural Education Promotion Council, Ludhiana	(a) To promote rural education, especially in rural schools
The Rationalist Society Punjab, Barnala (Sangrur)	(a) To annihilate superstitions (b) To inculcate scientific temperament (c) General awareness about environment and pollution
Volunteers for Social Justice, Phillaur (Jalandhar)	(d) Upliftment of under-privileged sections, especially Scheduled Castes, Schedule Tribes and landless workers. (e) Creating legal awareness among under-privileged sections for freedom of life. (f) Elimination of child and bonded labour.

Source: DAINET, *NGO Directory* (a directory of Non-governmental Organizations in India), Volume-II - Chandigarh, Haryana, Himachal Pradesh and Punjab, Development Alternatives Information Network, New Delhi, 1998.

There is scope to channelize such micro-finances through religious institutions in the state, which are active in the development process. For example, in Punjab, there are many religious and charitable trusts, which successfully run vocational and training centres for better self-employment opportunities and organize various camps on health. There are many educational institutions run by religious bodies.

NGOs can play a significant role in strengthening local self-government by facilitating interaction and co-operation with state departments and also acting as catalysts to effectively implement various departmental schemes. Experiences of the CRRID-LIP programme in two blocks of Punjab have shown that NGOs, in co-operation with the state, religious institutions, local self-government and the corporate sector are able to promote people's participation in the implementation of many development projects, (especially in the area of health) more effectively and efficiently.

CRRID-LIP Goal

CRRID-LIP, implemented with the financial support of Bill and Milenda Gates Foundation and technical inputs from MSH, Boston and TAI, Bangladesh, was intended to improve access to high quality RCH services through local resources mobilization, women's empowerment, social development, community participation and quality improvement in the RCH programme.

Achievements

Quantitative Achievements

- The contraceptive prevalence rate (CPR) increased from 62.79 per cent in December 2000 to 68.28 per cent in March 2002.
- The ante-natal checkups (with TT/IFA) of pregnant women increased from 83.11 per cent in December 2002 to 89.60 per cent in March 2002.
- Post-natal checkups of delivered women rose from 58.0 per cent in December 2002 to 82.83 per cent in March 2002.
- Percentage of institutional deliveries rose from 46.40 per cent to 62.39 per cent during the same period.
- 0-1 children having complete vaccination with measles/vitamins-A increased from 57.90 per cent to 78.11 per cent.

Qualitative Achievements

- 2564 focus group discussions organized with eligible couples on RCH issues in which 26,099 persons participated.
- 1445 focus group discussions organized with adolescents on Family Life Education (FLE) and 21,478 adolescents participated.
- 1913 focus group discussions organized with community members and 19861 members participated.
- FLE programs organized in 61 schools in which 5,359 pupils and 256 teachers oriented.

The CRRID-LIP project has achieved its goal and objectives through a unique blending of inter-sectoral co-ordination, community participation and gender empowerment with Panchayati Raj Institutions and CHVs shouldering the responsibility of LIP RCH service implementation. Moreover, the role played by the religious institutions and religious leaders, Youth clubs members, Mahila Mandal Members, Self Help Groups and Ex-servicemen cannot be overemphasized. The LIP vision to uplift the RCH status of the population is a 'shared one', where the programme inputs are co-ordinated with the community inputs and household inputs as well as inputs from the government health sector, resulting in developing a successful model which can be replicated in any part of India with modifications.

Source: *Final Report, CRRID-LIP, CRRID*

RECOMMENDATIONS

Rural society occupies an important place in Punjab's economy. About two-thirds of the state's population are dependent on agriculture and allied activities, which provide about 40 per cent of Punjab's Gross Domestic Product at factor cost at current prices. No development programme can succeed if it is not built on the foundation of the rural

sector. There is dire need to give high priority to rural development and to formulate an integrated rural development policy, taking into account the following recommendations:

- Ensure effective dissemination of information, education and impart training to the elected representatives of PRIs for overall rural development.
- Introduce rural higher education, based on the concept of Nai Talim as envisaged by Mahatma Gandhi for human resource development, keeping in view local requirements of rural management, engineering, science and technology and research, training, networking and extension.
- Need to develop rural agro-based industries, which have the potential of absorbing the surplus agricultural labourforce and checking migration to urban areas.
- Co-ordinate between Panchayats, government, NGOs and the corporate sector to upgrade skills of rural people and improve their quality of life, by establishing rural enterprises catering to their skills and needs.
- Maintain and upgrade existing rural infrastructure and promote such facilities as storage, cold chain, food parks, marketing intelligence network to facilitate agro-processing industries.
- Prepare and implement plan for 'Model Village', involving Gram Sabha/Gram Panchayats for decentralized micro-planning, to avail of modern physical and social infrastructure facilities required for a better quality of life.
- Upgrade rural market growth centres for agricultural produce, according to international requirements, in view of WTO.
- State should raise matching funds required for full utilization of central funds under centrally sponsored poverty alleviation schemes.
- Ensure required credit facilities by rural banks to non-farm activities (manufacturing and tertiary sectors).
- Evolve and adopt indigenous concepts and theories of development, to resolve the problems confronting the state government, PRIs and stakeholders during the process of rural development.
- The Government of India in certain cases provides funds for development of rural areas through the agency of NGOs, whereas PRIs, being the real representative bodies of the people, are not treated as NGOs. The Government of India should abandon this approach and provide funds from all agencies, including International funding, to PRIs.
- The pace of rural development could be accelerated by transferring the 29 subjects mentioned in the 73rd Constitutional Amendment Act, 1992 and devolving funds and functionaries to the Panchayati Raj Institutions. The state government is in the process of adopting the central pattern of devolution of functions, functionaries and funds in respect to these 29 items. The Government of India is also required to devolve to the PRIs similar functions in respect of schemes implemented by its various ministries in rural areas.
- Most of the rural poor belong to Scheduled Caste families, which have been discriminated against for long. The concept of poverty has to be understood from a different angle in Punjab, as the proportion of Scheduled Caste population is very high in rural areas (32 %) as compared to other states, and the rural society of Punjab is of a heterogeneous character. In addition, the status of women in Punjab could not be improved as desired, which is reflected in the low sex ratio of the state (874 per 1,000 males) and their low participation in economic

activities. This situation is further aggravated by the prevalence of female foeticide in the state. Besides the plight of SCs and women, Punjab is facing a peculiar situation emerging out of the marginalization of the peasantry, which is rendering marginal and small farmers landless. Strategically, Punjab should take into account these factors while designing policy programmes to uplift the poor.

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29 items mentioned in the 73rd Constitutional Amendment Act, clubbed into five broad categories

(I) Agriculture and Allied Activities

- Agriculture, including agriculture extension
- Land improvement, implementation of land reforms, land consolidation and soil conservation
- Minor irrigation, water management and watershed development
- Animal husbandry, dairying and poultry
- Fisheries
- Social forestry and farm forestry
- Minor forest produce
- Fuel and fodder

(II) Rural industrialization

- Small-scale industries, including food- processing industries
- Khadi, village and cottage industries

(III) Infrastructure Development

- Rural Housing
- Drinking water
- Roads, culverts, bridges, ferries, waterways and other means of communication
- Rural electrification, including distribution of electricity
- Markets and fairs
- Non-conventional energy sources
- Maintenance of community assets

(IV) Human Development

- Technical training and vocational education
- Adult and non-farm education
- Cultural activities
- Health and sanitation, including hospitals, primary health centres and dispensaries
- Family welfare
- Poverty alleviation programme
- Education, including primary and secondary schools
- Libraries

(V) Social Welfare and Gender Development

- Women and child development
- Social welfare including welfare of the handicapped and mentally retarded
- Welfare of weaker sections and in particular of Scheduled Castes and Scheduled Tribes
- Public distribution system.

Table A
District-wise Percentage Shift of Rural Non-farm Employment and Shares of Secondary and Tertiary Sectors in Punjab

Region/ District/ State	Household industry		Non-household industry		Construction		Trade & commerce		Transport storage & communication		Other services	
	1981	1991	1981	1991	1981	1991	1981	1991	1981	1991	1981	1991
Majha												
Gurdaspur	7.51	2.11	21.85	15.43	6.70	11.64	18.66	14.86	10.29	8.57	35.35	47.37
Amritsar	8.62	1.56	19.03	19.20	5.93	5.41	20.59	17.00	14.03	13.02	32.51	43.84
Doaba												
Jalandhar	11.55	6.15	30.97	27.33	7.41	8.16	14.24	16.69	9.27	10.30	26.56	31.37
Kapurthala	6.97	4.07	29.00	31.00	7.35	7.87	15.60	15.94	8.24	7.83	32.84	33.31
Hoshiarpur	11.61	6.53	16.52	17.83	7.94	7.81	16.65	13.93	9.68	7.95	37.60	45.95
Malwa												
Rupnagar	9.73	3.98	22.41	17.35	7.08	5.52	11.74	11.45	9.47	10.94	39.57	50.76
Patiala	5.25	5.49	27.76	24.86	6.82	7.14	17.34	15.44	10.93	10.25	31.90	36.82
Sangrur	15.07	6.31	16.78	21.28	6.58	6.62	20.56	18.73	7.25	9.77	33.79	37.29
Bathinda	14.04	7.63	18.74	14.89	9.46	9.60	18.73	19.22	7.25	7.11	31.78	41.55
Faridkot	11.60	5.92	21.58	18.26	6.92	5.08	16.73	16.11	8.85	8.17	34.31	46.46
Ferozepur	9.18	4.89	17.13	18.82	6.42	6.76	24.55	19.88	9.67	9.12	32.81	40.53
Ludhiana	10.34	2.10	25.11	28.04	4.51	4.74	14.85	15.03	11.62	12.95	33.59	37.14
Punjab	9.96	4.53	22.29	21.25	6.80	7.25	17.41	16.79	10.16	9.97	33.33	41.11

Source: Directorate of Census Operations, Punjab.

Chapter 6

INDUSTRIAL DEVELOPMENT

THE INDUSTRIAL SECTOR OVER THE YEARS

At the time of independence, Punjab had only a few hundred industrial units mainly processing foodgrains, cotton ginning and brick kilns. Most of the manufactured items of even common use came from outside. During the post-independence period, industrial development in Punjab took place in phases. Thus, in the fifties the cycle-parts and hosiery industries took their roots, while in the sixties, with the advent of the green revolution, agriculture-related industries like farm machinery manufacturing came up. The main focus in the seventies was on such industries as auto-parts and electronic items and during the eighties on such resource-based industries as food processing, vanspati, edible and non-edible oils and sugar in a big way. Diversification of industry started, with the process of liberalization and economic reforms, while many of the established processing units, both in the small and medium and large sectors, came under pressure. The industrial sector in the state is in the throes of a very significant phase of transition with severe challenges and many new opportunities.

Share of manufacturing sector in SGDP

Table 1
Percentage Share of Manufacturing Sector in Gross Domestic Product

Year	At Current Prices		At Constant Prices	
	Punjab	India	Punjab	India
1980-1981	11.61	17.70	11.61#	17.70#
1985-1986	13.51	17.90	14.40#	19.40#
1990-1991	15.05	18.60	16.58#	21.10#
1995-1996	15.76	18.10	15.80*	17.90*
1996-1997	15.23	17.70	15.58*	18.20*
1997-1998	15.04	16.70	15.88*	17.70*
1998-1999	14.04	15.60	15.99*	17.00*
1999-2000	14.44	15.40	15.84*	17.10*

Source: *National Accounts Statistics*, CSO, Government of India
Statistical Abstract of Punjab ESO, Government of Punjab

Note: (#) At 1980-81 (Constant) Prices, (*) At 1993-94 (Constant) Prices

The share of the manufacturing sector in the State Gross Domestic Product which was (at current prices) 11.61 per cent during 1980-81 gradually increased to 15.76 per cent in 1995-96, but showed a declining trend later and, during 1998-99, it came down to 14.04 per cent. Subsequently, during 1999-2000 it went up slightly to 14.44 per cent as shown in Table 1. At constant prices the share of the manufacturing sector has shown a similar trend and it has been almost at the same level since 1995-96. The share of the manufacturing sector at constant prices has always been higher than at current prices, indicating that prices of manufactured goods are not rising at par with the prices of other goods. The share of the manufacturing sector in the Gross National Domestic Product at current as well as constant prices has always been higher than in the State Gross

Domestic Product, which indicates that Punjab is still comparatively less industrialized. For obvious reasons, for transforming a traditional economy into a modern, dynamic economy, the share of the secondary sector, including manufacturing, as well as the tertiary sector in the State Gross Domestic Product should steadily increase over time, while the share of the primary sector should decline.

Growth of industrial sector

Tables 2 and 3 clearly show that the industrial sector has grown at an impressive rate during the Sixth FYP (1980-85) in terms of number of units, employment, investment and production. During the Seventh FYP (1985-90) the large and medium sector has shown better growth both in terms of investment and production, but the overall growth rate of the SSI sector has declined. Production showed an impressive growth during the Eighth Plan. This high rate of growth in production may be attributed to the investment made during the Seventh and Eighth FYPs. Many new large and medium units came into operation during this period. However, the growth rate of employment has been continuously declining during the Seventh, Eighth and Ninth Plan periods. The implications of this trend and its impact on the economy deserve to be critically examined in depth. During the first three years of the Ninth FYP there has been an all round decline in the growth rate of the industrial sector in terms of the number of units, employment, investment and production.

Table 2
Growth of Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (lakh) current prices			Production (lakh) current prices		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1980-81	43338	228	43566	264869	109767	374636	33202	72742	105944	111844	114107	225951
1985-86	97517	292	97809	464809	132174	596983	73894	148972	222866	215100	253453	468553
1992-93	181563	414	181977	728580	188034	916614	162097	519461	681558	535515	933525	1469040
1996-97	193332	586	193918	821170	219383	1040553	249133	984465	1233598	1109622	2138765	3248387
1997-98	195383	620	196003	840568	221154	1061722	285999	1172084	1458083	1305774	2540577	3846351
1998-99	197344	602	197946	864592	227929	1092521	336067	1403854	1739921	1444447	2537561	3982008
1999-2000	199071	611	199682	883005	235993	1118998	379368	1476581	1855949	1661085	2372014	4033099

Source: Director of Industries, Punjab

Note: (SSI) Small Scale Industry, (L&M) Large & Medium Scale Industry

Table 3
Annual Average (Linear) Growth Rate of Industry during Five Year Plans in Punjab (%)

Plan	Years	Units			Employment			Investment			Production		
		SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
6 th Plan	1980-85	21.32	6.16	21.25	13.67	6.19	11.60	19.24	14.75	16.18	16.30	19.57	17.87
7 th Plan	1985-90	10.77	5.40	10.75	8.36	5.31	7.66	13.16	19.80	17.67	12.37	20.18	16.61
8 th Plan	1992-97	1.85	8.24	1.87	2.91	2.56	2.83	10.71	16.84	15.42	20.40	22.82	21.81
9 th Plan	1997-00	0.98	1.46	0.98	2.45	2.47	2.45	15.06	14.67	14.73	14.43	4.05	7.74

Source: Based on data from Director of Industries, Punjab

Table 4 shows major industrial sector-wise break up of industry in Punjab as on 31 March 2000. The important sectors in terms of production, investment, employment and export potential are bicycle and bicycle parts and automobile and components (transport

equipment and parts), agro/food processing (food products and beverages), textiles and hosiery, basic metal, metal products, machinery other than electrical and electronics industry. These sectors have contributed about 70 per cent of the total industrial output. Bearing in mind their significance for the economy of the state in general and industry in particular, they will be discussed in the following sections with a view to highlighting their technological status, human resource development, and other factors that impinge on their potential for growth.

Table 4
Major Sector-wise Statistics of Industry as on 31 March 2000

NIC Code	Name of the industry	Units		Employment		Fixed Investment		Production	
		(No.)	%*	(No.)	%*	Rs. lakh	%*	Rs. lakh	%*
20-22	Food Products & Beverages	9765	4.89	97704	8.73	273139	14.72	752769	18.66
23-26	Textiles, Hosiery & Garments etc.	14556	7.29	190337	17.01	528706	28.49	668973	16.59
27	Wood products	11623	5.82	39472	3.53	11509	0.62	30353	0.75
28	Paper products	3527	1.77	23055	2.06	70258	3.79	87758	2.18
29	Leather & Leather products	14488	7.26	38242	3.42	10241	0.55	33356	0.83
30	Rubber & Plastic products	4567	2.29	43537	3.89	53317	2.87	183483	4.55
31	Chemical and products	4022	2.01	36792	3.29	252516	13.61	444896	11.03
32	Non-metallic mineral products	2556	1.28	31684	2.83	24387	1.31	52243	1.30
33	Basic metal products (Forging, Re-Rolling & Casting)	5645	2.83	69837	6.24	119858	6.46	477530	11.84
34	Metal products (Hand tools)	20579	10.31	103505	9.25	39465	2.13	150958	3.74
35	Machinery & parts except electrical (Machine Tools)	10644	5.33	67691	6.05	53143	2.86	226415	5.61
36	Electrical machinery & parts (Incl. Electronics)	4438	2.22	32657	2.92	123238	6.64	147942	3.67
37	Transport equipment and parts (Automobiles & Parts, Bicycle & Parts)	6955	3.48	105574	9.43	167151	9.01	506915	12.57
38	Miscellaneous Industry (Sports Goods)	3030	1.52	16615	1.48	51958	2.80	51965	1.29
74-99	Repairing and servicing	36984	18.52	82996	7.42	26883	1.45	41358	1.03
	Non-SIDO Industries	46303	23.19	139300	12.45	50179	2.70	176185	4.37
		199682	100	1118998	100	1855948	100	4033099	100

Source: Director of Industries, Punjab

Note: (*) % Indicates the share of the sector to total Industry.

Concentration of industry

Tables 5 and 6 on distribution of industry indicate that the main industrial centres in Punjab are Ludhiana, Jalandhar, Amritsar, Mandi Gobindgarh, Batala and Mohali. Ludhiana is known for the production of hosiery and readymade garments, bicycles and components, sewing machines and parts, machine tools, auto-parts, industrial fasteners,

electrical and electronic goods. About 21 per cent of the total industrial units in Punjab are located in Ludhiana district. Famous for hand tools, pipe fittings, valves and leather products, Jalandhar is well-known for its sports-goods too. Mandi Gobindgarh, popularly known as the 'Steel-Town' of Punjab, hosts more than 300 steel re-rolling mills despite being situated far from the sources of raw materials. Batala is famous in the country for its castings and machine tools, while Amritsar is known for food products, paper machinery and textiles. Mohali near Chandigarh, which attracted a number of 'sunrise industries', thanks to its locational advantages and infrastructure, seems to have lost its momentum for growth in recent years.

District Ludhiana leads Punjab in industrialization. More than 28 per cent of the industrial output of Punjab comes from Ludhiana, which has the highest number (166) of large and medium units. While Amritsar and Jalandhar were traditionally more advanced, Sangrur, which was one of the centrally declared Backward Districts and Patiala, have become fast growth areas.

Districts Bathinda, Ferozpur, Gurdaspur, Hoshiarpur, Kapurthala and Moga, each contributes two to five per cent share to the state's industrial production; while Faridkot, Mansa and Muktsar each contributes less than one per cent share. These districts are industrially backward and 'A' category incentives are provided to industry coming up in them under the Industrial Policy, 1996.

Table 5
District-wise Distribution of Industry in Punjab as on 31 March 2000

District	Units (No.)			Employment (No.)			Investment (lakh)			Production (lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
Amritsar	27221	58	27279	113748	19007	132755	49999	84631	134630	208335	95865	304200
Bathinda	6318	17	6335	19327	4601	23928	12716	61877	74593	59098	86787	145885
Faridkot	2528	5	2533	11721	804	12525	6482	5487	11969	19254	5603	24857
Fatehgarh Sahib	3866	17	3883	19215	3015	22230	16095	18811	34906	125948	61596	187544
Ferozpur	6391	20	6411	25635	6996	32631	20796	15702	36498	47216	47329	94545
Gurdaspur	11543	19	11562	54029	4768	58797	14540	15563	30103	65822	33494	99316
Hoshiarpur	9109	33	9142	29085	14912	43997	10045	106903	116948	18901	137164	156065
Jalandhar	27790	26	27816	143549	9696	153245	40077	27122	67199	190406	47760	238166
Kapurthala	7792	7	7799	25119	17603	42722	8237	91349	99586	31865	126181	158046
Ludhiana	42232	166	42398	265871	72252	338123	95664	302577	398241	556094	597737	1153831
Mansa	2753		2753	8781		8781	4074		4074	29533		29533
Moga	5245	5	5250	19285	1701	20986	8698	22316	31014	28044	82907	110951
Mukatsar	4061	7	4068	17182	2095	19277	7728	10892	18620	18796	18821	37617
Nawan Shehar	3934	14	3948	10360	6771	17131	2757	53703	56460	5900	101866	107766
Patiala	12579	109	12688	45041	32272	77313	39300	266377	305677	126840	363461	490301
Ropar	8754	59	8813	28967	20398	49365	18389	245173	263562	41489	407266	448755
Sangrur	16955	49	17004	46090	19102	65192	23770	148098	171868	87543	158177	245720
TOTAL	199071	611	199682	883005	235993	1118998	379367	1476581	1855948	1661085	2372014	4033099

Source: Director of Industries, Punjab

Table 6
District-wise Distribution and Types of Industries in Punjab

District	Concentration of types of industries
Amritsar	Power Loom Weaving, Wood & Machine Screws, Radio & Transistors, Agricultural implements, Paints & Varnishes and Dyes, Electric fans, Pharmaceuticals, Printing machinery, Textiles, Chemicals, Soap, Acids.
Bathinda	Cotton ginning and processing, Pharmaceutical, Flour mills
Faridkot	Agricultural implements, Cottonseed oil, Rice bran oil
Fatehgarh Sahib	Steel re-rolling, Pump parts, Sewing machine parts, Truck body building
Ferozepur	Cotton ginning & processing, Grey board, Flour mills, Agricultural implements, Millboard
Gurdaspur	Agricultural implements, Conduit pipes, Machine tools, Soap & chemical products, C.I. castings, Brassware
Hoshiarpur	Rosin & Turpentine oil, Paints & Varnish, Sugar, Agricultural implements, Pressure cookers, Paper and Paper board
Jalandhar	Surgical instruments, sports goods, Hand tools, Automobile parts, Cocks & valves, Pipe fittings, Bus body building, Leather tanneries, Ball bearings, Publication, Switch & switch-gears and Rubber goods
Kapurthala	Agricultural implements, Pressure cookers, Fans, Wood & Machine screws, Electrical goods, Rice Mills, Rubber goods, Bolts & Nuts and Diesel engines.
Ludhiana	Bicycles & bicycle parts, Automobile parts, Hosiery goods, Sewing machine & parts, Home appliances, Machine tools, Readymade garments, Hosiery needles, Rubber goods, Labels (Metal & Cotton), Chemical goods, Oil engines, Agricultural implements, Electronic goods, Tractor parts, Cycle tyres/tubes, Plastic goods
Mansa	Agricultural implements, Cotton spinning
Moga	Agricultural implements, Milk products.
Muktsar	Cotton yarn, Rice Bran Oil, Paper
Nawanshahar	Light Commercial Vehicles, Pharmaceutical, Yarn, and Sugar
Patiala	Automobile parts, Sewing machine parts, Enamelled copper wire, Electrical goods, Bakery machinery, Cutting tools, Biscuits, shoes
Rup Nagar	Agricultural implements, Pharmaceuticals, Tractors & Parts, Electronic components, Electrical components
Sangrur	Agricultural implements, Tractor parts, Cycle parts, Sewing machine parts, Milk products, Chilled Rolls

Source: Director of Industries, Punjab

Exports

During 1999-2000 the total value of exports from Punjab was Rs. 4,062 crores. The major sectors which have made significant contribution towards exports from the state are woollen textiles, bicycles and parts, hosiery goods, hand tools, leather products, and

sports goods. Export of principal items during 1997-98 to 2000-01 is shown in Table 7. The trend of exports has not been uniform and has been nearly stagnant of late.

Table 7
Statement Showing Value of Exports (Rupees lakh)

Principal items	1997-98	1998-99	1999-2000	2000-01
Woolen Textile	84623	86236	91838	93424
Carpets	6139	9082	13131	7224
Hosiery/Readymade garments	50757	44502	51816	52472
Tanned/chrome leather products	10366	8259	11375	11814
Sewing machine & Parts	4360	7556	6539	5215
Electric switch gears/Electronic goods	6240	2362	7218	1415
Engg. Goods	12585	14946	14274	15228
Auto parts	8434	13862	14282	14415
Bicycle parts/Moped	88956	46243	51620	52016
Sports goods	24644	16144	19318	20416
Machine tools	6779	7123	8131	8029
Hand tools	28417	22917	26872	24059
Rice	48554	49886	52872	49916
Food products	6698	4914	8014	6415
Diesel engines	3844	3126	4475	@
Drugs & Pharmaceuticals	2316	1409	3431	@
Handicrafts	@	@	@	742
Other items	26766	24346	21056	38696
Total	420478	362913	406262	401496

Source: Director of Industries Punjab

Note: (@) Included in other items

BICYCLE AND BICYCLE PARTS INDUSTRY

The second largest manufacturer of bicycles and bicycle parts in the world, India produced 13.1 million bicycles in 2000, while China produced 52.2 million. The Ludhiana cluster produces about 60 per cent of the total bicycles manufactured in the country in the large and small-scale sector and more than 80 per cent of the parts and components in the small and tiny sector. The first indigenously owned bicycle-

manufacturing unit, Atlas Cycles, was established at Sonapat in 1951 in the SSI sector in undivided Punjab. Hero Cycle Ltd. commenced production of complete bicycles in 1956 as an SSI unit in Ludhiana and became the world's largest producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records.

Status of bicycle industry

Though the bicycle industry originated in Kolkata, Punjab became the most fertile ground for its evolution and growth. It mainly manufactures the roadster model (70 % of total production) with standard single speed with cosmetic variations. The remaining 30 per cent of the production is of new models, such as Sporty Light Roadster (SLR), All Terrain Bike (ATB), British Motor Cross (BMX), Mountain Terrain Bike (MTB), Racer, children, juvenile, etc. These bicycles are quite heavy in weight, varying between 10 to 18 kg. The unique feature of this industry of Punjab is that the components and parts (numbering 300) are manufactured in about 4,000 small and tiny units for both domestic as well as export markets. More than 80 per cent of the total components and parts of complete bicycles are produced in the small and tiny sector. Table 8 presents the status of the industry for the last five years (SSI including tiny sector and the large and medium), showing time-series data on the number of units, number of employees, production and investment. Production has increased at an average annual growth rate of 12.8 per cent during 1995-96 to 1999-2000.

Table 8
Status of Bicycle and Bicycle Parts Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (lakh)			Production (lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M*	Total*
1995-1996	3538	7	3545	43433	10476	53909	8770	18755	27524.93	91531	100013	131536
1996-1997	3615	8	3623	43898	9773	53671	952219	22295	31824.27	109053	112170	153921
1997-1998	3703	8	3711	44564	10843	55407	10178	31168	41345.91	133040	98532	172453
1998-1999	3753	6	3759	45335	10475	55810	11314	35158	46472.47	152485	110448	196664
1999-2000	3773	8	3781	45730	11011	56741	12296	41752	54048.27	170034	120520	218242

Source: Director of Industries, Punjab

Note: * - Only 40% (value added) of the production of L&M sector is added

Capital-output ratio and investment per employee

The capital output ratio of the SSI and tiny sector is consistently declining as shown in Table 8. The industry is largely primitive, neither replacing the existing obsolete machinery, nor adopting the latest and improved technology. On the other hand, in the large and medium sector the capital-output ratio has been continuously improving during the same period. The investment in the SSI sector per employee has increased from Rs. 20,000 in 1995-96 to Rs. 27,000 in 1999-2000; in the large and medium sector it has increased to Rs. 3,80,000 from Rs. 1,87,000.

Exports

As shown in Table 9 the export value of bicycles and parts in Punjab in 1995-96 was Rs. 43,611 lakh, which increased to Rs. 70,643 lakh in 1996-97 and to Rs. 88,956 lakh in 1997-98. Exports declined sharply during 1998-99 to Rs. 46,243 lakh. During 1999-2000 it increased to Rs. 51,620 lakh and remained at the same level in 2000-01.

Table 9
Exports of Bicycle Industry

Year	Exports (Rs. lakh)	Change (%)
1995-1996	43611	
1996-1997	70643	62
1997-1998	88956	25
1998-1999	46243	48
1999-2000	51620	12
2000-2001	52016	--

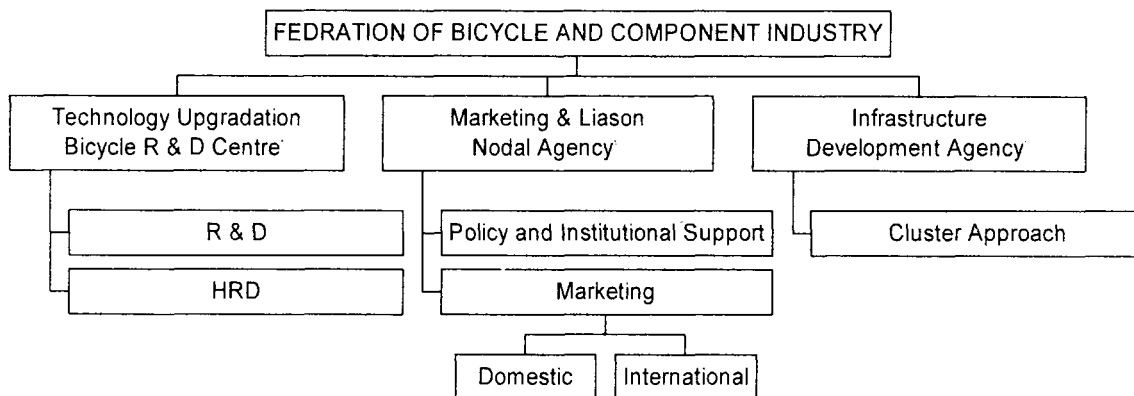
Source: Director of Industries, Punjab

Technological status: some observations

- Most of the components of our cycles are made from mild steel, with the latest introduction of plastics and aluminum for the export market only. Even the steel of desired specifications and quality is not available at reasonable rates.
- Quality control system is generally poor. The component manufacturers, being mostly in the tiny sector, have very inadequate quality control systems. Even at the assembly stage and in retailers and shops, the mechanics are not adequately trained and aware of the importance of various alignments, etc.
- The ordinary bicycle comprises of as many as 300 individual components and over 1,500 operations are performed to manufacture it. Various manufacturing techniques prevalent in our country are not only time consuming, but also causing extensive raw material wastage.

Strategy for future development

A well-defined strategy has to be formulated to sustain and accelerate the present growth rate and increase the market size, both domestic and export, against the backdrop of stiff competition from China. The industry has to produce quality products and introduce new designs in the market for survival. Technological upgradation through innovative R&D, human resource development through skills-upgradation and training, adoption of the cluster approach for systematic infrastructure development and market oriented policy and institutional framework are absolutely essential for growth.



Based on a wide-ranging interaction with various segments of the industry, which sometimes have divergent points of view, it is suggested that a single federation of bicycle and bicycle parts industries with different association as its constituents should be formed to promote overall growth. The federation should evolve appropriate mechanisms for providing R&D, marketing, policy and infrastructural support to facilitate growth. The proposed federation could have the following structure:

Technology upgradation

Wide technology gaps have been observed between the technologies in use in the developed countries and in India and it is necessary to bridge them by new developments in the designs of bicycles, parts and components. As it is beyond the capabilities of the existing small-scale sector it is absolutely necessary to suitably restructure and strengthen the Research & Development Centre for Bicycles & Sewing Machines at Ludhiana.

Research & Development Centre for bicycles and sewing machines

The centre was set up in 1981 with the assistance of UNDP/UNIDO with the following main objectives:

- Design and develop new models of bicycles and pass on the know-how to the industry for commercial exploitation.
- Evolve testing and quality control procedures, which could be adopted by the industry and, thus enable it to produce contemporary and high quality models for domestic and export markets.

With UNDP assistance the centre was equipped well, but it has not been able to contribute much to technology upgradation of the industry and development of new models of cycles and parts. Whatever little R&D work was going on in the centre came to a standstill with the discontinuation of financial assistance from the Punjab Government. At present, the centre is only working as a production and testing unit and earning just enough to pay wages and salaries and other establishment expenses.

The quality of bicycles has to be improved and new models, comparable to international designs, introduced, to sustain the growth and further development of the bicycle

industry in the state and to increase its share of export. To achieve this objective the R&D centre should be restructured and strengthened possibly on the following lines:

- The bicycle industry should form a Federation of Bicycle Industry with the active participation of industry associations representing different segments.
- The state government should transfer the management, control, and assets of the R&D Centre to the Federation on the basis of a binding protocol.
- Future expenditure, recurring/non-recurring, to run the centre should be borne by the Federation. For this purpose a Bicycle Development fund may be created by levying a Development Cess of say two rupees per bicycle. Appropriate mechanism for collecting the cess may be evolved by the Central/State Government in consultation with the proposed Federation.
- A one-time grant may be provided by the Central/State Government or obtained from some international agency like UNDP through the good offices of the Government of India, to meet the financial requirements for upgradation of the R&D Centre.

The R&D Centre should work with the objectives of:

- Designing and developing new models comparable with the latest available in the international market and pass on the knowhow to the industry for commercial exploitation.
- Strengthening the testing and quality control labs to make available testing facilities for all types of bicycles and components.
- Upgrading of standardization and calibration facilities.
- Reinforcing the Documentation centre by making available latest literature and periodicals on domestic and international marketing information, new designs, manufacturing techniques and testing methods and international standards and specifications.

Human resource development and training

Training the workforce of the industry is necessary for upgrading their skills to adopt the latest manufacturing technologies, management techniques and quality management systems enabling them to compete in the international markets. Study visits to the developed countries should be conducted to give exposure to new developments taking place in the global arena.

Consortium/nodal agency

The trade associations related to bicycle and component industry should join hands and form a consortium/nodal agency to obtain the maximum advantage of partnership. This agency should work to for safeguard and promote the interests of the industry in domestic and international markets, for procuring raw materials at reasonable prices, dissemination of trade information and liaison with government, financial, and other developmental institutions.

A consortium approach may be adopted to reap the following benefits:

- Improve the bargaining strength in price negotiation, thus avoiding price cutting and undercutting by individual exporting units.

- Secure favourable terms of trade with regard to price, payment terms, etc.
- Popularize the common brand through effective marketing in the export market.
- Build strategic tie-ups, including joint ventures, with well-known international companies in the industry to tap growing and vibrant segments of markets in USA, Europe and other developed countries.
- Avail the advantage of marketing development assistance and other promotional policy measures of the government.

The mindset of the consumer has to undergo a sea change. Bicycle is considered a poor man's transport. Populations with higher income avoid riding a bicycle because it is a typical roadster model and does not suit their tastes and status. Under these conditions, there is not much demand from the higher income strata. The bicycle is made keeping in view the lower income group of the population that cannot afford higher prices. In trying to keep the price low, not much headway has been made in the design and look of the bicycle. The following steps could be taken to break the vicious circle:

- New fancy models should be developed and offered to the public for free test ride.
- Trade fairs and bicycle racing should be popularized.
- Enable the industry to have access to raw materials from international as well as domestic sources.
- Possibilities of providing locally produced raw materials at international prices can be pursued.
- Imports of raw materials can be made in economically viable bulk quantities.

Policy and institutional support

- More specialized SSI bank branches may be opened to provide financial assistance to the SSI sector.
- Finance should be made available at a reasonable cost, e.g., at a interest below or equal to prime lending rate (PLR).
- Financial evaluation procedures for lending should be made more objective and transparent and made public.

Reservation policy

The reservation policy for bicycle components and parts has played a major role in fostering the small and tiny sectors. Though serious doubts about its relevance have been raised, in the context of current national and international trends, after a series of meetings with industry associations and representatives, it is felt that the present policy of reservation should be continued for the time being. However, the investment limit of Rs. 1 crore could be enhanced to Rs. 5 crore in some selected and identified components to begin with, in order to:

- achieve higher quality standards;
- introduce new models in domestic and export markets;
- avail of economies of scale to face the new challenges under the emerging WTO regime; and
- introduce state of art technologies to attain higher levels of productivity and share of export market.

Cluster approach

After independence, Ludhiana and areas around it have emerged as a natural cluster for the bicycle industry, with medium, small and tiny industrial units, using traditional and modern techniques of production, but not well organized and systematic. These units are located in a haphazard manner causing considerable environmental degradation and other problems. Unless a systematic and planned cluster approach is followed, further development of the industry and even the present trend of growth will not be sustainable. Based on detailed discussions with government officials and industry associations concerned, it is suggested that the existing cluster should be strengthened with modifications. A common effluent treatment plant is absolutely necessary in the existing cluster, to provide a pollution-free environment. Better infrastructure facilities are essential for efficient material movement. The concept of 'flatted factory system' should be introduced in selected, planned areas, provide more industrial accommodation and factory space. For facilitating future growth the following specific suggestions deserve urgent follow-up:

- There should be an area exclusively allocated for the bicycle industry; to begin with 100 acres with provision for further extension.
- The units in residential areas should be relocated within this new cluster to check pollution in these areas and facilitate future growth.
- Concerted efforts are necessary by both Central and State Governments, industry associations and other agencies involved, with industry taking the lead, for developing the cluster.
- Central/State Governments may give one time grant for the development of the cluster.

The planned cluster will not only help remove the existing bottlenecks but also facilitate availing of the full benefits of government policy and available resources and facilities. The major benefits of the cluster could be:

- Taxes can be levied only at entry and exit points, thus enabling the free movement of goods within the cluster.
- Units located within the cluster can be linked through a computer network for better sharing and dissemination of information.
- Labour laws can be liberalized within the cluster.
- Time-and-work study can be conducted within the cluster for achieving higher levels of productivity and efficiency.
- The single-window clearance scheme can be better implemented.
- Access to finance to industry through banks and other financial institutions can be improved
- Promote partnership for HRD, technology upgradation, procurement of raw materials, common facility services in production and testing, and marketing of products in domestic and international markets.

AUTOMOBILE AND COMPONENTS INDUSTRY

With the increase in the motor vehicle population in the country during the 1980s, a large number of SSI units were established in Punjab to produce automobile components. These units have been catering to the needs of original equipment manufacturers (OEMs) and replacement markets. Of late, some units have also come up to serve the export market with improved technology and product quality and they have been able to export even to developed countries. The industry, which started as motor vehicle repair workshops, has come of age and is now a major foreign exchange earner.

The automobile industry in Punjab is mainly an auto-component industry. The total number of units has grown to 2,598 (with 2,569 in SSI and 29 in L&M) employing about 45,745 persons in 1999-2000. The total production in this sector has been valued at Rs.2,154.90 crore with an investment of Rs.1,128.03 crore growing at an annual average rate of 14.7 per cent and 8.4 per cent for production and investment respectively, during 1995-96 to 1999-00. Thus, the performance of this sector has been quite good. The status of the automobile and components industry is shown in Table 10.

Table 10
Status of Automobile and Components Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1995-1996	2269	27	2296	15432	25105	40537	5044	82359	87403	19569	108647	128216
1996-1997	2334	29	2363	15492	25929	41421	5764	89347	95111	22189	139802	161991
1997-1998	2451	31	2482	16727	25570	42297	6815	126957	133772	28064	122685	150749
1998-1999	2505	29	2534	17658	27285	44943	8310	115767	124077	29824	141565	171389
1999-2000	2569	29	2598	18281	27464	45745	9844	102959	112803	32647	182843	215490

Source: Director of Industries, Punjab

The capital-output ratio in the SSI sector has marginally increased from 0.26 in 1995-96 to 0.30 in 1999-2000, while in the L&M sector it has declined from 0.76 to 0.56.

Investment and production in the SSI sector per employee during 1995-96 to 1999-2000 increased from Rs. 0.33 lakh to 0.54 lakh and from Rs. 1.27 lakh to Rs. 1.79 lakh respectively. During the same period, investment and production per employee in the L&M sector increased from Rs. 3.28 lakh to Rs. 3.75 lakh and from Rs. 4.33 lakh to 6.66 lakh respectively.

Major destinations of auto components exports are Europe (36%), America (27%), Asia (16%), Africa (13%) and others (8%). The auto components industry has contributed significantly to exports as shown in Table 11.

Table 11
Export of Auto Components (Rs. in lakh)

Year	Value (FOB)	Change (%)
1994-1995	4419	
1996-1997	5436	23.01
1997-1998	8434	55.15
1998-1999	13862	64.36
1999-2000	14282	3.03
2000-2001	14415	0.93

Source: Director of Industries, Punjab

Auto-parts manufacturing units are spread over the whole state and most of them manufacture components required in the replacement market. The products presently manufactured in the industrial belts of Ludhiana, Jalandhar, Kapurthala and Ropar are metal-based. They range from such simple items as nuts and bolts to such complex items as axle, shafts and radiators. Managerial standards, engineering capability, machinery and quality control vary from poor to excellent, with most of the small-scale units showing engineering ingenuity and getting the best out of what they have and what they know.

Present technological status and observations

Among the auto-component manufacturers, there exists a three-tier structure. At tier-I are the original equipment manufacturers (OEM) and components manufactured by them go either directly into assembly lines or are exported. There are a few units in tier-I category and they are in the large and medium sector. Tier-II manufacturers supply sub-components to tier-I manufacturers as well as to the export market. Tier-III manufacturers produce low-cost, low value-added, low quality auto-component and mainly cater to the needs of the replacement market. Most of the component manufacturers in the large and medium sector and in the SSI sector fall in the tier-II category and tier-III category respectively.

Auto-components manufacturers in the SSI sector use conventional techniques of production and machinery, such as open die, old types of power presses, inefficient furnaces, old generation welding equipment, and locally made special purpose machines called 'Addas', etc. The processes are not carried out in sequence and based on scientific lines. Dies and other press tools are generally got manufactured from die makers lacking knowledge of designing and development techniques. Consumables, such as lubricants, welding electrodes and tools, etc., are selected on a random basis and no proper attention is given to the required grade. Without the latest designing facility, like CAD or OEM drawings of the components, most of the small-scale units merely produce components by copying samples. Small-scale units cannot achieve interchangeability as well as the required tolerances required by the replacement market. The majority of the units do not follow documented procedures of quality control. Components are not inspected at various stages of processing. Locally made inspection gauges are used, and there is no provision to calibrate them periodically. Small-scale entrepreneurs are not aware of various new methods and techniques, to either combat pollution or adopt alternative pollution-free processes. The low level of technologies in

use results in high cost, poor quality and low productivity and consequent competitive disadvantages.

Strategy for Development of Auto-component Industry

There is no doubt that the auto-component industry needs quality improvement and more market exposure. To achieve these objectives, technology upgradation, human resource development and training, effective innovative management techniques for producing zero-defect products, quality control and adopting the cluster approach for systematic and planned infrastructure development are necessary.

Technology upgradation

Wide gaps exist between technologies used by auto-component manufacturers in India and abroad. With MNCs setting up their shops in India, auto-component manufacturers should give serious thought to technology upgradation and quality control. It is well nigh impossible for SSI in Punjab to bridge this technological gap on their own, because they neither have the resources nor the capabilities. The Automobile R&D Centre at Ludhiana needs to be strengthened and its technological capabilities upgraded to provide guidance and support to the industry.

Suggestions to bridge the identified gaps

Product development: Hot forging requires to be replaced by cold forging techniques wherever possible and economical. An intermediate technology in the form of warm forging could also be introduced. The OEM drawings of components should be made available to small-scale units so that quality components within required tolerances and interchangeability are ensured.

Quality control: Units should adopt documented procedures for quality control, and inspection of components at various stages of processing should be introduced. Separate inspection cells/sections should be established in the units and their working should be made effective. The ultimate aim of Total Quality should be achieved through various quality control measures. The units should go for ISO-14000 Certification.

Pollution control: Entrepreneurs should be provided with information on various new techniques and technologies, which are eco-friendly and can combat pollution hazards. Small versions of economical and efficient systems of pollution-control devices and equipment should be made readily available in the market. The State Pollution Control Board should not only act as a regulatory body but also assist small-scale entrepreneurs to overcome problems faced by them in trying to control pollution.

Energy conservation: Economical versions of fuel-efficient designs of furnaces and other heating equipment could be made available to the entrepreneurs at reasonable prices, to achieve energy conservation. Power-efficient electric motors, lighting system, welding equipment, etc., should be introduced to small-scale industrialists.

Human resource development: Various institutions engaged in imparting training to industrial workers and supervisors and other managerial staff should be equipped on modern lines to cater to the special needs of the industry.

AGRO/FOOD PROCESSING INDUSTRY

Punjab is endowed with fertile land and a favourable climate to grow a large number of cereals, fruits and vegetables, oilseeds, pulses and maize and provides about 25 per cent of India's wheat production and approximately 10 per cent of rice production. The state has basic raw materials, manpower and a vast consumer market, which are the necessary prerequisites for industrial production. Value addition in agriculture is the answer to the wheat-paddy rotation, which has become one of the weak spots in the state's economy.

There is a huge domestic and export market for food products, but the consumer demands high quality food, both raw and processed, at affordable prices. Development of the agro/food processing sector can bring more employment opportunities, especially in the small towns and rural areas, and cheaper and better products to the consumers. Therefore, Punjab will have to look for alternative crops, which can increase revenues/returns to the farmers and have better scope for marketing/processing. This would be possible with research and development in specific crops to achieve desired quality/yield and supporting infrastructure.

Status and potential

The food-processing sector covers a wide spectrum of products and is one of the largest in terms of production, consumption, export and growth prospects. The vast potential of agricultural resources available in Punjab can be better exploited and utilized by preserving and processing, using available technologies. Though the Government of India has sanctioned a number of schemes, so far not much progress has been made towards setting up agro-based food processing industries, proportionate to the agriculture potentials and commodities available in the state. At present, the agro-processing industry is mainly limited to traditional processing of agricultural raw materials, such as atta chakkies, oil mills, cotton ginning and rice shelling, etc., using a basic, low-grade technology. There is little high-tech agro/food industry adding value to primary products. Only less than two per cent of the fruits and vegetables produced is processed, compared with 80 per cent in Malaysia. Therefore, there is scope for setting up a processing industry in the state, on a priority basis, using indigenous technologies as well as the latest technologies from abroad. The present status of the food and beverages industry in Punjab is shown in Table 12. Production has grown at an average rate of 15 per cent during 1995-96 to 1999-2000. The share of the food and beverages industry on 31 March 2000 was 18.66 per cent, the highest of the total production of the industrial sector in Punjab.

The capital-output ratio of the SSI sector has slightly improved from 0.22 in 1995-96 to 0.24 in 1999-2000; in the large and medium sector it initially improved from 0.46 to 0.51, but later declined in 1998-99 and, 1999-2000 to 0.41. The investment in the SSI sector per employee has increased from Rs. 0.58 lakh in 1995-96 to Rs. 0.9 lakh in 1999-2000, and production per increased from Rs. 2.61 lakh in 1995-96 to Rs. 3.67 lakh in 1999-2000. On the other hand, in the large and medium sector the investment per employee increased from Rs. 4.18 lakh in 1995-96 to Rs. 5.81 lakh in 1999-2000 and the production per employee from Rs. 9.01 lakh in 1995-96 to Rs. 14.12 lakh in 1999-2000.

Table 12
Status of Food & Beverages Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1995-1996	8972	103	9075	50872	33952	84824	29260	141899	171159	132527	305835	438362
1996-1997	9159	108	9267	52825	34855	87680	32829	164714	197543	154515	320804	475319
1997-1998	9301	114	9415	54318	35482	89800	37260	195533	232793	173856	405214	579070
1998-1999	9443	123	9566	56952	38165	95117	43941	220707	264648	192145	543721	735866
1999-2000	9644	121	9765	59950	37754	97704	53694	219445	273139	219750	533019	752769

Source: Director of Industries, Punjab

By using better techniques of farming, high yielding and hybrid seeds, agro-processing units could enhance farm income very substantially. Reports indicate that in the case of Pepsi Foods Limited, Hoshiarpur, the tomato yield increased by 200-266 per cent and income of farming increased by 230 per cent.

According to the assessment of Mckinsey (1997), packaged atta, packaged milk, fresh poultry, bakery, Indian dairy products and confectionery will grow faster with high volumes as these are mass-consumption items. The projected volume of business turnover in different categories of food processing industries, according to this study is given in Table 13.

Table 13
Projected Volume of Business Turnover of Agro-processing Industry in India (2005)

Sr. No.	Food category and sub category	Likely volume of business in 2005 (Rs. in crore)
1.	High volume & growth	
	(i) Packaged atta	15000
	(ii) Packaged milk	36000
	(iii) Fresh poultry	27000
	(iv) Bakery	10000
	(v) Tea & Coffee	7400
	(vi) Confectionery	6500
	(vii) Soft drinks	10500
	(viii) Processing meat & poultry	9000
(ix) Indian dairy products	7300	
2.	High growth & low volume	
	(i) Frozen vegetables	350
	(ii) Puree, jam, sauces	1000
	(iii) Fruit drinks	2000
	(iv) Fresh vegetables	1200
(v) Value-added dairy products	4700	
3.	Low growth & high volume	
	(i) Sugar	24000
	(ii) Oil	50000
Total		211950

Source: Mckinsey and Company (1997)

Technological gaps and suggestions for future development

Large gaps exist in the industry at different stages of operation, such as raw materials, technology and machinery, processing techniques, quality control and packaging. As already stated, most of the food processing units are in the small and tiny sector, using old inefficient, uneconomical machinery and technology and lacking infrastructure, because of financial and other constraints. At present, workers do not have basic ideas of food processing, and unskilled workers and supervisors work in the industry. Personal hygiene is also very poor in most cases. Training of floor level workers and their personal hygiene are essential to produce quality finished products. Quality control of raw materials and finished products is as important as processing. To compete in national and international markets, strict quality control of finished products is a must. Packaging is also one of the important aspects of the development of the food processing industry. The agro/food processing industry can be considered a sunrise industry and it has the potential of attracting local and foreign investments in Punjab.

To emerge as a leader in the agro-processing industry, a well thought-out, co-ordinated, growth-oriented, multipronged, strategy covering the following aspects could be considered:

- The role and responsibility of public sector undertakings in the agricultural sector should be thoroughly reviewed and appropriate structural changes made to render them effective instruments for promoting the agro/food-processing industry in the present situation.
- Agri-Export Zones (AEZs) and Parks should be set up product-wise, after examining their viability. This will facilitate building centralized, modern infrastructure. These facilities should be available to medium SSI/Tiny industries and farmers on a shared basis against reasonable cost. The private sector should be motivated to participate effectively in setting up the AEZs, with initial financial assistance from the Government of India and promotional support from the Punjab Government.
- Multinational companies (MNCs), should be attracted to invest in agro/ food processing industry in Punjab. This will facilitate upgradation of the entire infrastructure for achieving the benefits of large-scale vertical integration of different activities across the agro-business chain. This step is very vital for the growth of the agro/food processing industry in Punjab, in the emerging competitive markets for agro/food products.
- The state government should carefully examine the schemes of the Government of India for the promotion of agro/food processing and adopt and implement expeditiously only those which further and facilitate the achievements of its objectives.
- Keeping in view the growth potential of the agro/food processing industry, an Apex Review Committee, presided over by the chief minister, should review and monitor periodically the strategies and plans and projects in this sector.

TEXTILE AND HOSIERY INDUSTRY

Ludhiana is famous worldwide for its hosiery and knitting industry. The history of hosiery in Ludhiana can be traced back to 1902-1903, when the first unit manufacturing woollen socks was set up. During the years that followed this industry in Ludhiana progressed steadily. Till recent years our main trading partner for the export of hosiery knitwear, was the erstwhile USSR. However, after its disintegration, exports have diversified to other markets, viz., Europe, USA and other advanced countries. Production in the textile and hosiery industry in the Eighth FYP achieved an impressive average annual growth rate of 26 per cent. It, however, declined sharply during 1995-96 to 1999-2000 to 14 per cent in textile and 11.22 per cent in hosiery, as shown in Table 14:

Table 14
Status of Textile and Hosiery Industry in Punjab

Year	Textile/ Dying/ Weaving			Hosiery & Garments			Grand Total
	SSI	L&M	Total	L&M	SSI	Total	
Units							
1995-1996	635	56	691	54	12760	12814	13505
1996-1997	653	69	722	73	13068	13141	13863
1997-1998	673	79	752	79	13311	13390	14142
1998-1999	696	87	783	67	13486	13553	14336
1999-2000	715	108	823	68	13665	13733	14556
Employment							
1995-1996	4119	48455	52574	24744	89884	114628	167202
1996-1997	4397	55347	59744	23652	91945	115597	175341
1997-1998	4909	55761	60670	21679	93600	115279	175949
1998-1999	5327	57180	62507	18684	96537	115221	177728
1999-2000	5719	67535	73254	18618	98465	117083	190337
Investment		(Rs. lakh)					
1995-1996	2194	182524	184718	74565	15970	90535	275253
1996-1997	2620	237904	240524	79029	17678	96707	337231
1997-1998	3827	266879	270706	95923	19657	115580	386286
1998-1999	6089	319088	325177	151957	26157	178114	503291
1999-2000	7578	328617	336195	162272	30239	192511	528706
Production		(Rs. lakh)					
1995-1996	11234	212495	223729	103264	96758	200022	423751
1996-1997	12953	298970	311923	125861	107401	233262	545185
1997-1998	19846	322782	342628	152897	121243	274140	616768
1998-1999	21927	355536	377463	145299	135818	281117	658580
1999-2000	24840	340008	364848	148063	156062	304125	668973

Source: Director of Industries Punjab.

During 1995-96 to 1999-2000 the capital-output ratio of the SSI and the L&M sectors in the textile industry increased from 0.20 to 0.31 and from 0.86 to 0.97 respectively. In the hosiery industry during the same period it increased from 0.17 to 0.19 and from 0.72 to 1.10 respectively, as shown in Table 14. Investment per employee in the SSI and the L&M sectors in the textile industry increased from Rs. 0.53 lakh to Rs. 1.33 lakh and

from Rs. 3.77 lakh to Rs. 4.87 lakh respectively and in the hosiery industry from 0.18 lakh to 0.31 lakh and from Rs. 3.01 lakh to Rs. 8.72 lakh respectively.

Table 15
Consolidated Data for the Textile and Hosiery Industry

Year	Units (No.)			Employment (No.)			Investment (lakh)			Production (lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1995-1996	13395	110	13505	94003	73199	167202	18164	257089	275253	107992	315759	423751
1996-1997	13721	142	13863	96342	78999	175341	20298	316933	337231	120354	424831	545185
1997-1998	13984	158	14142	98509	77440	175949	23484	362802	386286	141089	475679	616768
1998-1999	14182	154	14336	101864	75864	177728	32246	471045	503291	157745	500835	658580
1999-2000	14380	176	14556	104184	86153	190337	37817	490889	528706	180902	488071	668973

Source: Director of Industries Punjab.

The capital output ratio of the SSI and the L&M sectors increased from 0.17 to 0.21 and from 0.81 to 1.01 respectively as shown in Table 15 during 1995-96 to 1999-2000. Investment per employee in the SSI sector nearly doubled from Rs. 0.19 lakh to Rs. 0.36 lakh while in the L&M sector it increased from Rs. 3.51 lakh to Rs. 5.70 lakh during 1995-96 to 1999-2000. Production per employee in the SSI sector increased from Rs. 1.15 lakh to Rs. 1.74 lakh and in the L&M sector from Rs. 4.31 lakh to Rs. 5.67 lakh.

Table 16
Annual Average (Linear) Growth Rate of Textile and Hosiery Industry during Eighth FYP and 1996-00 (%)

Year	Units		Employment		Investment		Production	
	SSI	L&M	SSI	L&M	SSI	L&M	SSI	L&M
Eighth Plan	4.41	17.96	3.08	5.34	12.00	26.48	28.84	26.04
1996-2000	1.79	13.03	2.61	4.37	17.95	20.51	13.79	12.31

Source: Based on data from Director of Industries Punjab.

As shown in Table 16, there has been a decline in the number of industrial units, employment and production in 1995-96 to 1999-2000 compared with the Eighth FYP.

Exports

Table 17
Exports of Textile and Hosiery Industry

Year	Exports (Rs. lakh)	Change (%)
1997-1998	141519	
1998-1999	139820	-1.20
1999-2000	156785	12.13
2000-2001	153120	-2.34

Source: Director of Industries, Punjab

Status of the industry: some observations

The textile and hosiery industry in Punjab can be classified into two groups, viz., hosiery & readymade garments and textiles. The hosiery and readymade garments industry is highly labour-intensive. There exists a 'technological dualism' in this industry as, on the one hand, it uses state-of-the-art technology, manufacturing high value-added fashion

garments and on the other, it relies on conventional, locally manufactured and fabricated machinery and equipment, well suited to the capabilities of the untrained and illiterate labour force. Yarn is the basic raw material for textile, hosiery and readymade garments. Proper blended yarn of requisite quality is not available at a reasonable price. The dyeing processes at present are highly energy consuming, inefficient and polluting and in-house testing facilities for colour-matching and colour-fastness are not available in most of the units. Designs normally are copies from magazines, journals, or samples provided by the buyers. The majority of the units have not adopted Computer Aided Designing/ Manufacturing.

Machinery being used in the industry are flat-bed machines, circular knitting machines and imported reconditioned knitting machines. To cater to the requirements of western countries, it is essential to improve the technology not only to manufacture hosiery products, but also the basic machinery. Emphasis should be more and more on the use of computerized machinery and equipment. The industry is still not using laser and other modern techniques for cutting the fabric. Knitwear is stitched on multi-thread lock-stitch, chain-lock, flat-lock and over-lock machines, either manufactured indigenously or imported. Embroidery, patchwork, printing and beadwork are done with indigenous machinery and the quality of embroidery is not acceptable in the international market. However, some of the progressive units have imported computerized multi-head embroidery machines, which can create intricate logos on T-Shirts and other garments. Latest models of modern machinery and equipment in use in developed and other developing countries for producing yarns of new blends, ready to use yarn, knitting fabric, cutting and stitching knitwear, dyeing and finishing the and products, and CAD/CAM facilities must be introduced in our country.

As the Hosiery and Knitwear Facility has closed down there is no institute or agency, which is involved in research and development in hosiery and knitwear in the state, to develop low-cost hybrid technologies. The industry is in need of such a facility, which would develop and transfer technologies to the units.

Strategy for the development of hosiery and textile industry

Human resource development: With the addition of the latest models of machinery and equipment, the industry needs a trained workforce to handle these efficiently and effectively. There is no training centre to impart training on electronic gadgets and systems, computer-aided designing and manufacturing, handling of testing equipments, etc. Apart from these technical training facilities, the industry also needs specialized trained professionals in different managerial, marketing, and financial areas, to make the units sustainable and internationally competitive.

Textile park: Textile parks with ultra-modern facilities are required to be developed near Ludhiana for hosiery and knitted garment units. The layout of the complex should be such that dyeing and processing units are clubbed together, so that a Common Effluent Treatment Plant is feasible. Provisions should also be made for setting up on R & D Centre, Testing and Training Centres, Exhibition hall, Auditorium, Telecommunication, etc.

Air cargo facilities at Ludhiana: Facilities for Air Cargo Services in or around Ludhiana would facilitate exports.

Research and development centre: An exclusive Centre for Research & Development for hosiery and knitted garments, to develop appropriate modern technologies and processes is required at Ludhiana. It should have modern facilities backed by well-known specialists and experts in the field, with a separate wing for imparting training to workers and intermediate-level management personnel. Regular courses at the degree and post-graduate level should also be undertaken. The Centre should act as a show-window of modern technology, by installing various machinery and equipment. The land, building and equipment of the defunct common facility set up by the state government could be transferred to the Association of Hosiery and Knitwear Industry, which should take on the responsibility of establishing and running the new facility. An appropriate institutional mechanism should be evolved for this purpose through consultation between the Central and State Governments and the Associations concerned.

National institute for fashion technology: A full fledged Institute of Fashion Technology, on the pattern of such Institutes at New Delhi, Hyderabad, Tirupur, Kolkata and Mumbai, should be established at Ludhiana to train professionals in designing, marketing, quality control and manufacturing of knitwear. The institute could help in creating awareness among the local entrepreneurs by organizing exhibitions, fashion shows, seminars, etc. The management of this institute too should be with the Association of Industry defined by a protocol with the State/Central Governments.

Visits of foreign experts: The Government of India should invite experts on spinning, dyeing, processing, knitting, finishing and manufacturing of garments from developed and other developing countries, to enlighten small-scale entrepreneurs about appropriate technologies and processes, on the basis of study of the existing set-up of the units during their stay. This will help in creating confidence among the entrepreneurs in making their units sustainable and competitive in the international market. The proposed Institute could co-ordinate this activity.

Development of economical models of modern machines: Machine building facilities and capabilities within the country should be upgraded and updated, either through foreign collaborations or by assigning special projects to various institutes engaged in R & D, such as MERADO, (Ludhiana) and CMTI (Bangalore). Creation of such facilities would not only help in developing the hosiery and readymade garments manufacturing units, but would also save foreign exchange, as well as earn it through export.

Financial assistance: For modernization and technology upgradation of the cluster, it is essential in this era of stiff competition to provide finance at rates of interest comparable with internationally prevailing interest rates. This will help the small-scale units to purchase modern machinery and components required to produce products of acceptable quality. This will encourage more and more small-scale units to enter the international market, thus boosting India's share in world trade. The state government should take up the matter with the Central Government and the Reserve Bank of India.

Development and transfer of dyeing and processing technology: The IITs/universities in the country, having textile technology as a branch of study, should be entrusted with special projects for developing and transferring eco-friendly, lesser energy- and water-consuming technology for wet dyeing of yarn/fabric.

Common brand: The hosiery and knitwear manufacturing industry at Ludhiana can not compete with the multinational companies in the quantum of production, types, styles,

designs and quality of products. Some tie-ups with some of the larger established brands for manufacturing as well as marketing in the international market are essential for increasing India's share of foreign trade in this area.

BASIC METAL INDUSTRY

The basic metal industry is acclaimed as the mother of all industries. Before independence there were some restrictions on setting up the iron and steel industry and, therefore, very few units were engaged in the manufacture of basic metals. These units were mainly concentrated in the erstwhile princely states of Nabha, Patiala, and Faridkot. These states offered many incentives, such as tax holiday and free land, to promote industry within their respective territories. After independence, overall industrial growth in Punjab led to the development of the steel industry as backward-linkage efforts. The industry, which started with the manufacture of bars and rods and small smith shops, graduated to the manufacture of forging items, castings for machine tools, girders, heavy channels and joints of different compositions. This impressive growth despite Punjab's distance from coal mines, steel producing areas and ports was due to such factors as availability of cheap and good quality power, entrepreneurship and incentives given by government such as freight equalization.

Major constituents of the basic metal industry are casting, forging, melting and re-rolling. The present status of the industry is shown in Table 18.

Table 18
Status of Basic Metal Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (lakh)			Production (lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1980-1981	2232	26	2258	19588	8837	28425	4452	4886	9338	12887	11692	24579
1985-1986	3101	33	3134	25902	10131	36033	8247	11881	20128	21832	30574	52406
1990-1991	4086	51	4137	33442	14729	48171	12603	22457	35060	48904	91874	140778
1995-1996	5093	95	5188	45093	18387	63480	217.64	675.33	892.97	1373.09	2718.07	4091.16
1996-1997	5227	105	5332	47280	18683	65963	25070	76974	102044	163353	281346	444699
1997-1998	5349	105	5454	49410	18207	67617	29964	70837	100801	197929	442597	640526
1998-1999	5462	93	5555	51902	16942	68844	35723	78205	113928	213184	228951	442135
1999-2000	5568	77	5645	54468	15369	69837	41262	78596	119858	270937	206593	477530

Source: Directorate of Industry Punjab

The capital-output ratio in the basic metal industry is 0.25 with 0.15 in the SSI sector and 0.38 in the L&M sector. The investment required to generate one unit of employment is Rs. 75,000 and rupees five lakh in the SSI and L&M sectors respectively. The L&M sector, with an average share of 70 per cent and 58 per cent in investment and production, has been leading over the SSI sector in the basic metal industry in Punjab, for the last four years (1996-97 to 1999-2000). However the SSI units employ 75 per cent of total workforce in the basic metal industry.

Melting and re-rolling industry

Re-rolling is one of the most important segments of the iron and steel industry, constituting an essential link in its supply chain. The rolling and re-rolling mills cluster in Punjab is located at Mandi Gobindgarh and adjoining areas. Mandi Gobindgarh is rightly called the Steel Town of Punjab. About 275 rolling and re-rolling mills, five arc furnaces and 100 induction furnaces are in operation in Punjab. The steel melting and re-rolling sector consists of small and medium scale units producing several thousand tonnes annually of different types of structurals, rods, plates, flats, etc.

Technological status and gaps

Various sizes and types of re-rolling mills and induction furnaces are in operation. Machines and furnaces are indigenously designed and manufactured. Sizes of induction furnaces vary from two tonnes to 12 tonnes per charge. These furnaces produce mild steel of structural quality at a competitive cost and as per BIS standards. Generally, rolling mills operate at slow speeds, though a few units have established medium-speed rolling mills. Some units have adopted automation to perform certain difficult and hazardous operations and these semi-automatic rolling mills are more efficient and produce better quality products. Almost all types of sections of various sizes in different compositions are being manufactured in Punjab, contributing about 25 per cent of the total production of rolled steel products in India.

Consumption of oil and coal per metric tonne of steel is much higher than international standard, as the industry uses 45-60 litres of oil compared to 25-30 litres internationally. Cost of fuel alone accounts for about 30 per cent of the total cost of production. Therefore, the main emphasis should be on energy conservation as a cost saving measure. Scrap is the basic raw material for the melting and re-rolling industry. It comes from different sources, such as ship-breaking, steel plants, imports and local scrap dealers. Scrap coming from steel plants and ship-breaking is of good quality. Local as well as imported scrap are not so. Though induction furnaces undertake limited refining, the end products are not of good quality.

The roll passes are designed purely on the basis of the practical experience of the foreman of the mill, who is generally not well qualified and well conversant with requirements of grades of rolling materials, pressures, speeds and reductions, etc. Faulty roll-pass design results in frequent breakdown of machinery, poor quality of finished goods and wastage of energy. Average capacity utilization of Punjab's re-rolling industry is about 37 per cent of the total installed capacity, with many mills not even breaking even. This is mainly due to the obsolete technology and consumption of expensive energy.

The major problems of the industry are lack of technical knowledge and awareness of energy-efficient and environmentally sound technologies, as well as practices that have been introduced successfully across the globe. The means of transforming this knowledge and awareness into an operational framework is also lacking because of:

- Low and asymmetric information base which has limited the size of the technology market.
- Low engineering, technology, innovation and R&D base.
- Low level of human resources development.
- Dominance of technical and financial risks in the minds of decision makers.

Re-rolling mills do not often adopt quality control measures and normally they keep control only over dimensional accuracy. Very few re-rolling mills have BIS certification. Units of induction furnaces possess good laboratories and some of them even have the latest instruments like spectrometers.

Apart from general trade practices and finance schemes of banks, the industry has evolved a unique finance system of its own to meet its working capital needs. A third party finances the deal between the induction furnace owner and the re-roller. He pays instantly to the furnace owners and charges a premium of a certain fixed amount per tonne for a specified period from the re-roller. The re-roller repays the amount to the third party on a specified date. If he is unable to pay back the financier within the stipulated period, the financier charges higher premium for subsequent next period. This system is reportedly working well as, the seller receives the payments immediately and the re-roller is able to procure raw materials to run his industry.

Suggestions for technological upgradation

- The industry should use liquefied natural gas as fuel, as it has many advantages over coal and oil, which are now in use. LNG is environment friendly, has more calorific value and is cheaper than oil.
- Pilot projects, using continuous processes, having both induction furnace and re-rolling mill should be set up, where preheated scrap could be charged to induction furnace. The plant will not only conserve energy, but also help in providing better quality products.
- Regular workshops/seminars, with the participation of technology suppliers, equipment manufacturers and consultants, will help the industry by providing exposure to new technologies.
- Training operators in operation and maintenance of new systems should be organized.
- Support to provide back-up services and update the technology from time-to-time with R&D inputs, should be ensured.
- Adoption of new technology by a large number of units/markets will depend on information-base and technology dissemination.
- Technical and financial risks involved in the introduction of new technologies have to be assessed by the industry in consultation with experts.
- Software to be developed for roll-pass design and computerized fluid dynamics (CFD) for each unit with institutional back-up for development, installation, training, etc., at the shop floor.
- Market has to be provided intelligence on input material and finished products to help the units to plan their inventory and improve the flow of material.

Status of forging industry

Expansion of road transport, the green revolution and the development of steel making and light engineering industry in the state gave a boost to the forging industry. More than 90 per cent of the forging units are located in Ludhiana and Jalandhar and the remaining in Mandi Gobindgarh, Phagwara, Mohali, Amritsar, etc. The forging industry in the state may be categorised in order of merit into various segments and dispersal thereof at different locations, as indicated below:

Segments	Location
Nuts, Bolts and Screw	Ludhiana, Jalandhar, Mohali, Amritsar
Hand tools and garden tools	Jalandhar, Ludhiana
Bicycle & sewing machine parts	Ludhiana
Auto-parts	Ludhiana, Jalandhar, Phagwara
Tractor parts, Diesel engine parts	Ludhiana, Phagwara
General forgings	Ludhiana, Mandi Gobindgarh.

Status of technology and upgradation

The forging industry mainly employs hot-forging techniques. Nuts, bolts, screws and similar items upto certain specified sizes are manufactured by the cold-forging process. Some of the progressive units employ warm-forging technology for producing B.B. Axles and allied cycle products.

Hot-forging techniques in general are of a primitive nature, where machinery and equipment in use date back to the fifties or sixties. The technology in practice is both labour- as well as energy- intensive and is dependent on the skill of the persons involved. However, a trend has emerged during the past couple of years to import and install second-hand multi-station horizontal forging machines.

Oil-fired furnaces used for heating and heat treatment are of non-standard specifications and design and are not fuel-efficient. The tools and die-making facilities in the units are very poor. Products forged through poorly designed and manufactured dies are of sub-standard quality.

More than 90 per cent of the units do not have adequate in-house material-testing facilities. The majority of the machinery and equipment in use in the forging industry are manufactured by the small-scale machinery manufacturers located at Ludhiana and other places in the state. Modern accessories and gadgets are nor available for these machines. Recent additions of imported Knuckle-joint type power presses, Multi-station Horizontal Forging Machines, etc., though second-hand, have brought in new vistas of awareness in the industry.

Provisions for designing of press tools and forging dies are totally missing. These are traditionally developed under the guidance of foremen by the tool-room people without precision measuring instruments. Recently, some progressive manufacturers have started applying CAD/CAM to forging. The conventional process of designing the formed products by the 'build-and-test' method is no longer cost-effective in today's global competitive market. The only way to reduce the 'design-to-build' time and optimize the process is to resort to computer-based product and process design.

Human resource development

The basic metal industry is critically dependent on a skilled work-force, but there is a dearth of technically trained manpower. Though some of the units have engaged better qualified personnel, trained from various institutes, the majority of the labourforce on the shop floor is employed on a contract basis. They are often not concerned about wastage

and quality of products and conserving various inputs. There are many institutions imparting technical training at various levels in the state. However, these training courses need to be revised and upgraded according to latest developments in the industry.

METAL PRODUCTS INDUSTRY

The metal products industry transforms basic metals into more useful products, such as conversion of metal sheets into trunks and almirahs, and pipes into steel furniture. Similarly, it also produces such industrial products as nuts and bolts and hand tools, etc. The metal products industry is concentrated in Amritsar, Jalandhar, Ludhiana and Kapurthala, though fabrication units are spread all over the state. Tables 19 and 20 depict the status and growth of the industry in Punjab. Production in the Eighth FYP achieved quite a good annual average growth rate of 21.27 per cent, but declined in the first three years of the Ninth FYP to 12.21 per cent. The employment growth rate also declined from 2.43 per cent to 1.79 per cent during the same period as shown in Tables 19 and 20.

Table 19
Status of Metal Products Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1980-1981	7854	14	7868	43917	3574	47491	4168	827	4995	10505	1577	12082
1985-1986	12656	14	12670	66081	3119	69200	9035	816	9851	18292	2454	20746
1992-1993	18165	15	18180	85859	3335	89194	17276	1700	18976	45014	5293	50307
1995-1996	19651	12	19663	93077	3180	96257	22248	1869	24117	86396	8518	94914
1996-1997	19870	15	19885	95194	2938	98132	24736	3261	27997	97244	9954	107198
1997-1998	20094	16	20110	96789	2981	99770	27118	4544	31662	116727	11080	127807
1998-1999	20339	12	20351	98825	2945	101770	29462	6169	35631	125292	11252	136544
1999-2000	20569	10	20579	100973	2532	103505	33434	6031	39465	139985	10973	150958

Source: Director of Industries Punjab.

Table 20
Annual Average (Linear) Growth Rate of Metal Products Industry during 1997-00 (%)

Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1.16	-11.67	1.15	1.98	-4.59	1.79	10.59	24.29	12.13	13.03	3.46	12.21

Source: Based on data, Director of Industries Punjab.

The capital-output ratio in the SSI sector declined marginally during 1996-97 to 1999-2000, while in the large and medium sector it increased from 0.33 to 0.55 as shown in Table 19. Investment per employee in SSI and the large and medium sectors increased from Rs. 0.26 lakh to Rs. 0.33 lakh and from Rs. 1.11 lakh to Rs. 2.38 lakh respectively

during 1996-97 to 1999-00. During the same period production per employee in SSI and large and medium sectors increased from Rs. 1.02 lakh to Rs. 1.39 lakh and from Rs. 3.39 lakh to Rs. 4.33 lakh respectively.

Hand tools

The term 'hand tool' is generally applied to tools used by hand. These are quite small-sized tools, but are essential for erection and maintenance of plants, machinery and equipment. The use of hand tools covers almost all types of industries, viz., engineering, electrical and electronics, construction, plumbing, etc.; different types of servicing industries; and also certain types of production processes irrespective of their sizes and scales of operations (i.e., small, medium or large). Absence of these tools would in fact paralyse every type of industrial activity. Hand tools most commonly used in industries are wrenches, hand drills, pullers, vices, hammers, screwdrivers, pliers, spanners, clamps, cramps, etc. Such hand tools, as flaring tools, pullers, ring expanders and compressors, screw and stud extractors, tyre valve pull-out tools, flanging tools, valve lifters and reseating tools, etc., are extensively used in automobile repair workshops and garages. They also have important applications in the household sector in day to day life.

Growth and present status

The hand tools industry is concentrated in Jalandhar and Ludhiana. With the partition of the country in 1947, there was a large-scale influx of people, including industrialists and artisans, from West Pakistan. Some of them started small manufacturing units for their survival. Certain incentives given by government helped these people to rehabilitate themselves and set up their industries. Owing to acute shortage of foreign exchange and consequent restrictions on the import of various items, including hand tools, the domestic hand tools industry got a comparative advantage in the home market. This, together with increased effective demand in this sector, led to induced investment. In such conducive economic conditions, the hand tools industry of Punjab grew rapidly. The freight equalization scheme of the Central Government, took care of the locational disadvantage of the state of being far away from sources of raw materials, such as iron, steel and coal, and gave a big push to the hand tools industry. The natural dynamism of Punjabi entrepreneurs helped it capture markets not only in the county but also abroad. The product mix and product range availability in Jalandhar is quite extensive and exhaustive compared to other areas of concentration. The industry in the small-scale sector, by adopting a lower-level and labour-intensive technology provides employment to thousands of people in the state. Details of industrial growth, employment, production and investment from the year 1980-81 onwards are given in Table 21.

Table 21
Growth of Hand Tools Industry in Punjab

Year	No. of Units	Employment (Nos.)	Investment (Rs. lakh.)	Production (Rs. lakh.)
1980-1981	569	6042	1022.44	2469.24
1995-1996	1058	9906	2912.51	29187.12
1998-1999	1158	10733	4049.12	43761.12
1999-2000	1178	11169	4259.16	44911.82

Source: Director of Industries Punjab.

The SSI hand tools manufacturing units of Punjab contribute about 30 per cent of the total exports of the country. There is good scope to increase exports further provided the design, quality and packaging of hand tools are improved. Export figures for the years 1997-98 to 2000-01 are as shown in Table 22.

Table 22
Exports of Hand Tools from Punjab

Year	Export (Rs. lakh)	Percentage change
1997-1998	28417	
1998-1999	22917	-19.35
1999-2000	26872	17.26
2000-2001	24059	-10.47

Source: Director of Industries, Punjab

Technological gaps and strategy to overcome them

Production of forged hand tools by drop forging hammers, presently adopted by the local units, has the inherent disadvantage of high flash generation. To overcome this serious process, draw-back combination of forging techniques can be used, such as special purpose machines based on the principles of chipless forging and zero machining, cold/ warm/ hot forging automatic formers, multi-station transfer presses.

The present process of heating raw materials in oil-fired furnaces is not only slow, but also polluting. This can be performed by the induction heating process, which is environment friendly, reduces scale and results in faster production; shot blasting and barrel rolling machines may be used to clean the forgings/castings. Use of a modern packaging system is necessary to survive in global competition.

Facilities for manufacturing forging tools and dies in the units are very poor. The quality of the forged products depends on the die impression. Products forged through poorly designed and manufactured dies will be of sub-standard quality. Tool rooms equipped with latest die-making precision machines have to be set up by the units, to improve the surface finish and obtain required contours of the forgings. Large investments in R&D activities and CAD/CAM techniques are needed for improved designing and manufacturing of hand tools.

Different grades of steel, i.e., EN-8, EN-9, carbon steel, alloy steels, etc., are used as raw materials, but Indian raw materials are often not comparable with imported ones in quality standards. Development efforts are required for making steels needed for hand tools, having cold- and warm-forging characteristics with adjustment in composition.

Human resource development and training

The hand tools industry in Punjab is skill-intensive and facing scarcity of technically qualified and trained manpower. The root cause of this sad state of affairs lies in the system of the contractual labour-management relationship. The labour and the majority of the supervisory staff are employed on a contract basis making weaning away of labour easier by offering small increments in wages by unscrupulous competitors. This perpetuates a high labour turnover and makes labour unconcerned about wastage of materials, product quality deterioration and conserving various other inputs. Contractual labour is more concerned about high tonnage of production. The high labour turnover discourages individual initiatives to impart skill-development training to hand tools workers.

During the recent past, some units have employed trained persons from the Central Tool Room (CTR), Ludhiana, and the Central Institute of Hand Tools (CIHT), Jalandhar. There is still a supply-lag of technically qualified and trained manpower. Specialized and need-based short-term courses for training of the workforce at different levels are required to bridge the gap. The CTR, Ludhiana and CIHT, Jalandhar could play a major role in this area. The industry also needs qualified professionals in designing, overseas marketing and financial management to make the units competitive in national/international markets.

Labour laws

The labour laws are generally in favour of labour and cause many practical problems for the employers. They need to be reviewed and amended in the interests of both labour and management. This is urgently necessary to gear up the industry for global competition, and government has to take the initiative.

Research and Development Centre

The Ministry of Industry under UNDP set up the Central Institute of Hand Tools in the early eighties at Jalandhar. During the last one and half decade, this institute has been working for the development of the hand tools industry in Punjab by developing new designs for hand tools as well as modern manufacturing processes. Now the industry badly needs technology upgradation to work manufacture modern hand tools to enable it compete in the global market. Therefore, this centre has to be adequately equipped and its facilities upgraded to provide specialized training for designing, quality control and manufacturing.

Cost of bank finance is a significant factor in export pricing. This becomes more crucial for such highly competitive products as hand tools. Since we have to integrate with the global market in the WTO regime, rates of interest, particularly for export, should be brought in line with international rates, which are reported to be five to six per cent. Timely and adequate availability of finance, particularly to the small-scale sector, is a must for growth. Study visits of entrepreneurs in the SSI sector to various technically advanced units both in India and developed countries, along with technical experts in the trade, to make them aware of prevailing technologies and manufacturing techniques, will be very productive.

MACHINERY OTHER THAN ELECTRICAL INDUSTRY

The machinery manufacturing industry plays a significant role in the industrial development of every country, since the quality, accuracy and durability of components, parts and industrial and consumer products, depend to a large extent on the quality of the machinery used for their production.

The machinery making industry of Punjab has played a very significant role in the industrial development of the country. This is particularly true of the small-scale sector of the state engaged in the production of machines for the manufacture of a variety of industrial products. This industry includes diesel engines, tractors, oil expellers, textile machinery, centrifugal pumps, machine tools, sewing machines and their parts. As shown in Tables 23 and 24, production in the Eighth FYP achieved an impressive annual average growth rate of 28.27 per cent, while it declined in the first three years of the Ninth FYP to 17.35 per cent. During the same period the employment growth rate slightly declined from 2.32 per cent to 2.29 per cent. However, the employment growth rate was quite high in the Sixth and Seventh FYPs.

Table 23
Status of Machinery Other than Electrical Industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1980-1981	4336	11	4347	25286	4421	29707	4520	3097	7617	10587	6164	16751
1985-1986	6874	11	6885	37248	3587	40835	7558	1730	9288	15721	8774	24495
1992-1993	9379	7	9386	54111	3675	57786	12468	8135	20603	30016	28761	58777
1996-1997	10084	12	10096	58334	4972	63306	16889	20005	36894	59127	91069	150196
1997-1998	10263	9	10272	59851	5620	65471	18983	44698	63681	68451	137065	205516
1998-1999	10490	10	10500	62024	6495	68519	22951	60066	83017	77784	192133	269917
1999-2000	10636	8	10644	62937	4754	67691	24500	28643	53143	84424	141991	226415

Source: Director of Industries Punjab.

The capital-output ratio of the SSI sector has remained the same during the 1996-97 to 1999-2000 as shown in Table 23, while in the large and medium sector it initially increased from 0.22 to 0.3, but came to the same level in 1999-2000 as in 1996-97. Investment per employee in SSI and large and medium sectors increased from Rs. 0.29 lakh to 0.39 lakh and from Rs. 4.02 lakh to 6.03 lakh respectively during 1996-97 to 1999-2000, while production per employee in SSI and large and medium sectors increased from Rs. 1.01 lakh to 1.34 lakh and Rs. 18.32 lakh to Rs. 29.87 lakh respectively.

Table 24
Annual Average (Linear) Growth Rate of Machinery Other than Electrical Industry during 1997-00 (%)

Units (No.)			Employment (No.)			Investment			Production		
SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1.79	-11.30	1.78	2.57	0.60	2.29	13.35	35.17	22.33	12.65	21.53	17.35

Source: Director of Industries Punjab.

The machine tools industry in Punjab, with an annual output of more than Rs. 250 crore is mainly concentrated in Batala and Ludhiana, and produces a variety of machine tools of different sizes and types, such as lathes, shapers, milling machines and drilling machines, special purpose machines for different industries. Machine tools worth Rs. 80 crore are being exported annually from Punjab.

Technological gaps and suggestions for upgradation

Technology gaps exist in the following areas:

- Conventional general-purpose flat-bed lathe machines being manufactured are like those manufactured by developed countries 50 years ago. There has not been much progress in improving the designs of the machines. On the other hand, machine tool designs are continuously updated with the use of Computer Aided Design and Finite Element Analysis in developed nations.
- Spindle speeds are in the range of 5,000 rpm and not much automation has been adopted.
- Whereas in modern machines, spindle speeds up to 30,000 rpm and in some cases up to 1,60,000 RPM have been achieved, use of automatic tool changers and pallet changers, make the machines more productive. Feed rate of 0-5,000 mm/minutes and rapid traverse rates can be 9,000 to 12,000 mm/minute achieved. Accuracy is seldom claimed by manufacturers or demanded by customers locally. Accuracy is very high in developed nations and will have to be achieved in the coming WTO regime.
- The machine operator makes himself and the work-place dirty. Chip conveyor systems are not used to clean the machines. Leakage from the hydraulic system and absence of dust extraction systems in wood-working machines lead to more noise and dust. At the same time safety features are mostly absent or crude. Safety is not built into designs. Much needed electronic safety guards are not used in mechanical presses/metal forming machines.
- Conventional material, such as graded C.I., are mostly without any quality control. Advanced materials, such as C.I. by potential mehanite process and polymer concrete, granite and other patented materials to make them thermally stable, vibration free, more accurate and ensure longer tool life, are not in use.
- Conventional measuring instruments, such as vernier calipers, micrometers, dial indicators, etc., are used. The laser calibration system for inspection of machine tools, roundness checking, and surface roughness checking machines to evaluate accuracy of machine tools parts, are not used.
- Flame hardening of guide-ways, grinding of slide-ways of lathe, use of patented turret material to reduce friction in slide-ways and AC servo motor, CNC control, are not used by our machine tools industry. Advanced designs, such as machine vision system of work-holding to ensure accuracy and reliability, have yet to be developed.
- Conventional machining, such as drilling, turning, grinding, polishing and pressing is in use. Modern machining methods, such as laser machining, aqua jet machining, plasma cutting, etc., developed for greater accuracy and productivity are not available.
- Much time is wasted in setting up and operating machines, as most of the operations are manual. Set-up time can be reduced by putting up operation

- panels within easy reach of the operator, by clearly designating interference-free work area, and by direct mounting of tools into the turret face.
- Modern machine tools with specialized attachments, such as automatic tool changer, automatic pallet changer, pneumatic feeders, electronic safety guards to improve speed and productivity of machine tools, are not manufactured.
 - Advanced design concepts, such as moving column design, moving head stock swing beam principle, hydraulic tool clamping, hydraulic hold down system in shears, flying optics principle in laser cutting machines, etc., to improve accuracy, safety and speed of the machine tools, are not employed in our machine tools industry.
 - Upgradation of technologies in use and human resource development and training on a continuing basis are essential for the growth of this segment of industry.

ELECTRONICS INDUSTRY

The evolution of technology has led to increasing use of electronics in a variety of applications. Today, the electronics hardware industry spans a whole gamut of products and the entire spectrum of the value chain. Newer applications and better ways of doing things are fuelling growth. Electronics gadgets and tools are being used in India too in a large range of applications and fast catching up with the world in terms of penetration. This can lead to an enormous domestic demand for these products, giving the necessary critical mass for global competitiveness. Such a base will also be a stabilizing factor for manufacturers to target the international market.

The major segments of the electronics hardware industry are information technology (comprising computers and computer peripherals), telecommunications (comprising switching equipment, transmission equipment and customer premises equipment) and consumer electronics (the major products being television, audio/video equipment, clocks and watches), control instrumentation, industrial electronics, strategic electronics and the electronic components industry which supplies components to these segments. They have similar basic building blocks, value chain and issues. Convergence is increasingly blurring distinctions between these segments. Technology evolution is resulting in increasing convergence. Hence, in view of future trends, it will be appropriate to integrate these segments into one industry – Electronics Hardware Industry (EHI).

The growth rate of the electronics hardware industry has been slower than that of the software and service industry during the Ninth FYP. This trend needs to be reversed into a growth path by introducing a set of policies conducive to the growth of the electronics hardware industry. An investment climate comparable to Taiwan, the Philippines, Singapore, Korea and Malaysia has to be created, to derive the maximum competitive advantage from the twin factors of low-cost high-quality knowledge-workforce and a fast growing domestic market. The electronics hardware industry is characterized by growing competition and shrinking margins and has to bear high risk arising out of technological

obsolescence. Hence, strong policy support from the government, coupled with fierce entrepreneurial spirit, is required. The sector-wise production of the electronics hardware industry during the Ninth Plan in India is given in Table 25:

Table 25
Production in Electronic Hardware Manufacturing Sector during Ninth Plan in India (Rs. in crore)

Sector	1997-98	1998-99	1999-2000	2000-01	2001-02 (E)
Consumer	7600	9200	11200	11550	13000
Industrial	3150	3300	3750	4000	4500
Computers	2800	2300	2500	3400	4000
Comm. & Broad Eqpt.	3250	4400	4000	4500	5000
Strategic	900	1300	1450	1750	1900
Components	4400	4750	5200	5500	6000
Total	22100	25250	28100	30700	34400

Source: Ministry of Information Technology (MIT) Report, Tenth Five Year Plan

On the assumption that an electronic hardware growth-oriented policy, similar to the software policy, would be introduced, the Ministry of Information Technology, Government of India, has projected the production of the electronics hardware industry sector-wise, as shown in Table 26.

Table 26
Sector-wise Projected Production by 2007

Sector	Production by 2006-07 (Rs. in crore)	Compound annual growth rate
Consumer electronics	38100	24
Industrial electronics	6600	8
Computers H/W	14900	30
Communication & Broadcasting	12500	20
Strategic electronics	3800	15
Components	15000	20
Total	90900	22

Source: MIT Report, Tenth Five Year Plan

Status and potential of electronics hardware industry in Punjab

During 1985-90, SAS Nagar, (Mohali), Punjab, was the hub of electronics hardware industry and the second largest centre after Bangalore with top-grade units in communications, computers and peripherals, electronic components including picture tubes, semi-conductor devices, active components, etc. However, during recent years there has been an overall decline of the electronics hardware industry and it seems to have lost its momentum. Table 27 shows the growth rate of the electrical and electronics industry in the state.

Table 27
Status of Electrical and Electronics industry in Punjab

Year	Units (No.)			Employment (No.)			Investment (Rs. lakh)			Production (Rs. lakh)		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1980-1981	977	10	987	5437	4495	9932	655	1635	2290	2073	5804	7877
1985-1986	2167	23	2190	10841	5742	16583	1827	11446	13273	4510	6694	11204
1992-1993	3633	27	3660	17495	8852	26347	4521	35522	40043	12809	53859	66668
1996-1997	4113	28	4141	20696	9448	30144	6609	65453	72062	26427	187719	214146
1997-1998	4223	33	4256	21947	10221	32168	8322	83765	92087	31388	252362	283750
1998-1999	4301	34	4335	22436	10487	32923	8731	92193	100924	33056	170823	203879
1999-2000	4403	35	4438	23203	9454	32657	9379	113859	123238	36193	111749	147942

Source: Director of Industries, Punjab

During 1999-2000, however, the total output of the electronics hardware industry has been Rs. 679.83 crore according to the *Statistical Abstract, Punjab 2001*. The major units are M/S Punjab Communication Ltd., Mohali (PCL); M/S Semiconductor Complex Ltd., Mohali; M/S Bharat Telecommunication Ltd. Ludhiana (Beetel), and M/S Telephone Cables Ltd. There are a large number of industries in the SSI sector, manufacturing PCs, power supplies, industrial electronic equipment, TVs, Radios, UPS, electronic instruments, electronic test zigs, tools and components, etc. Penetration of telephones, computers and colour TVs is quite high in Punjab. This, coupled with increased use of IT in the rural sector, E-governance, Internet, and software industry, the domestic market is expected to expand. The electronics hardware industry has a very good employment potential, as mostly ancillary units, particularly in the SSI sector, are run by self-employed graduate engineers, diploma holders, ITI's in engineering and graduates/post-graduates from the science stream. To achieve accelerated growth of the electronics hardware industry in the state the following measures are suggested:

- State government to give priority-sector status to the electronics hardware industry on par with software and service industries.
- An Electronic Hardware Technology Park (EHTP) in Mohali with world-class infrastructure will greatly boost the small-scale sector and attract new entrepreneurs and foreign investors. More Electronic Hardware Parks in the state on private initiative and with government support are necessary.
- Provide appropriate facilities and incentives to MNCs, to set up manufacturing plants in each sector of the electronics hardware industry in the state.
- Train and develop quality manpower suitable for evolving innovative designs and the development of manufacturing, assembly and quality control techniques.
- Set up Research and Development, Designs and Quality Control Centres in participation with industry, with financial and technical assistance from international agencies.

RURAL INDUSTRIES INCLUDING KHADI AND VILLAGE INDUSTRIES

The Punjab Government has been making special efforts to promote small-scale/tiny and cottage industrial, services and business units at the Rural Focal Points, to create employment opportunities in rural area. So far 594 Rural Focal Points have been identified, of which land has been made available for 263. These Focal Points are under the control of the Department of Rural Development and Panchayats. The status and growth of rural industries is given in Table 28.

Table 28
Growth of Industries in Rural Areas

	1980-81			1990-91			2000-01		
			Percentage		Percentage	Percent increase (compare with 1980-81)		Percentage	Percent increase (compare with 1980-81)
Units (in nos.)	Urban	32884	75.88	93267	58.16	183.62	117866	58.76	258.43
	Rural	10454	24.12	67101	41.84	541.87	82737	41.24	691.44
Employment (in nos.)	Urban	223018	84.20	482454	72.13	116.33	624806	69.61	180.16
	Rural	41851	15.80	186391	27.87	345.37	272836	30.39	551.92
Investment (in Rs. crores)	Urban	288.73	86.93	1000.91	74.21	246.66	2448.00	59.57	747.85
	Rural	43.4	13.07	347.87	25.79	701.54	1661.14	40.43	3727.51

Source: Director of Industries, Punjab

Table 28 indicates that there has been impressive growth in the last 20 years from 1980-81 to 2000-01 in the number of industrial units, employment and investment in the SSI/Tiny Sector. During 1980-81 to 2000-01 the number of industrial units in SSI/Tiny sector in rural areas increased eight times, employment 6.5 times and investment 38 times. Investment per employee in SSI/Tiny sector in rural areas increased during 1980-81 to 2000-01 from Rs. 10,400 to Rs. 60,000, compared to the increase of total SSI/Tiny sector per employee from Rs. 12,500 to Rs. 46,000 during the same period.

Traditional Rural and Tiny units in Khadi and Village Industries

Since its inception in 1956, the Punjab Khadi and Village Industry Board (KVIC) has been implementing various schemes for generating sustainable employment for the traditional rural artisans and entrepreneurs, by providing financial assistance and technical help for setting up village and tiny industries. The KVIC has been promoting very small and tiny industries by traditional artisans, such as weavers, spinners, cobblers, blacksmiths, carpenters, potters, etc. With the advance of technology, entrepreneurs have started making use of modern machinery and equipment and are manufacturing quality products. By 1999-2000 the number of units established under the schemes of the KVIC went up to 34,678, with production valued at Rs. 220.46 crore and employment of about 45,100 persons.

Improved infrastructure, upgradation of technologies and skills, easy credit, and better marketing are essential to improve productivity in the rural sector. Training on non-farm

income-generating activities is one of the necessary prerequisites for the creation of productive employment opportunities in rural areas.

THE INDUSTRIAL SUPPORT SYSTEM

Over the years several specialized institutions, some directly under government departments and others under corporate structure, have been set up in the state to provide financial, technological and other promotional support to industry. A brief overview of this industrial support system follows.

Small Industries Service Institute, Ludhiana

The Small Industries Service Institute of the Government of India was set up at Ludhiana in 1956 to serve small industries in Punjab. The main services provided by this institute are:

- Technical counselling
- Managerial counselling
- Economic counselling
- Management development training
- Product/Process oriented entrepreneurship development training
- Skill development training
- Modernization
- Ancillary development
- Export marketing
- Marketing assistance including sub-contract exchange
- Technology upgradation
- Energy conservation
- Pollution control
- Quality management
- Testing facilities by chemical laboratory
- Vendor development
- Workshop facilities (engineering)

Common facility workshops have been upgraded with the installation of CNC Horizontal and Vertical machines and CNC lathes in the Hi-Tech cell

Central Tool Room, Ludhiana

The Government of India established the Central Tool Room at Ludhiana in 1980-81 with financial and technical collaboration from the Federal Republic of Germany and the active support of the Government of Punjab. The Centre has been providing services to industry in general and small-scale units in particular, in such areas as technical consultancy, designing and manufacturing of tooling, heat treatment and training.

Central Institute of Hand Tools, Jalandhar

The Government of India set up the Central Institute of Hand Tools, Jalandhar, with UNDP assistance and the active participation of Punjab Government. Registered as a Society in 1983, it provides comprehensive support in the field of design and development of the latest hand tools, and consultancy and common facility services to small-scale entrepreneurs.

Mechanical Engineering Research and Development Organisation

The Central Mechanical Engineering Research Institute (CMERI), Durgapur, under the aegis of the Council of Scientific & Industrial Research (CSIR), established a centre in Ludhiana in 1965, known as MERADO, to boost mechanical engineering research and development in Punjab. The centre helps the industry in the following fields:

Design, development and standardization of industrial machinery and equipment, farm machinery and equipment and jigs, fixtures, tools and gauges. Testing of materials, components and products for hardness, tensile, compression, bending and impact strength, internal flaws by ultra sonic, radiographic, magnetic and penetrate methods, measurement of coat thickness and crack depth, precision measurements of linear and angular dimensions, profiles and surface finish, calibration of instruments and gauges, performance testing of I.C. engines, pumps, sprayers, etc., chemical analysis of materials, microstructure analysis and foundry sand testing. Preparation of feasibility reports for light and medium industries, industrial consultancy, expert guidance to the *foundry industry and precision jig boring, etc.*

Bureau of Indian Standards (BIS)

The Bureau of Indian Standards has an office at Chandigarh to provide quality testing of industrial products of the state.

Electronic Test & Development Centre, Mohali

This centre has been set up to provide testing facilities to electronic industries, besides developing new techniques for the growth of electronics industries in the state.

National Institute of Secondary Steel Technology, Mandi Gobindgarh

This institute provides technical services to the secondary steel sector by arranging seminars and workshops in the state and undertaking consultative projects and pollution studies relevant to the industry.

National Metallurgical Laboratory, CSIR, Batala

This laboratory provides facilities for research and development work, besides chemical, mechanical and metallurgical tests for ferrous and non-ferrous metals.

Central Food Technology Research Institute, Ludhiana

The CFTRI Mysore has set up an Extension Centre at Ludhiana for the development of the food processing industry in the state.

National Productivity Council, Chandigarh

The Council is engaged in the improvement of productivity of SSI units in Punjab.

Central Scientific Instruments Organisation, Chandigarh

This organization is equipped to carry out research, design and development in electrical, electronic, electro-mechanical, optical and medical instruments of different natures and specifications.

Central Leather Research Institute, Jalandhar

This organisation provides testing facilities, training in leather manufacturing and leather garments, research and development and extension services including common facilities.

Wood Grading & Marketing Centre, Ludhiana

This centre, set up in 1968 with the assistance of UNDP, mainly purchases quality wood to save producers and consumers from exploitation by middlemen.

Institute for Auto Parts Technology, A-9, Phase-V, Focal Point, Ludhiana

Institute for Machine Tools Technology, Batala

The Punjab Government with the assistance of UNDP/UNIDO has established these institutes, to cater to the overall development and growth of the auto-parts and machine tools industries. These institutes provide the following facilities:

- Design development
- Testing and job work
- Specialized short-term training
- Consultation

Bicycle & Sewing Machine Research & Development Centre

This centre was set up with UNDP assistance for carrying out research, design and development work on bicycles and components and sewing machines and components. It provides metrology, chemical testing and tool room facilities to the industry.

Northern India Technical Consultancy Organisation, Chandigarh

This organization provides a package of total consultancy services to the industry, covering all stages of project implementation. Besides, it also provides consultancy services to departments of the state government and financial institutions.

Punjab State Electronic Development Corporation

This corporation is engaged in the promotion of the electronics industry in the public, joint and private sectors. Besides, its also creates infrastructure facilities necessary for the growth of electronics industries.

Science & Technology Entrepreneurs Park (STEP)

Science & Technology Entrepreneurs Park provides space and environment for creative thinking/innovation, self-development, product development and venture development for science and technology entrepreneurs.

Punjab Energy Development Agency, Chandigarh

This agency assists in the installation of wind/water pumps and small aero-generators for battery charging and stand-alone power generator, on subsidy.

Punjab Pollution Control Board, Patiala

This institution has been entrusted with the task of implementation of the Pollution Control Act in the state. Some of the obligations of industrial entrepreneurs for control of pollution are clearance of site from the environmental angle and consent to establish an industry (N.O.C).

Industrial Development-cum-Quality Marking Centres

The Punjab Government has set up the following 10 Industrial Development-cum-Quality Marking Centres, which provide such services as quality marking, testing, research, design and development and common workshop services:

- Government Industrial Development-cum-Quality Marking Centre, (Engg), Amritsar.
- Government Industrial Development-cum-Quality Marking Centre, (Paints/Varnishes), Amritsar.
- Government Quality Marking Centre (Textiles), P.O. Rayon & Silk Mills, Amritsar.
- Government Industrial Development-cum-Quality Marking Centre (Engg.), Batala.
- Government Industrial Development-cum-Quality Marking Centre, Bathinda.
- Government Quality Marking Centre (Sports & Leather Goods), Industrial Area, Jalandhar.
- Government Industrial Development-cum-Service Centre (Engg. Goods), Ludhiana.
- Government Industrial Development-cum-Quality Marking Centre for Plastic Moulds, Ludhiana.
- Government Industrial Development Centre (Engg), Mandi Gobindgarh.
- Government Industrial Development-cum-Quality Marking Centre (Engg), Patiala.

Government Tanning Institute, Jalandhar

This institute provides diploma in tanning and footwear technology and training for artisans.

Banks

Punjab is well served by banks with 51 branches per 000' sq. km against the national average of 21 bank branches per 000' sq. km. By the end of December 2000, the following banking facilities were available in the state:

Indian commercial banks	2574
Co-operative banks	829
Post-office saving banks	3931
Foreign banks	1
	<hr/>
	7335
	<hr/>

Small Industries Development Bank of India

The SIDBI is an apex financial institution, established for the promotion, financing and development of small-scale industries. Through its branch office in Chandigarh, SIDBI administers the following schemes for the promotion of small-scale industry:

- Scheme for direct assistance to specialized marketing agencies.
- Scheme for assistance to marketing organizations.
- Scheme for purchase of mobile sales vans.
- Scheme for direct discounting of bills.
- Bill re-discounting schemes.
- Short-term bills re-discounting schemes.

National Small Industries Corporation (NSIC)

The NSIC supplies machinery and equipment on hire-purchase and lease-basis to small entrepreneurs, besides providing finance for purchase of raw materials under the Government Purchase Programme. The Single Point Registration Scheme of NSIC provides such marketing assistance, as supply of tenders free of cost; exemption from payment of earnest money; waiver of security deposit and issue of competency certificate. The corporation has opened a Prototype Development and Training Centre at Rajpura. Besides development of prototypes it also provides training facilities in the trade of electronics, plastics and computers.

Punjab Financial Corporation

Punjab Financial Corporation, set up in the year 1953 under the State Financial Corporation's Act 1951 to boost industrial growth in the state, provides medium and long-term loans to entrepreneurs for setting up new industrial units under various schemes and for expansion/diversification, renovation, modernization and rehabilitation of existing units. Assistance provided by Punjab Financial Corporation includes the following:

- Special scheme for unemployed persons.
- Composite Loan Scheme (AVIC).
- Single Window Scheme.
- Scheme for Scheduled Castes/Scheduled Tribes.
- Scheme for physically handicapped entrepreneurs.
- Scheme for ex-servicemen (Semfex).
- Scheme for women entrepreneurs (Mahila Udhyam Nidhi Scheme).

- Scheme for quality control facilities.
- Equipment Finance Scheme.
- Special Capital Scheme.
- Modernization Scheme.
- Scheme for purchase of generating sets.
- Scheme for hotel industry.
- Scheme for rehabilitation of sick units.
- General Scheme.
- Scheme for transport industry.

Punjab State Industrial Development Corporation, Chandigarh

Set up in 1966, the PSIDC promotes and develops medium and large-scale industries in the state and acts as an institutional entrepreneur. It provides financial assistance to projects promoted by private entrepreneurs in the state through term loans and direct participation in and underwriting of equity and preference share capital.

Technical education in Punjab

Punjab has a large network of institutions for imparting technical education. Such technical disciplines as computer engineering, electronics, architecture, irrigation, environmental engineering, agriculture structural engineering, textiles, chemical, mechanical, civil electrical, instrumentation and control, etc., are taught in these institutions. There are 19 institutions offering degree level engineering courses and 41 others providing diploma level technical courses. Besides these institutions, 130 Industrial Training Institutes and one Advanced Training Institute are also functioning in the state to impart technical training in different trades.

Institutional support to exporting units

The following institutions are connected with the promotion and development of exports from state:

- Export Marketing Wing, Directorate of Industries, Chandigarh.
- Joint Director-General of Foreign Trade, Ludhiana.
- Assistant Director-General of Foreign Trade, Amritsar.
- Export Credit & Guarantee Corporation, (ECGC), Ludhiana.
- Export Inspection Agency, Ludhiana.
- Export Inspection Agency, Jalandhar.
- Wool & Woollen Export Promotion Council, Ludhiana.
- Sports Goods Export Promotion Council, Jalandhar.
- Engineering Export Promotion Council, Jalandhar.
- Textile Committee, Amritsar.
- Textile Committee, Ludhiana.
- Punjab Small Industries & Export Corporation, Chandigarh.
- Apparel Export Promotion Council, Ludhiana.
- Regional Committee for Core Group on Exports in SSI Sector under the chairmanship of the Joint Director-General of Foreign Trade.
- Small Industries Service Institute, Ludhiana.

No consolidated report is available reviewing the functioning of the promotional and supportive institutions, set up at different points of time in response to the demands and felt needs of industry in specific situations. But, many of them have become largely inadequate and nearly irrelevant in the current globalized context in which the industry finds itself. Some of them are avoidable burdens on the state exchequer as their days are over!

OVERVIEW OF INDUSTRIAL POLICIES AND STRATEGIES FOR STRUCTURAL CHANGES IN THE EMERGING SITUATION

Like most other States, Punjab too has been making efforts to promote the development of industry, as evident from the successive Five Year Plans (FYPs), statements of industrial policy and growth strategies evolved and implemented by the government from time to time. As these policy pronouncements, coupled with the package of incentives and other promotional schemes, reflecting the priorities of the state, were expected to accelerate the growth of different sectors of industry, an overview of them is given in the following paragraphs.

Realizing that the small and tiny industry, which has been the backbone of industry in the state, flourishes best when there is commensurate development of modern large-scale industry, from the Sixth Five Year Plan (1980-85) onwards emphasis was laid on the co-ordinated development of large and medium and small and tiny industries. Accordingly, the Sixth Five Year Plan visualized the attainment of the following objectives:

- Accelerated growth and realization of economic benefits of the already created infrastructure of industries.
- Diversified rapid industrialization of the state.
- Promotion of rural industries for which separate incentives are envisaged, to ameliorate the economic condition of the weaker section of the society.
- Special emphasis on small-scale industrial units, to create maximum employment.
- Special incentives for setting up industries.
- Export of the state's industrial products and exploring new markets for exports.

The Sixth Plan provided an outlay of Rs. 81 crore for various promotional schemes and incentives for achieving these objectives, and actually utilized Rs. 74 crore. During this period industry grew at an annual rate of 5.41 per cent against 10.02 per cent in the Fifth FYP. Despite the progressive industrialization policy there was a slow-down in growth. The Seventh Plan (1985-90) continued the policy thrust of the Sixth plan with greater vigour. Actual expenditure under plan schemes went up to Rs. 149 crore against the approved outlay of Rs.124 crore and industry grew at an annual rate 10.05 per cent. During this period public sector undertakings and other industrial promotional institutions were strengthened, and the policy of providing incentives in the form of various subsidies was also continued.

The Industrial Policies of 1987 and 1989, which were introduced during this period, offered a package of graded incentives favouring 'no-industry districts' and 'backward areas', on the lines of the policy of the Government of India. The Industrial Policy of 1987 divided the state into four clearly identifiable categories of 'A', 'B', 'C' grade growth-areas and 'no-incentive areas', to bring about balanced industrial development. Capital subsidy, priority for power connection, sales tax incentives, land subsidy, exemption from electricity duty, special incentives to export-oriented units and entrepreneurs belonging to the SC community and generating-set subsidy were given under this policy. The Industrial Policy of 1989 continued to provide the package of incentives which included:

- (1) Capital subsidy
- (2) Sales tax incentives
- (3) Purchase tax
- (4) Sales tax exemption/deferment for expansion/ modernization/diversification
- (5) Special incentives for pioneer units
- (6) Land subsidy
- (7) Priority for power connection
- (8) Exemption of electricity from electricity duty
- (9) Special incentives for specific categories of industries/entrepreneurs
- (10) Generating-set subsidy

At the same time certain types or industry were categorized as 'no-incentive industry'.

There was a gap of two years between the terminal year of the Seventh Plan and the beginning of the Eighth Plan. During this period (1992-97) the emphasis in the strategy of industrial policy and planning was shifted from accelerated growth to generation of gainful employment and balanced regional growth, as would be evident from the following policy objectives:

- Generation of gainful employment, particularly in rural areas, for optimum utilization of skilled/unskilled manpower and fuller utilization of raw materials, particularly agro-products available in rural areas.
- Balanced regional growth for removal of rural-urban disparity.
- Technological upgradation and modernization to achieve higher productivity and improve quality standards and designs to increase exports.
- Development of rural/cottage industries to exploit local resources.
- Provision of counselling services for better and scientific marketing and management techniques.
- Emphasis on upgradation of rural industry through improved technological inputs.

At about the same time was announced the Industrial Policy of 1992 with the following special features:

- Multiplicity of incentives avoided and only two incentives, viz., Investment Incentive and Sales Tax Concessions continued.
- Stress on investment in border districts for creating employment for youth in the area.
- Special incentives for electronic units.

The draft of the Eighth FYP proposed an outlay of Rs. 576 crore, out of which the lion's share of Rs. 317 crore was for state-level promotional institutions, such as the PSIDC,

the PFC and the PSIEC, while a sum of Rs. 26.5 crore was set apart for R&D Centres, including the new Machine Tool Centre at Batala and the Automotive Centre, Ludhiana, and technology upgradation. However, the Plan that was approved reduced the total outlay to Rs. 162.9 crore, but the actual expenditure was, Rs. 195.88 crore. Out of the total expenditure, approximately 60 per cent (Rs. 117.5 crore) was on account of payment of incentives to industry.

The Ninth FYP (1997-2002) gave high priority to infrastructure and technology upgradation and the thrust areas were:

- Proper infrastructure facilities.
- Upgradation of technology and modernization of industry.
- Reducing direct investment of government in production activities.
- Provision of adequate facilities/concessions to attract new entrepreneurs.

Though the outlay of the Ninth FYP was Rs.349.79 crore (out of which interest subsidy alone accounted for Rs. 301 crore), actual utilization during the first four years was Rs. 71.67 crore, about 20 per cent. The outlay of Rs. 288.9 crore for the Tenth Plan is less than the provision of Rs. 349.79 crore for the Ninth Plan (as shown in Table 29) and the major part of it (Rs. 250 crores) is again for grant of incentives, which have already accrued. The Plan lays stress on modernization and technological upgradation and provides approximately Rs. 30 crore, mainly for setting up the UNIDO-assisted R&D projects for Machine Tools, Batala; Automotive Centre, Ludhiana; Central Institute of Hand Tools, Jalandhar; and the North India Institute of Fashion Technology. However, the actual budgetary provision for industry for the first year of the Plan, i.e., 2002-03, is just Rs. 25 lakh for the North India Institute of Fashion Technology!

Quite interestingly, the Industrial Policy and package of incentives announced by the state government in 1996, which are still in vogue, sought to achieve the following targets:

- Increase the annual industrial growth rate from the present eight per cent to 12 per cent in the next two years.
- Increase the present share of industry in Gross Domestic Product (GDP) from 17 per cent to 25 per cent in the next five years.
- Divert 15 per cent of the present rural population to manufacturing and related occupations, through rapid industrialization, and thereby reduce dependence on agriculture and allied activities in the next fifteen years

Table 29
Plan- wise Approved Outlay, Actual Expenditure and Annual Growth Rate of Industry

	Approved Outlay (in Rs. lakh)	Actual Expenditure (in Rs. lakh)	Average annual growth rate of industry
6 th Plan(1980-1985)	8183.00	7417.00	17.87
7 th Plan(1985-1990)	12331.00	14900.00	16.61
8 th Plan(1992-1997)	162.92	19588.00	21.81
9 th Plan(1997-2002)	34979	7167.00 (first 4 years)	13.39
10 th Plan(2002-2007)	28893.00		
For 2002-2003	100.12*		

Note: * Actual budgetary provision for the year of 2002-03 is just of Rs. 25 lakh.

It is evident from the Industrial Policy Statement, that the packages of incentives and the allocation and actual utilization of funds during successive FYPs do not form part of an integrated, long-term strategy for planned development. The Ninth Plan presents a very dismal picture of the industrial sector and indeed, of the whole process of planning and implementation of plan schemes.

Trends in employment generation

As evident from Table 30 employment per unit has declined from six in 1980-81 to four in 1999-2000 in the SSI sector and from 481 to 386 in the large and medium sector during the same period. Investment per employee and production per employee have shown an increasing trend during the same period for both the SSI and the large and medium sectors. This trend, perhaps inevitable in the current competitive context, has a serious impact on employment generation and related socio-economic aspects of development, which deserves attention at policy-making levels.

Table 30
Average Employment per Unit, Investment and Production per Employee (Rs.)

Year	Employment Per Unit		Investment Per Employee (Rs.)		Production Per Employee (Rs.)	
	SSI	L&M	SSI	L&M	SSI	L&M
1980-1981	6	481	12535	66269	42226	103954
1985-1986	5	453	15898	112709	46277	191757
1990-1991	4	504	20166	213121	60549	376593
1995-1996	4	400	27622	415501	116063	791462
1999-2000	4	386	42963	625688	188117	1005121

Source: Based on data from Director of Industries, Punjab

The average investment in plant and machinery per small-scale unit in Punjab was only Rs. 1.46 lakh in 1997-98, which was much lower than Rs. 5 lakh in Maharashtra. During the same period the average employment per unit in Punjab was significantly low at 4.3 compared to eight in Maharashtra. During the first three years of the Ninth FYP the average production per small-scale unit in Punjab has been only Rs. 7.45 lakh, which is less than half the all India average of Rs. 16.82 lakh. These and other indicators show that though there has been progress in the industrial sector, Punjab is still lagging behind other states like Maharashtra.

Table 31
Number of Job Seekers on Live Registers of Employment Exchanges as on 31 December

Year	Unskilled	Skilled	Total
1980	NA	NA	452596
1985	NA	NA	636408
1990	101811	557439	659250
1992	239612	508174	747786
1995	138760	367476	506236
1997	138683	442335	581018
1998	118294	449918	568212
1999	123456	421561	545017
2000	110294	425865	536159

Source: Statistical Abstracts of Punjab

Table 31 reveals certain other aspects of the employment situation. From the live registers of employment exchanges it is observed that during the Sixth FYP (1980-85) the number of job seekers increased by 40 per cent, whereas during the Seventh FYP it remained static. During 1992 it peaked at 7,47,786, apparently due to a sudden increase in the registration of unskilled workers. By 1995 the situation improved and the number of job seekers decreased to five lakh. By the end of the Eighth FYP skilled workers swelled the number of job seekers to 5,81,018. During the first three years of the Ninth FYP this number has decreased slowly.

General observations and some suggestions for structural changes

Small scale industries in the state, the backbone of its industrial economy, are currently producing by and large low-value items, including sports and leather goods, hosiery and woollen textiles, hand tools, machine tools, bicycles and parts and sewing machines and parts. The level of technology in use in these industries is quite low, which results in low industrial productivity and quality of products, leading to a competitive disadvantage both in domestic and global markets. Upgradation of technology is the crying need of the hour for the very survival of most of the SSI units in the state. The Research and development facilities available are on the one hand woefully inadequate and out-dated and on the other seldom put to optimum use.

With the process of the integration of the Indian economy with the global economy and the consequent far-reaching structural changes taking place, small-scale industries have to adapt and adjust themselves to the demands of the time, requiring them to become internationally competitive. They have to transit from a protected to a competitive environment. At the same time the WTO regime opens up a window of opportunities for small-scale industries to grow and flourish with access to wider global markets. Upgradation of manufacturing processes and management practices, through the induction of technology, modern machines and adoption of international quality standards, are essential prerequisites for taking advantage of the emerging opportunities. This transformation has many implications, both in terms of governmental policies to promote small-scale and village industries and of providing a new focus and orientation to the institutions that have been set up in different contexts for this purpose. The thrust of government policies and programmes in the near future has to be specially geared primarily to bring about this transformation at the least cost to the economy. This is all the more important in the context of the existing weaknesses in the small-scale sector. According to estimates of the RBI, about 30 per cent SSI units were sick as at the end of March 1999 and if incipient sickness was also included, the number of sick units and closed units taken together would account for about 40 per cent of the total number of small-scale units.

Against this background, comprehensive reforms and structural changes are required to create WTO-compliant delivery mechanisms of developmental initiatives with the direct participation of industry.

- In the special context of the current financial crisis facing the state government, its role in the emerging industrial scene, will necessarily have to be limited to that of an active facilitator and co-ordinator of the processes of growth, providing a transparent conducive policy frame-work and efficient delivery mechanisms through good governance. Viewed in this light the following recommendations/observations of a systematic nature suggest

themselves for consideration over and above those made recently by the Chief Minister's Advisory Committee on Industrial Growth:

- Keeping in view the experience gathered over the years in setting up and managing research and development centres, including the Departmental Industrial Development-cum-Quality Marketing Centres, the emerging requirements of industry and the severe constraints on the Central and State Governments, the management of these institutions should be entrusted to relevant Associations of Industry, on the basis of binding partnership protocols evolved through a consultative process. The Department of Industries of the state government could take urgent initiative in this regard, so that arrangements for providing one of the most vital inputs required for the survival and growth of industry, especially in the SSI sector, are not delayed. Needless to stress, considerable idle infrastructure and large human resources available with government could be put to optimum use through this process. This could start with the Bicycle and Sewing Machine Research and Development Centre on the lines discussed earlier.
- The functioning of the Directorate of Industries should be reviewed and reoriented in order to make it more relevant to meet the requirements of industry in the emerging scene. Some of its officers, who are professionally qualified and competent, could be seconded to Associations of Industry where they could make better contribution by involving themselves actively in the developmental processes of various segments of industry. The Department of Industries could take necessary initiatives in this regard, as several issues of policy, including deployment of government officers outside departments and agencies of government and their service conditions are involved.
- The role of Udyog Sahayak should be redefined and strengthened and put on a statutory basis in order to facilitate effective operation of the 'One Window' concept for industrial promotion. The Kerala legislation, with appropriate modifications to suit state-specific requirements, could be the model for this purpose.
- Taking into account the sweeping changes taking place in the economy and their immediate as well as long term impact on industry, especially the SSI sector, an appropriate institutional mechanism, such as a state Industrial Promotion Board with wide statutory powers and functions should be put in place after due consultations with the relevant stake-holders to deal with sickness and symptoms of sickness in segments of industry/industrial enterprises.
- The proposed industry-driven State Industrial Promotion Board could be statutorily empowered to constitute an Industry Development Fund, with the levy of a development cess of say one per cent on the annual turnover of industrial enterprises with a turnover of over rupees one crore a year. The State Industrial Promotion Board could be statutorily obliged to utilize the Fund for the promotion of industry in accordance with the priorities it lays down from time to time.

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Chapter 7

INFRASTRUCTURE DEVELOPMENT

Infrastructure is the mother base for all activities. It is from the band of services within this domain that all other developmental activities draw their sustenance. Inadequately envisioned, or poorly delivered, it can stunt growth for decades.

As the world over this sector has been traditionally managed by the government, there is a presumption nowadays that the reason for this is to be found in its ownership *per se*. A number of studies the world over have found that the ownership pattern, whether public or private, is not conclusively linked to the actual performance of an enterprise. Examples of success and failure are equally distributed, irrespective of public or private ownership.

It is also not correct to be taken over by a 'the state has no funds' mentality. The reason for the unsatisfactory delivery of the infrastructure sector is also not within the 'resource crunch' hypothesis, but embedded in the inefficient working of the sector. This sub-optimality flows from an inherent presumption that the services within the sector can be run non-commercially, and/or can only survive based upon inputs of subsidies from other sectors.

Irrespective of ownership, the government would do well to devise sustainable long-term financial and business models, which are in a position to deliver infrastructure services, in line with the overall developmental vision of the state. From envisioning to implementation, the process should be communicative, and have peoples' participation all through. It remains clear that people do not expect services for free. While they may expect these freebies in the short run, they remain aware that this free service model will ultimately lead to the collapse of the service itself. People want working and guaranteed services, and they are willing to pay a reasonable price.

AGENDA FOR INFRASTRUCTURE

There cannot be any planning for infrastructure without a developmental vision. Infrastructure is the ultimate supplier, and everybody is its customer. Being the supplier of last resort, it must, therefore, subordinate itself to requirements of all other sectors.

Based on a blueprint of Punjab for 2020, the infrastructure sector can set itself an agenda in line with what is outlined in the following section.

Primary Sector

Dependence on bulk foodgrains is starting to taper off. The farm sector will switch over progressively to commercial cropping. The area under oilseeds, sugarcane, fruits and vegetables will gradually increase. While there will still be a demand for transport of bulk foodgrains, we will witness increased activity in the processing of agro-products, bringing

in the demand for speedy transport. There will be need for refrigerated movement to Indian and foreign destinations. The farmer will need support from information technology by setting up 'virtual mandis' for regional, national, and international trading. For this, the telecom and IT backbone will have to be strengthened and taken to the villages.

The farm and rural sector will require assured supply of good quality electricity for production of cash crops, agro-processing, storage, and to ensure the working of computers and telecom devices. The farm sector will need assured supply of fertilizers. As evident from current trends, consumption of urea will go down, and phosphatic fertilizer will increase.

Secondary Sector

Other than farming, Punjab has little primary resources. There are no coal, mineral or fossil fuel deposits that can be tapped. At present we are seeing a declining trend in the overall daily number of workers employed in the registered factories in the state.

There is no large industry in Punjab at the moment, which employs more than 5,000 people. All future hopes appear to be based on setting up an oil refinery by Hindustan Petroleum Corporation Ltd. near Bathinda. The reasons for these expectations are not very clear. Refinery building being a very specialized job, machinery, plant equipment, and other requirements are not likely to be sourced from within Punjab. The setting up of the refinery is not going to cause any significant changes in the sale and distribution patterns of petroleum products. At best, there would be some potential in transport, and direct employment for about 500 persons.

The major industries are textiles and readymade garments, motor parts, cycle and cycle parts and manufacturing of various food products. Their growth rates are not very encouraging.

Considering the more than five lakh youth borne on the live register of Employment Exchanges in Punjab, and the hidden unemployment in the farm sector, the industry sector in the state does not offer significant hope. With the most optimistic scenario, and in keeping with trends data of the *Economic Survey of Punjab*, industry may generate 10,000 fresh jobs per year, which is too little.

As is clear from the *Economic Survey of Punjab 2001-2002*, the real growth potential in future is anticipated to be in agro-processing. Considering that the strength of the state is in the primary sector, this appears to be reasonable, and the government is likely to put in place a strategy for this. Therefore, the infrastructure sector should also target this, and remain available to answer challenges. These are in the provision of speedy transport, assured power, broad-band telecom connectivity, and in the availability of latest farm and food-processing technologies.

Tertiary Sector

The tertiary sector provides trade, transport, banking, insurance, IT services, etc., and has grown at a rate of over seven per cent per annum. Considering the potential of growth in this area, infrastructure should also concentrate on it for speeding up the development of Punjab. This will need laying down broad-band telecom networks,

assured power supply, reliable transport infrastructure, including a well managed international airport.

The tertiary sector depends upon knowledge enhancement. The state has medical, engineering, and architecture colleges, along with management institutions. Punjab Technical University is also going ahead with its programme of taking technical education to the people, including IT skills. It may be noted that the tertiary sector is most dependent on good infrastructure support. Unlike the primary and secondary sectors, it is knowledge-person-oriented, and can be re-situated quickly. It is amenable to IT, and if the persons involved in it find any infrastructural lacunae, they take flight quickly. Thus, with the right infrastructure and policy to match, tertiary sector development can achieve a much steeper growth curve.

Health services are one of the most important tertiary sector activities. Trends are showing an increase in respiratory and circulatory system diseases, including cardiac ailments. Another area responsible for large casualties is accidents, especially road accidents. Heart, lung, and trauma management are areas, which need quick movement to the health centres. Therefore, infrastructure will have to factor in these important issues. It should assist in the prevention, diagnosis, and emergency management of these health issues all over the state.

With this vision, and a resultant agenda for infrastructure, the state can proceed to put in place the various sectors involved.

In this chapter, we comment on the following infrastructure sectors:

- Energy
- IT and Telecom
- Transport

ENERGY

Resources and Current Availability

One of the most vital inputs, it literally fuels the engine of progress and development. It can be tapped from both renewable and non-renewable resources. Let us examine the availability of the primary sources of energy (Table 1).

Table 1
Primary Sources of Energy

Renewable	
Hydro-power	Yes
Biogas	Yes, limited
Solar	Yes
Wind	Negligible potential
Geo-thermal	No
Tidal	No
Non-renewable	
Coal	No
Oil	No
Gas	No

Nuclear energy as an energy source is not considered on account of it being ruled out for strategic reasons, as Punjab is a border state. Considering the resource base, Punjab should concentrate on mini-and micro-hydel schemes, solar and biogas areas in renewable energy.

In the case of non-renewable sources, coal is already a major source of energy. Punjab is heavily dependent upon Guru Gobind Singh TPP at Ropar and Guru Nanak Dev TPP at Bathinda, and is also in an expansion mode for further units at Guru Har Gobind Singh TPP at Lehra Mohabbat. Thermal power continues to be the major supplier of energy in the state. Since 1997, thermal power has become the mainstay of electrical energy availability in the state (Table 2).

Table 2
Electrical Energy Availability (in million kwh)

Year	Thermal Generation	Hydro Generation	Purchased	Total
1991	5426	7540	2515	15481
1996	7534	7557	4972	20063
1997	8978	7616	5084	21678
1998	9424	6806	6647	22877
1999	9989	8808	6296	25093
2000	12641	7739	6008	26388
2001	13217	7063	6892	27172
2002	13198	6967	6830	26995

Source: Punjab State Electricity Board

Punjab also purchases power from outside, notably from Baira Siul, Singrauli thermal, Salal hydel and others. In 2001-2002, such purchases are likely to be about 6,830 million kwh. Thus, the state's self-generated thermal power accounts for 50 per cent of total power availability, 25 per cent coming in from self-generated hydel sources, and the remaining 25 per cent being purchased from outside. The complete picture of electrical power availability in India is clear from the following Table 3:

Table 3
Electrical Power Availability in India

	1997-98 (billion kwh)	1998-99 (billion kwh)	1997-98 (Annual growth in per cent)	1998-99 (Annual growth in per cent)
Power generation	420.6	448.4	6.5	7.5
Hydro-electric	74.5	82.7	8.8	1.9
Thermal	336.1	353.7	4.6	9.9
Nuclear	10.0	12.0	14.1	12.8
Plant load factor of thermal plants (Percent)	64.7	64.6	-	-

Source: www.ficci.com/ficci/econo-upda/power.htm

While electrical generation is growing at an overall rate of 7.5 per cent, the major growth is in the thermal and nuclear sectors. With nuclear power ruled out, and mega hydro-

project power availability in the near future uncertain, Punjab has moved on the right track of building up a thermal generation capacity.

GVK Goindwal Sahib Power Project (500 MW)

This 500 MW coal-fired power plant is coming up in the Amritsar district of Punjab, with a 2X250 MW configuration. Coal for the project has been linked and the EPC contractor has been selected. The project also envisages using imported coal. The first unit will be commissioned in 34 months from the date of financial closure and the second unit in four months from then. This will be the state's first independent power project. It is likely to pump in 2,715 million kwh per year at 68.5 per cent plant load factor. The fuel supply agreement has been negotiated with Eastern Coalfields Ltd., and the fuel transport agreement with Northern Railways is under negotiations. For the escrow account agreement with PSEB, the matter is under consideration by the Board. On account of financial difficulties and slow progress of reform, PSEB is not able to go ahead with the escrow account, and the project is stagnating.

Transmission and Distribution Losses

Examining the facet of transmission losses, we find that Punjab is in an almost enviable position. In 1980-81, it was 19.6 per cent, and peaked to 21.5 per cent in 1991-92. It has been shown in 1999-2000, as 15.07 per cent, as against Maharashtra 32.17 per cent, Karnataka 38 per cent, and even next door Haryana and Delhi at 37.29 per cent and 47.52 per cent respectively. The state's achievement in T&D losses minimization is laudable, but it is worthwhile to mention that with one-third of the power being distributed free, where is the need for theft? It is thus possible that real T&D loss may be higher than reported, with a part of it shown in the agriculture area. By factoring in experience of Punjab's pre-free electricity days, it is safe to consider the real T&D loss at about 20 per cent. Considering the domain of possibility, there is potential to bring this down to about 10 per cent, and this can add about 1,500 million kwh per year.

Generating Efficiency

The average plant load factor (PLF) for Punjab's thermal units is about 69% (Table 4). A comparison with the other states is as under:

Table 4
Plant Load Factor of Thermal Plants

State	1994-95	1995-96	1996-97	1997-98	1998-99
SEBs	55	58	60.3	60.9	60.1
AndhraPradesh	70.2	77.4	81.4	85.0	80.7
Gujarat	60.5	65.3	65.4	66.1	64.6
Karnataka	64.9	67.7	70.2	75.2	81.6
MadhyaPradesh	58.2	58.7	74.4	74.9	77.7
Rajasthan	75.6	73.7	75.6	82.1	78.1
Central Sector	69.2	71.0	71.1	70.4	71.1
Private Sector	65.8	72.3	71.2	71.2	68.3
Punjab	56.7	55.0	65.7	69.0	69.4

Source: Annual Report, Ministry of Power 1999-2000

Punjab may seek comfort in the fact that the national average load factor for thermal units is 65 per cent, but that can provide little solace, weighed down as it is by Bihar's

35.8 per cent, and Assam's 18 per cent. The fact is that a number of states are doing very well, and Punjab should attempt an 80 per cent plant load factor. Such technical arguments as old machinery, etc, are given, but available examples in industry speak for themselves. Pre-NTPC, the Badarpur plant in Delhi was declared unmanageable, and was running at about 31.4 per cent PLF. Post-NTPC, the plant continues to be important for Delhi, and is running at 80 per cent PLF. There exists a possibility of adding about 1,500 million kwh by enhancement of PLF to 80 per cent plus.

Total Expected Availability

Even if we factor in another 1,000 million units as being made available/saved through micro-hydel and renewable energy sources such as solar power and biogas, it becomes clear that self-sufficiency in energy cannot be achieved. Even today, Punjab is buying about 7,000 million kwh from the grid, and it shall continue to do so. In fact, this will increase, anticipating further growth in demand for power, as realized from an analysis of consumption trends. The total likely availability of power from the state's own resources by about 2010 is shown in (Table 5).

Table 5
Conceptual Framework of Availability of Power from the State's Own Resources by 2010

Generation	Units
Thermal at 68% PLF	16000
Hydel	7000
Non-conventional resources, micro-hydel	1000
Enhancement of PLF to 80% plus	1500
Minus T&D losses @ 10%	2550
Total	23000

Consumption

Punjab has the highest per capita consumption of electricity among all states in India, at 904.58 kwh per year (Table 6). It achieved 100% electrification in 1980.

Table 6
Annual per Capita Consumption of Electricity by States 1999-2000 (million kwh)

State	Domestic light and small power	Commercial light and small power	Industrial	Public lighting	Agricultural	Total
Andhra Pradesh	63.57	12.77	114.05	3.97	133.4	327.80
Bihar	10.52	4.19	85.04	0.45	15.39	115.59
Gujarat	83.83	29.11	261.46	3.29	311.40	689.09
Haryana	105.93	19.74	126.66	1.57	232.80	486.70
Karnataka	63.04	10.14	90.83	3.18	181.72	348.91
TamilNadu	70.96	40.90	217.75	4.07	120.46	291.72
Maharashtra	102.81	27.68	251.02	5.59	116.24	503.34
Punjab	161.31	34.11	355.19	2.58	351.39	904.58

Source: Central Electricity Authority

A sample of the states has been taken, and Punjab is the highest in per capita consumption in domestic, industrial, and agricultural use. There are only three Union Territories of Daman & Diu, Pondicherry, and Dadra & Nagar Haveli, with a higher industrial consumption, on account of large projects. Chandigarh and Delhi have higher domestic consumption. On the overall, the per capita consumption in Punjab would definitely place it as one of the high energy-consuming societies. The sub-sectoral break-up of power consumption in Punjab is shown in (Table 7).

Table 7
Sub-sectoral Break-up of Power Consumption in Punjab,
1970-71 to 2000-01 (Percentage)

	1970-71	1980-81	1990-91	1998-99	1999-00	2000-01
Domestic	9.77	11.74	13.60	18.43	18.06	22.02
Commercial	5.22	3.29	2.74	3.85	3.82	4.74
Industrial	35.96	38.09	36.26	36.58	36.78	41.95
Public lighting and bulk	11.05	3.27	4.53	2.04	2.01	2.44
Agriculture	38.00	43.66	42.87	39.10	39.33	28.85

Source: Economic and Statistical Organisation

Domestic supply: The share of domestic consumption has more than doubled since the seventies, and is likely to rise further (Table 8). While being the highest per capita consumer, it is necessary to take note of the households with electricity (Table 8).

Table 8
Households Using Electricity in Punjab

Year	Total Households	Households using Electricity	Percentage
1980-81	2748453	1553629	56.53
1990-91	3365132	2754312	81.85
1999-00	4174410	3565857	85.42
2000-01	4267250	3699739	86.70

Source: Punjab State Electricity Board
Economic and Statistical Organisation

Thus, growth of demand from domestic households can be anticipated as we move towards real 100 per cent use of electrification. This trend will be more pronounced because Punjab is quickly moving to being one of the most urbanized states in the country. In 1951, there was 22 per cent urbanization; this had jumped to 34 per cent in 2001, and is further expected to touch 45 per cent by 2020. This implies that out of the current population of 2.25 crore, 0.77 crore are urbanized. This figure will move to 1.92 crore with the expected population of 4.26 crore in 2020, as against 2.34 crore in rural areas. Thus, while net addition to rural population will be 0.87 crore, urban figures will go up by 1.15 crore. The clear ramifications of this are:

- Domestic sector will need and demand 100 per cent electrical supply.
- Since urban consumptions are higher than rural, we can expect an increase in per capita power consumption.

The domestic sector uses 4,400 million kwh of power, and we can expect an additional annual demand of about 400 million kwh every year, doubling the total requirement to about 8,500 million kwh by 2010, while the population will double after 2020.

Commercial supply: The commercial sector consumes about 1,000 million units. With increased urbanization, such commercial activities as trading, health services, retail outlets, etc., will increase at a fast pace. Until now, this sector has remained largely stable in its power consumption, even going down at certain times. It will now add to its consumption as an important growth area in the tertiary sector. There is also a trend towards energy-consuming displays, and an affinity for air-conditioning the commercial setup to attract customers. It is anticipated that in keeping with global trends, the commercial sector will demand extra energy. Since Punjab anticipates growth in the tertiary sector services market, it would be necessary to plan for an additional requirement of 250 million kwh per year till 2010. The commercial sector will thus need 3,500 million kwh per year.

Industrial supply: No major industry, other than the Hindustan Petroleum refinery, is slated for Punjab. At present, it is planned with a captive power plant to trap released gases and byproducts and become a power-surplus unit. For the last decade, the industrial sector has been demanding extra energy at the rate of about 400 million kwh additional units every year. The consumption in 2000-01 was 8,000 million kwh, and plans should be made keeping the same in mind. Thus, the industrial sector will need 12,000 million kwh per year in 2010.

Public lighting and bulk: Public lighting and bulk-sector demand remains at 500 million kwh. The major addition to this is the bulk demand from the Northern Railway, with electrification sanctioned upto Amritsar. It is anticipated that further electrification projects will be taken up to handle the suburban and inter-city passengers of Punjab's metropolitan and other large towns. After discussions on this with the Railways, it would be wise to add 1,000 million kwh in this segment by 2010.

Supply to agriculture: The agricultural sector today needs about 5,500 million kwh. This demand has been going down in recent years, with the peak at 8,200 million kwh. Undoubtedly, it is linked to the demand for water, and thus is a correlate of rainfall and availability of assured irrigation. Its decreasing demand is on account of a succession of good monsoons, and the area under irrigation increasing from 57,81,000 hectares in 1980 to 75,44,000 hectares in 2000. However, the rains can always fail, and though the demand in this sector is not likely to increase from its peak of 8,200 million units, at least this much should be planned for as being available for this sector. At present too, with the failure of the monsoon, a large demand has been generated in the agricultural sector, and urban domestic and industrial supplies have been badly disrupted.

Total Demand: In keeping with international demand trends, over the decade from 2010 to 2020, the overall demand is likely to double, and stand at 68,000 million kwh.

Table 9
Anticipated Demand for Energy (in million kwh)

Sector	Demand in 2010
Domestic	8500
Commercial	3500
Industrial	12000
Public lighting and bulk	1500
Agriculture	8500
Total	34000

Source: *Economic Survey of Punjab*
Punjab State Electricity Board

Even for a time horizon of 2010, the anticipated demand for electrical energy is anticipated at 34,000 million units against a likely self-generation of about 23,000 million units (Table 9). To cover this shortfall, Punjab will need to put in place an additional 3,000 MW of generating potential at PLF of about 80 per cent. This large chunk is nowhere in sight, and there is no possibility of generating the anticipated 68,000 million kwh by 2020. Environmental concerns also dictate that Punjab should seriously evaluate the effects of setting up more thermal-based generation capacity.

Punjab must accept the fact that in the conceivable future, it will always be shopping for power on the national grid. This would appear to be in the interest of both the state and the nation, with a number of power surplus states, central sector generating units in a position to sell, IPPs, and the emerging road map in the power reforms sector

Shift To Commercial Basis Through Basic Reform

It is in the interest of the state to shift to a commercial basis for generation, transmission, and distribution of electricity. An examination of costs and revenues will apprise of the implicit subsidies in PSEB operations. Earlier, it was largely supplying power, by purchasing it from outside. From 1975-76, it entered the self-generation phase, and from then on, the cycle of subsidy really started. In the first phase, PSEB was a supplier, and in the second phase it became a generator (Table 10). 'In the first phase, the cost was decreasing, but in the second phase, it showed an increase.....insistence on greater power generation was confined to the second phase.....proved a costly affair. Rising coal prices and haulage costs, T&D losses, lower PLF....contributing to these cost escalations' (*Scope for Raising Agricultural Power Tariff in Punjab*, Abnash C Julka, CRRID).

The mainstay of PSEB generation is thermal power stations. The cost of coal received is lower than the transport and handling charges! The coal supplied was of such a low grade that the ash content was in the range of 40 per cent. It means that PSEB effectively paid for coal, but got 40 per cent less, and bought and transported ash at the cost of coal! In addition, lower grade coal results in excess handling, higher pollution levels, undue wear and tear of various equipment resulting in shorter life-spans and earlier replacements. The auxiliary consumption of total fuel is increased. Above all, the disposal of ash is another major problem, and constitute almost an environmental disaster. In future, power utilities may even have to pay to transport the ash back, for being disposed in redundant coal mine shafts, to prevent large scale air and ground pollution.

Table 10
Cost and Revenue per Unit of Electricity (in Rs.)

Year	Cost per unit	Revenue per unit	Subsidy per unit
1967-68	0.47	0.17	0.30
1975-76	0.75	0.18	0.57
1980-81	0.88	0.24	0.64
1988-89	1.43	0.51	0.92
1990-91	1.54	0.63	0.91

Source: Rangnekar 1990

According to the *Economic Survey of Punjab 2001-2002*, the current average cost per unit of electricity is Rs 2.93, and average revenue per unit Rs 2.07, implying a present level of subsidy at 0.86 paise per unit. While the PESA supplied power free to farmers, it supplied it to the commercial sector at Rs 3.99 per unit, and to industry at Rs 4.13 per unit. This runs counter to the policy of attracting growth in secondary and tertiary sectors.

In such a situation, there is always the possibility of wrong diagnosis. The 'resource crunch' theory is all pervasive, and somehow it appears that the only issue is that the government does not have funds to set up additional capacity. The result of this is the disastrous Independent Power Producers (IPP) programme. While these fast track IPP projects were brought on, the basic reforms in the power sector were placed on the back burner. Private power generators realized this, and forced the government into Power Purchase Agreements (PPAs), shifting the entire risk onto the SEBs. As a result, we find many of these projects in doldrums, starting with the (in)famous case of Dabhol Power Corporation, and Punjab's own Goindwal project. If basic reforms are not brought about, and if there is only an attempt to shift risk rather than decrease it, there may be a situation when the IPPs may even work to oppose power sector reform, armed as they are with guarantees, and counter-guarantees ('Power Sector Reform and Regulation: The Road Ahead,' Sebastian Morris, *India Infrastructure Report 2001*).

Thus:

- It is in the overall economic and environmental interest of Punjab not to conceive of fresh generation capacity, other than micro-hydel, and initiatives in solar and bio-gas energy areas.
- Punjab should shift to a commercial basis of electrical energy generation, transmission and distribution.
- This will mean increased PLF at the generating end, with a target of 80 per cent.
- On the transmission side, the losses will have to be limited to 10 per cent.
- At the distribution end, power must be metered and charges recovered in accordance with a tariff policy.

It is worthwhile to remember that some government-controlled PSUs have a better PLF than private operators. This only highlights the fact that mere privatization is not the solution, but increase in efficiency is the answer. Cases of power sector reform are now noticeable in India. UP has divided its SEB into generation, distribution and transmission companies, with privatization of power distribution in Kanpur under way. Delhi has recently brought in Tatas' BSES to take over distribution in the national capital.

PSEB - Reform Status

According to the Ministry of Power, the status is as under:

Unbundling/corporatization: PFC and ADB are providing technical and financial assistance for power sector reforms in the state. Reform-related studies, namely, tariff rationalization, demand-side management, and profit-centre approach to PSEB operations have been initiated.

Privatization of generation/distribution: No significant progress.

Formation of SERC: The government of Punjab notified the constitution of its SERC on 31 March 1999. The Planning Commission has noted that the Punjab Government has expressed commitment to power reforms, and proceeded with a tariff rationalization study. The status of power sector reform in some other states has proceeded much beyond, and Punjab lags behind (Table 11).

It is time that Punjab went ahead and demonstrated its resolve to reforms in the power sector. For a state with the highest per capita power consumption, and also one with its GNTP at Bathinda continuing to win awards for highest PLF (in 1980s), this could be one of the defining differences between the achievement of a flourishing Punjab in 2020, or a 'has been' status.

Table 11
Status of Power Sector Reform in Some Other States

State	Status
Orissa	<ul style="list-style-type: none"> - Reforms Act, passed and OERC set up in 1996. - SEB unbundled into OPGC, OHPC and GRIDCO with four subsidiary distribution companies, OPGC, disinvested. - Distribution companies privatized—51 per cent share of three companies WESCO, NESCO, SOUTHCO given to BSES and of the fourth (CESCO) to AES Corpn. of USA. - World Bank loan -- US \$ 350 million, DFID assistance, 64.5 million Pounds
Haryana	<ul style="list-style-type: none"> - Reforms Act notified in March, 98 and HERC set up on 17 August 98. - HSEB unbundled in August 98 into HVPN (Haryana Vidyut Prasaran Nigam Ltd), a power transmission company and HPGC (Haryana Power Generation Corpn. Ltd) a generation company. - Two distribution companies, Viz.; UHBVNL (Uttar Haryana Bijli Vitran Nigam Ltd and DHBVNL (Dakshin Haryana Bijli Vitran Nigam Ltd) established. - Loan assistance of US \$ 600 million for power sector reforms programme committed by World Bank for 10 years. - Financial Restructuring Study and Asset Evaluation Study by M/s Price Waterhouse Coopers. M/s Arthur Andersen engaged as Reforms Consultants for Corporatization, commercialization and privatization of distribution.
Andhra Pradesh	<ul style="list-style-type: none"> - APERC Act 1998 enacted and SERC set up. - APSEB unbundled into Transmission Corporation of Andhra Pradesh Ltd. (APTRANSCO) and Andhra Pradesh Power Generation Ltd. (APGENCO). - Loan of US \$ 790 million committed by World Bank. US \$ 210 million released. Supplementary technical co-operation Grant of UK Pound 28 million approved by DFID

Source: www.planningcommission.nic.in/sebch5.htm

Trade on the Grid: Central Government Initiatives

After the recent amendments in Electricity Laws, transmission activity has been given an independent status and the concept of Central and State transmission utilities has been introduced. While POWERGRID has been notified as the Central Transmission Utility (CTU), the State Electricity Boards, or their successor state transmission companies, would be the state transmission utilities. It is mandated in the Act that CTU and STU would be government companies. The participation by the private sector in the area of transmission is proposed to be limited to construction and maintenance of transmission lines, for operation under the supervision and control of CTU/STU.

A Power Trading Corporation (PTC) has been incorporated as a Limited Company as per Company's Act 1956 on 16 April 1999, for the purpose of buying power from mega power projects under long-term PPAs and selling it to the beneficiary states also under long-term PPAs. Security to the PTC would be provided by means of a Letter of Credit and recourse to the state's share of central plan allocations and other devolutions. A precondition for purchase of power from mega power projects would be constitution by the beneficiary states of their Regulatory Commissions with full powers to fix tariffs as envisaged in the Central Act. They would also have to privatize distribution in the cities with a population of more than ten lakh.

Draft Electricity Bill

The draft Electricity Bill prepared by the Government of India seeks to provide a legal framework to the reform process and restructure the power sector to bring about transparency, accountability and efficiency in the system. The Bill has suggested the unbundling of the SEBs into independent managed corporations for generation, transmission and distribution, to make them commercially viable. According to the new Bill, SERCs will have to be established within three months of the Act coming into force. It will certainly push the reform programme all over the country and show the direction in which the power sector should move in future. It will also infuse confidence in foreign investors and help bring in more investments in the power sector. The Bill suggests breaking up the existing monopolist structure in the transmission sector and recognizes the need to create a power-pool and allow trading of power like any other commodity. For transmission, the Bill envisages changing the system from that of a monopolistic provider supplying electricity at regulated rates to that of a system where different companies will compete to provide electricity at competitive rates.

Key Points

- SERCs to be set up within three months of the new Act coming into force.
- Corporatized state transmission utility to be established within 120 days.
- Power pooling to facilitate establishment of a spot market for electricity to come into force from the first anniversary of the new Act.
- Generation and transmission projects not to require techno-economic clearance from the CEA.
- Applications for new projects to be processed by the regulatory commission within 120 days.
- CEA's role limited to national planning and technical development.
- All supply to be compulsorily metered within one year of the Act coming into force.

- Central commission to fix generation and transmission tariff; distribution tariff to be fixed by the SERCs. Tariff could be left to market forces to be determined at an appropriate time in future through government direction.
- REBs to be dissolved and replaced with regional transmission centre.

Punjab to be Ready

The Electricity Bill is a clear pointer of things to come, and the Punjab Government should be ready, by taking the envisaged steps right now. These steps include unbundling of generation, transmission and distribution activities. Groundwork needed to take all the stakeholders into confidence must be finalized and completed. Since in the conceivable future, Punjab will always need to purchase power from external sources, it will have to go to the Central Transmission Utility, and buy power through the Power Trading Corporation. Two preconditions are legally mandatory for trading on the GRID:

- Set up SERC, with full power to fix tariffs, and it is obvious that the Central Government will look for demonstrated action in this area; and
- privatize distribution in cities with populations in excess of ten lakh.

The Move Forward – with People Sector Participation

In the 'privatization-is-a-cure-for-all-ills' mind-set, PSP has come to mean Private Sector Participation. Let Punjab give it a new meaning and bring in People Sector Participation in the power reforms arena. We have said that mere privatization is no panacea, but the endeavour should be to pursue efficiency. With this, we also factor in the recent experiences of many states in power reforms. Of note is also the recent agitation in Haryana's Jind district, where government functionaries were held captive by farmers, in response to certain power sector reform issues. It is essential that the power sector reform be made a people's issue, to be achieved through people's participation, and not be seen as a legal / bureaucratic diktat. At present, the reform process is only causing alienation, and becoming one more sore point in government–people relationship. While ultimately the patient of power sector may be cured through reform, why make the medicine bitter, and have a confrontation with the people?

There is also another important issue to be considered. Punjab's current T&D losses are believed to be low, and point to the fact that power theft is not rampant, unlike in Delhi at 47 per cent. That may be so, but where is the need to steal with free power being given to half the citizens comprising the agriculture sector, accounting for nearly one-third of total consumption? It is felt that when SERC finally announces the revised tariffs on the agriculture sector, not only will it raise a resistance to pay, but will also raise the level of theft. In this situation T&D losses will also start mounting. Today, the agricultural sector only enjoys free power, but without theft, but if the reforms are not implemented through the people, they will also become party to theft. This will take the problem of vigilance for the power industry in Punjab to a new level.

Involve Local Bodies

In 2001, a series of workshops on Involvement of Consumers in Power Sector Reforms in Rajasthan, were held by the Centre for Consumer Action Research & Training (CART) at Chittorgarh, Abu Road and Alwar. They involved farmers, rural domestic consumers, members of the Panchayati Raj Institutions, engineers and linesmen from

the local power distribution company, namely, Ajmer Electricity Distribution Company Limited, and from the local district administration. The salient points that emerged were:

- Consumers expressed their willingness to pay if they were given assured quality and quantity of power.
- This was proved by the fact that many of the farmers today have generators and they had estimated that the generating one unit of power through generators cost them as much as Rs. 10 per unit.
- Willing to take collective responsibility – formation of committees to monitor and help in reducing thefts, to monitor the activities of linesmen and bring to the notice of appropriate authorities in case a linesman or engineer/s was found to be corrupt, monitor and ensure bill collections and timely payments, etc.
- People were in favour of installing a community meter outside the village so that theft of power, if any, can be identified and measured. The village-level committee can be formed to take care of that, and some incentives can be given for good results.

The panchayats, zilla parishads, and urban local bodies can become the drivers of power sector reform in Punjab.

Proposed Model

A working model can be set in place as under:

- Retain self-generation at present levels, keeping in mind high costs of generation, and the rising environmental costs.
- Initiate steps to fall in line with the Electricity Bill, and take advantages of the proposed system of trading power on the grid.
- Start an initiative to begin people's participation in the reform process. Engage GOs and NGOs in an exercise of dialogue with the people; SERC can co-ordinate such an exercise. The exercise must be precisely planned, and executed with clear blessings from the highest level. The aim is to build up a consensus for the reforms process by ensuring good quality and assured supply of power at reasonable prices.
- Involve PSEB employees in the reform-related decision-making process. Employees must be told that they will not be forced to quit their jobs.
- Incorporate a power generation utility consisting of PSEB's generation wing. Evolve procedures to decentralize decision-making to this generator, while retaining general policy initiative through the Board level, by retaining majority equity capital share. If possible, disinvest through employee stock option plans, further broad-basing the success factor. Build in procedures to ensure efficiency, with minimum PLF achievement at 80 per cent. *Do not* offer employee-incentives for generation, otherwise plants may refuse to back off, when asked, raising grid frequency to dangerous levels. Rather, build in disincentive for not producing as per target. The disincentive will not apply when the generator is asked to back off by the Regional Transmission Centre.
- Incorporate a power transmission utility, as envisaged under the Electricity Bill. Begin talks with CEA, PowerGrid, and neighbouring states for establishing and participating in the Regional Transmission Centre/s. Evaluate possibility of multi-lateral assistance from national and international bodies for strengthening the

state's transmission backbone. The plan should envisage setting up a transmission backbone for handling the anticipated 68,000 million kwh demand for the year 2020. While Punjab can trade in power from the Power Trading Corporation, it is the state's responsibility to have a transmission tier in place.

Hand over local distribution to panchayats, zilla parishads, and urban local bodies. The transmission company will hand over power at the local sub-stations, in a metered quantity. The following methodology can be considered:

Power is metered in to the local sub-station, and effectively handed over to the local body. The locally available distribution infrastructure is brought on to the books of the local body. The local body becomes a franchisee for distribution, and is paid a fixed *ad valorem* charge for maintenance of its distribution infrastructure, and a percentage commission for collection of user charges. The number of linesmen and other staff required to be stationed should be worked out in advance, along with the fixed contractual remuneration that will be paid. The local body will have to be assured that technical hand-holding will be done when needed.

Employees of PSEB can be offered a VRS proposal, linked with a choice of a village / town in which they would like to be associated with the local body in maintenance of distribution infrastructure, distribution of electricity, and collection of user charges. After VRS, they will be working with the local body for a fixed lump-sum on a contractual basis. Considering the bi-annual 'harvesting' absenteeism in linesmen and other staff, if the scheme is worked out thoughtfully, it is likely to succeed.

Implement rigorous training to local bodies, and the PSEB staff involved, to take on the new role.

Involve the private sector in upgrading of distribution systems wherever necessary. Funds for this will come from the user charges for higher loads, etc., and can be collated at a level sufficiently large enough to offer economies of scale.

The entire package of *ad valorem* maintenance charge, fixed contractual moneys, etc., will be worked out in a financially secure manner, with no input from the government.

- Place a cap on any new recruitment in PSEB, and strictly implement the same. Special VRS offers should be linked to the distribution scheme as mentioned earlier. Re-deployment of staff will be required in accordance with the new corporatized structure.
- Move for long-term PPAs from the Grid, based upon initial experiences.

By exposing the public to the advantages of clean, reliable power supply at reasonable rates (no stabilizers, no inverters, a better quality of life), and with people's involvement at the grassroots through local bodies, Punjab can pioneer the process of reforms in the power sector.

Other Initiatives

Fluorescent lighting: In the domestic lighting sector, people still use incandescent lighting. It would be desirable to impose a higher slab of local tax so that the incandescent bulb becomes an expensive proposition. At the same time, taxes on fluorescent lighting should be brought down to encourage its use, and it should also be

mandated that only electronic ballasts (chokes) are used. This should be coupled with a public awareness programme, and a targeted drive to wipe out incandescent bulbs within a two year period. This step will reduce the total lighting load by a margin of 50 per cent.

Energy saving equipment: It should be mandated by law that for day to day appliances, such as fans, cooler fans / pumps, food processors ('mixies'), agricultural motors, etc., BIS certification is a must. The market is full of cheap, but power-guzzling appliances. They actually cost the buyer much more total life-cycle cost, in a heavy running charges, and place a great strain on the power system of the state. An awareness campaign should be run for this, and manufacturers asked to seek BIS certification for their products. The energy consumption of the product should be compulsorily mentioned prominently for consumer guidance, and surprise checks of products in the shops conducted to ensure that they adhere to the specifications laid down. This should be achieved in a total target time of two years.

The effect of this will be two-fold:

- It will reduce the load on the power system
- It will raise the level of technical competence in the small industry manufacturing sector (fans, pumps, 'mixies', etc.), making Punjab's products better placed to compete in the market.

IT & TELECOM

Considering the very nature of these sectors, they are heading towards convergence, and policy initiatives must address them together, at the same time. Telecom is infrastructure-oriented, and IT represents a value-added service. The networked world has now made it mandatory for IT services to be based on telecom connectivity, since stand-alone IT applications will dwindle in the future. Thus, telecom is largely viewed as providing support for information interchange, and IT represents the basic operating systems, along with the higher level user-interfaces required.

Telecom India

India's 2.16 crore-line telephone network is one of the largest in the world and the third largest among emerging economies (after China and the Republic of Korea). Given the low telephone penetration rate -- 2.2 per 100 people of the population, which is much below the global average, India offers a vast scope for growth. It is, therefore, not surprising that it has one of the fastest growing telecommunication systems in the world, with the system size (total connections) growing at an average of more than 20 per cent over the last four years.

The industry is considered as having the highest potential for investment in India. The growth in demand for telecom services in the country is not limited to basic telephone services. India has witnessed rapid growth in cellular, radio-paging, value-added services, internet and global mobile communication by satellite services. This is expected to soar in the next few years. Recognizing that the telecom sector is one of the prime movers of the economy, the government's regulatory and policy initiatives have also been directed towards establishing a world-class telecommunications infrastructure

in India. The telecom sector in the country, therefore, offers an ideal environment for investment.

The Ministry of Communications, through the Department of Telecommunication & Department of Telecom Services and its undertakings, leads the telecommunication initiative in the country for provision of basic telephone services, national and international long-distance communications, manufacture of complete range of telecom equipment, research and development, and consultancy services. The sector has been progressively opened for private sector participation not only in value-added areas, but even in basic services, National Long Distance/ International Long Distance, and internet telephony. The Telecom Commission performs the executive and policy making functions and the Telecom Regulatory Authority of India those of an independent regulatory body.

A Convergence Bill is anticipated, 'to promote, facilitate and develop, in an orderly manner, the carriage and content of communications (including broadcasting, telecommunication, and multimedia), for the establishment of an autonomous Commission to regulate all forms of communications, and for establishment of an Appellate Tribunal and to provide for matters connected therewith or incidental thereto.'

The Bill proposes to repeal the following legislations.

- The Indian Telegraph Act, 1885.
- The Indian Wireless Telegraphy Act, 1933.
- The Telegraph Wires (Unlawful Possession) Act, 1950.
- The Telecom Regulatory Authority of India Act, 1997.
- The Cable Television Networks (Regulation) Act, 1995.

The telecom sector is thus poised for a major paradigm change, and Punjab should launch itself into a preparatory mode to take care of the advantages likely to accrue from this co-ordinated approach.

The telecom infrastructure in Punjab is as follows:

- Total equipped capacity of 10,52,065 lines.
- Total number of telephone lines working in Punjab Telecom--8,90,495.
- Number of telephone_exchanges—1,004.
- Trunk Automatic Exchange (TAX)--56Klines.
- Subscriber Trunk Dialing facility available from 794 exchanges.

Value-added services available:

- Inet
- Internet
- ISDN
- Paging
- Cellular

Punjab has formulated and announced an IT policy. A reading and analysis of the policy shows that the role of the government in this area is highly over-emphasized, and this anomaly will have to be addressed head on:

Vision statement of IT Policy

'To use Information technology towards accelerated overall development of a knowledge-rich society'.

Information Technology is being viewed as of vital importance by the state because of two main reasons.

- First, IT will be used to enhance quality, reduce costs and improve overall efficiency and effectiveness of the government machinery. IT can enable the government to dramatically re-engineer and improve its processes and services delivery systems for the benefit of the common people. Effective use of IT would bring about much needed radical changes in the functioning of the government, leading to better efficiency, transparency, accountability, and objectivity and ensure 'A better government which is cost-effective and capable of serving the needs of the citizens better.'
- The second reason is economic. IT can dramatically help improve the economy of Punjab, generating more jobs and export revenues. In short IT is an effective tool for catalyzing accelerated economic growth, effective governance and human resource development.

The thrust of the government is towards provision of IT services, and it does not embrace hardware. In this regard, the statement must be complimented on being realistic, by not intending to waste any time and money on trying to establish any hardware initiatives. This clarity is unfortunately lost when laying down detailed objectives for the IT policy. Indeed, India is basically an assembler base, and the funds required for R&D, manufacturing, and marketing of hardware, are not in sight. Globally, the IT network has established itself around R&D in US and Japan, basic mother board level assembly in China / Taiwan, etc., higher level system assemblies in consumer countries like India, and software porting from select source countries. India scores high as a preferred source of software, and Punjab is right in concentrating on and defining HRD as a premier issue involved.

IT is thus to be furthered by:

- Increased organizational efficiency of the government.
- Building a successful domestic IT and knowledge-based Industry and business.
- Producing globally competitive IT-enabled human resources for jobs within and outside India/ Punjab.

The following objectives are laid down by the IT policy:

- Improve the overall economy of Punjab by generating more jobs, as well as domestic and export revenues and ensure, even spread, such benefits to one and all in the state, including the poor and the rural population.
- Create employment potential through human resource development through IT literacy, education and training for creation of high-value employment.
- Empower citizens through deployment of IT, e-governance and freedom of information, particularly in social and public service sectors.

- Provide public-centred governance, which is efficient, cost-effective, transparent, friendly, affordable, convenient, effective and accountable.
- Encourage private-sector participation in IT-related infrastructure and public services on a self-sustaining revenue model basis.
- Make Punjab globally competitive in the globalized, privatized and liberalized economy and the changing business environment of the new millennium.
- Make Punjab a favoured industry-destination for attracting investment from outside the state by creating world-class infrastructure, institutional framework and an enabling environment for the clusterization of high-tech industry in general and IT Industry in particular.
- Turn Punjab into a smart and intelligent state and a knowledge-society through IT-education and e-governance, by promoting knowledge as the key resource for economic progress of individuals and institutions.

The Punjab Government will bring into existence the following frameworks for implementing its IT vision:

e-Institutional Framework

To create the required institutional framework, like the Department of Information Systems and Administrative Reforms, IT-related corporations, joint ventures, agreements, strategic partnerships, etc., for framing the IT strategy, enabling policies, action plans, standards, methodologies, and to facilitate the effective implementation of this IT Policy.

e-Infrastructure

Basic infrastructure: Create world class IT Infrastructure to make Punjab a favoured IT- and knowledge-Industry destination.

e-Governance

To deploy IT for providing an efficient and cost effective government and improve its processes through administrative re-engineering, modernization through IT. This will ultimately lead to the creation of an 'Intelligent' state.

e-public interface: Citizen-IT Interface: Provide a public-service oriented government and improve the public-service delivery. Make information more accessible through an affordable, friendly, shared and widely used IT infrastructure at the front end. Encourage private sector participation in providing IT-based public services. To provide a productive government-citizenry interface.

e-Employment

Employment generation: Generate more jobs in the area of IT and other sectors through rapid development of IT Industry, business and economy.

e-Human Resources Development

Human resources development in IT: Invest in people, tools, methods and partnerships necessary to improve the knowledge and skills of human resources. Produce a high quality and competitive IT-enabled workforce of world-class capability at all levels, who are welcomed as an asset by the IT industry within and outside the country.

e-Education

IT and IT based education: Improve the quality, reach and effectiveness of delivery systems of education through the use of IT. Enhance the value and employability of the youth of the state by equipping them with the knowledge of IT both at school and college levels. Create an IT-friendly culture, enabling a knowledge-based society.

e-Industry

Knowledge industry: Encourage and promote the IT industry by providing an institutional framework and an enabling environment for the clusterization of high-tech industry in general, and IT industry in particular, to strengthen the economy of Punjab. Stress should be on creativity, innovation, entrepreneurship and creation of R&D clusters.

e-Business

Generate more domestic and export revenues through development of e-business for improving the overall economy and thus the quality of life of the citizens of Punjab. Make the state globally competitive through the use of IT to respond quickly to the changing business requirements and border-less marketing.

Paradigm Problems

An examination of these framework statements points to a lack of clear direction to the IT policy, which appears to be an attempt to achieve everything.

- It is alarming to note that the government intends to create a bureaucratic structure of 'Department of Information Systems and Administrative Reforms, IT-related corporations, joint ventures, agreements, strategic partnerships, etc.' This is ostensibly for 'for making the IT strategy, enabling policies, action plans, standards, methodologies and to facilitate the effective implementation of this IT Policy'. Punjab would do well to keep in mind that this kind of bureaucratization is exactly what is to be avoided, and worldwide experience clearly demonstrates that IT producers and consumers remain equipped and capable of providing direction to each other. It is a fact that IT is one industry that grew the maximum, without any such 'framework'-based support from the government.
- The new IT bureaucracy envisages the following:
 - IT Vision Group - The Apex Envisioning Body.
 - Cabinet Sub-Committee on Information Technology.
 - Department of Information Systems and Administrative Reforms (DISAR) IT Resource Acquisition and Disposal Policy.

- Procedure and responsibility for implementation of IT projects.
- IT initiative fund for e-governance.
- Empowered Committee on Computerization (ECC).
- Departmental Committee on IT/ Computerization (DC-IT).
- Punjab IT Corporation.

This level of governmental intrusion into the sector is unwarranted, and is not borne out by the history of the development of this sector worldwide.

- It should also be kept in mind that the Convergence Bill and the Communications Commission of India will provide the necessary regulatory control at the national level, and Punjab would do well to avoid setting up any parallel organizational structure in this regard.
- There is talk of 'clusterization' of high-tech industry. The world over it is clearly proven that it is better to provide a communications network that allows 'de-clusterization' of knowledge workers. It should be possible for a future IT person in a Punjab village to tele-commute to his principal's office in Los Angeles or Tokyo, and conduct business and service transactions.
- There appears to be an idea that we should provide infrastructure in a specific area, get some 'industries' in place within those confines, and climb aboard the IT band-wagon. This is not going to happen, as has been proved in various such 'clusters' developed earlier. In Mohali, a number of corporations have shut shop and given a drastic blow to this whole idea.
- There still appears to be hope of attracting the hardware industry. This should be given up. From computers to televisions, factories have shut shop in Punjab. It should be realized that this is not the most ideal place to invest in hardware. The state will welcome any initiative, but its policy should not be based on this expectation.

Punjab should immediately give up these hackneyed concepts and re-examine its position, factoring in the latest IT industry scenarios.

Give IT a direction

The need for IT in Punjab arises from its near total absence in its most important activities -- agriculture and agro-processing. The success of IT is almost assured if it can address the issues in these areas, and this will provide employment to people becoming surplus from these mother areas.

The Punjab Government should concentrate on the following:

- e-Infrastructure
 - Ensure that from every village upwards, there is reliable broadband connectivity, backed with reliable electricity to keep the telecom infrastructure up and running.
 - Take cognisance of the issues in the Convergence Bill while designing the network
 - Involve the private sector and step in only when unavoidable. And even for these areas, evaluate and execute BOO (Build-Own-Operate) projects.
 - Involve the Panchayats and other local bodies in the management of services for their communities.

- e-HRD
 - Proliferate IT knowledge
 - Introduce computers and IT as a way of life from school onwards, so that the future population is IT-savvy. This will wipe out the digital divide in the state, and build an excellent foundation for advanced IT training.
 - Assist Punjab Technical University, and other training initiatives to impart the latest education, since the obsolescence factor in this area is very high.

- e-Governance
 - Re-engineering of government processes by effective deployment of IT.
 - Any-where, any-time services to citizens.
 - Better accountability, responsiveness and transparency of all systems.

Set an example

In this regard, Punjab should commence upon a targeted and time-bound initiative, bringing e-governance to the citizens' doorstep.

A broad framework that can be adopted is listed below.

Need for IT in social sector

For government: As the corporates are under intense competition, governments around the world are also under tremendous popular pressure to perform better, and in a more professional manner. This necessitates faster processing, decision-making and communication. The systems for delivery of services and grievance-redressal in the social sector have to be efficient and responsive. It is imperative to put in place an IT regime, which is as real-time and on-line as local conditions permit. A simple interface should capture raw data, and a user-transparent processing mechanism should deliver decision-making information to administration. It is often seen that field officers at the district level are forced to spend an inordinate proportion of their time in information collection and transmission. While IT implementation will empower them with quick and reliable monitoring tools on local social-delivery systems, they will also be freed from the usual drudgery of information collection and transmission. The administration will have increased time for positive action, and be able to provide a prompt and positive public interface for grievance-redressal and free and easy access to services and information, while bringing about transparency in the system. Information technology can enhance the capability of the local, regional and top-level governmental machinery and local bodies to make use of relevant information, take informed decisions and plan, execute and monitor in a better and productive manner.

It also needs to be clearly understood that since financing the social sector through government revenues depends upon regulatory issues of excise, taxation, etc., it is necessary to implement effective IT interventions in these latter areas too. While the social sector expenditure and actual results will be analysed in relation to targets, the availability of revenues according to plan to ensure continued support to the social schemes can also be monitored.

For people: The social sector is beset with inadequacies and inequalities. These features are present in many forms, such as inequality of infrastructure, resources, education, employment, development opportunities, etc. This is manifested among the people, societies as well as regions. At the root of these inequalities, more often than not, is the lack of education and accessibility to information. Information technology has the potential of providing prompt and easy access to relevant and quality information and opportunities and occasions to the common man at affordable costs. This is a great tool to bridge the gap and instantly reduce the divide between those who have access to facilities and services and those who do not. This technology has got the potential of proliferating the high-quality services and advanced knowledge for value addition in important matters in the field of education, health, markets, technology, agriculture and a host of other issues. The hitherto restricted treasure of knowledge gets opened up to one and all at the same time, at an equal footing, at a very reasonable cost and with manageable effort. In the present context, there is urgent need to empower the common man with IT in the social sector, and to prevent the syndrome of 'digital have-nots'.

Existing IT intervention

The present IT intervention in the social sector revolves largely around the NIC's NICNET connecting the districts. The exercise is well known, and the relevant data can be taken from NIC. However, being designed essentially as an in-house database, the system has not proliferated to the smaller constituent units, and does not interact with the people. For a meaningful and futuristic implementation, we should now look to the village level, and also keep public-system interface as a priority area.

Measures for Strengthening Existing Practices

Since IT grows in clear jumps, the concept of 'strengthening' cannot be used in the conventional sense. Such strengthening of existing systems is time-consuming, costly, and can never entirely do away with prevalent handicaps. Considering the overall life-cycles of specific information technologies, in both hardware and software, it is prudent to design new systems. These can be extremely cost-effective, and also raise the level of corporate and societal knowledge to current standards. The new system should be proliferated to the village level (in phases), be as real-time and on-line as possible, with ease of use and maintenance. It should stress on transparency, and save the environment by being largely paperless. When implemented well, it can easily pay for itself by cutting administrative costs, while lowering the overall cost of service delivery.

While generic database engines available in the market can be used in the back-office setup, the front end for the user will be application driven. This will cut down training costs, and also reduce time required for actual implementation. The field data on ambient conditions, non-availability or non-reliability of electric supply / transmission media will be studied, and area-specific designs perfected. In the pilot phases, villages with varying degrees of system-hostility – equipment- and attitude-based will be taken up to gain experience for final implementation. It is desirable to build the system at the village level around the existing school, which already has teachers available. The teacher's skill-level will be upgraded for IT basics, and application usage. Since the services and the railways have already implemented IT in a big way, resource persons in the village can be ex-servicemen or ex-railwaymen with IT-exposure. In the event of there being no school, the Panchayat house will be used, with the above-mentioned

resource persons. In case resource persons are not available, necessary training can be imparted to suitable person/s recommended by the panchayat.

It is necessary that IT should not create new costs by employing fresh people, and it must be structured as part and parcel of the job. The requirement is to draw a suitable person from the existing setup, and train him for the job. The jobs that IT will create will be in the IT services sector – software, hardware sales and maintenance, and upgradation. Keeping the above in view, the following improvements over the existing system can be achieved after detailed study:

- System requirements.
- Clients: external and internal.
- System design, networks.
- Processes, inputs, outputs, replies.
- System management, maintenance.
- Feedback.
- The public interface, its user friendliness.
- Generation, sharing and using a information.
- Impact on public and officials, corrections and updatation.
- Innovation, improvement for better results.
- Making it a way of life for staff, public

Area of Use – Monitoring and Evaluation System

IT can be used for a complete monitoring and evaluation of social sector schemes. Detailed possibilities in each area are listed below, including for regulatory bodies, in order to monitor both the schemes and the revenue needed for their financing.

Regulatory Bodies (e.g., Taxation, revenue collection, transport licensing, etc.):

- Providing interface with the people.
- Information and feedback centres.
- Registry, receipt and despatch.
- Feeding the system, the inputs.
- Processing, delivery and follow-up.
- Inputs, outputs and reports.
- Levels of decision-making.
- Status of disposal and pendency.
- Monitoring disposals, time limits.
- Linkage with key functionaries.
- Decisions and replies: putting online.
- Representation, queries and appeals.
- Feedback, impact and corrections.

Development Organizations (e.g., Education, Employment Programmes, etc.)

- Study of a developmental goals.
- Organizational setup to realize it.
- Digitization of the setup, linkages.
- Interface with the beneficiaries.

- Interface with the people's bodies.
- Flow of information, inputs-outputs.
- Analysis, updation, feedback.
- Corrections and modification.

Public Utilities (e.g., Health, Electricity, Water, Sanitation, etc)

- Agenda of the utility.
- People's expectations.
- Resources, infrastructure.
- User charges: rates and recovery.
- Providing the services, monitoring.
- Redressing grievances, replies.
- Quality and competitiveness.
- Response, reporting and feedback.

Monopoly services (e.g. Mandi Boards, etc)

- Agenda, services systems.
- Expectation of clients, users.
- Efficacy in services, bottlenecks.
- Improvements through digitization.
- Inputs, processing and reporting.
- Grievance-redressal systems.
- Reply and responses, feedback.
- Corrections and updation.
- Setting up virtual mandis and commodity exchanges.

Welfare Organizations (e.g., Sainik Boards, Animal Welfare groups, etc)

- Interface with target groups, goals.
- Interface with other organizations.
- Policies, their implementation, monitoring.
- Processing and reporting, feedback system.
- Corrective measures, modification.

Role of NGOs and IT industry

It is important to realize that pure IT organizations cannot conduct effective implementation in the social sector. Non-governmental organizations have the benefit of being close to the people, sharing their experiences and having a feel of the pulse of their perceived needs. At the same time they have the capacity to organize people and also muster assistance from government in their initiatives. NGOs help by working on core issues in the social sector, and focusing to both the government and the people on the pitfalls and the possibilities. There can be partnership between NGOs and IT companies in taking IT to the grassroots.

Focusing Government Initiative

The biggest limitation of a government set-up working in social sectors is the lack of constant presence of its organs at the places where they are supposed to deliver results.

There are issues of staff motivation, skills and information. Consequently, the operation, monitoring and supervision of the activities at the grassroots level needs improvement. Ambitious policies and plans are devised but results do not match targets on account of delayed monitoring, or improper implementation by lower-level functionaries. Leakage of required inputs to non-target groups is another important variable. There are always the plaguing questions of missing links, i.e., low inputs, ill-equipped personnel, poor infrastructure, outdated technologies and inadequate information. Correct and timely feedback thus does not reach the planners and implementers through normal channels, and NGOs fill this vital gap for the government.

Focusing Peoples' Initiative

Individually and collectively, people have the best historical experience and wisdom to identify about the best options for their development and betterment of the services. What they lack is the timely support from the system, better forward and backward linkages and knowledge about the latest methods of value addition. Those who are able to cope with such issues, have taken initiatives for their welfare and have surprised all others concerned. However, a large section is still struggling with the issues which can easily be solved with the induction and adoption of the tools provided by information technology. People's bodies, such as municipalities, panchayats, town areas, co-operatives, marketing and banking institutions, societies, unions and organizations are to benefit immensely if they go this way. In a way, this is becoming essential because they have to deal with large numbers of clients and with multiplicity of information and data.

Possible Intervention of NGOs

Government organizations are busy with issues of governance. Their main concern is to satisfy the public and have a positive impact on their lives. An objective approach and expert input is required to study the real requirements and to suggest solutions. An outside body will view the entire process objectively, rather than looking at it defensively. While the basic requirement of systems largely remains the same for all kinds of public organizations, the finer differences in their objectives and functions require specific solutions. Keeping this in view, strategies may have to be separately evolved for various kinds of public organizations. While the activities may seem to be similar and overlapping, their nature differs when they are implemented in a particular type of organization.

NGOs can also partner an IT organization in inducting IT in social-sector development schemes, and undertake activities of counselling, enabling and supporting public organizations to go digital.

Suitably equipped NGOs can provide the following services:

- Study of key Issues.
- Study of functions and obligations.
- Expectations of the public, clients.
- Processing, delivery and reporting.
- Requirements of policy/statute.
- Requirements of public good.
- Requirements of transparency.

- Systemic strengths and weaknesses.
- Scope of improvement through digitization.
- The actual digital system details, including hardware, software, network.
- The public interface.
- Psychological factors, management of change.

The clear recommendation for the IT sector is to provide the backbone broadband connectivity to village levels, preferably through private initiatives, or through BOO schemes, and other such vehicles, and create a climate of convenience for wooing service providers. This should be built upon by focusing on strength in HRD aimed at this sector. IT should be used to bring about a quantum improvement in the quality of life of citizens, through committed implementation of e-governance programmes, based not merely on automation, but a re-engineering of the government-citizen contact apparatus. Great potential exists in inducting IT into the agricultural and agro-processing sector, and in implementing genuine e-governance.

Note on Commodity Exchange and Virtual Mandis

In this mode of trading a commodity may be 'bought' but delivered at a future date. For instance, if a trader/farmer quotes Rs 7,000 for a tonne of wheat in December 2002 for a delivery to be made in February 2003, the buyer stands to gain if the price of wheat goes up by February. In case prices fall, the trader/farmer harvests the profit. This leaves no scope for big manipulations. The seller is bound to keep his commitment and release the item at the pre-fixed rate. Forward trading bridges the gap between what the farmers get and what is charged from the consumers. So futures trading helps in stabilizing prices in times of shortage, assuring sales at a steady price, and it ensures a continuous supply of commodities.

The Forward Contracts (Regulation) Act, 1952, governs futures trading in commodities in India. According to its provisions, futures trading in commodities can be conducted only by such Commodity Exchanges, which are recognized by the Forward Markets Commission (FMC) under Section 6 of the Forward Contracts (Regulation) Act and have got specific permission from FMC to launch futures trading in specified commodities.

A list of some functioning commodity exchanges in India is given in Table 12.

Table 12
Functioning Commodity Exchanges in India

EXCHANGE	PRODUCTS		
India Pepper and Spice Trade Association, Kerala Email: ipsta@vsnl.com	Pepper-Domestic	Pepper- International	
The Bombay Oil Seeds and Oils Exchange Ltd., Mumbai, Maharashtra Web site: http://www.booe.org , Email: booeind@bom3.vsnl.net.in	Castor oil- International, Rapeseed/Musta rd Oil, Sunflower Oil	Castorseed, Refined Sunflower Oil	Groundnut Oil, RBD Palmolein
The East India Jute & Hessian Exchange Ltd. West Bengal-700001 Vijay Beopar Chamber Ltd., Muzaffarnagar, Uttar Prudish Email: vbc@nde.vsnl.net.in	Hessian Raw Jute-TSD Gur	Jute Goods Sacking	Jute-NTSD
The Chamber of Commerce Hapur Uttar Prudish Email: coc.hapur@optonetwork.com	Gur	Potatoes	
Bathinda Om and Oil Exchange Ltd. Punjab Email: omexbathinda@hotmail.com	Gur		
The Meerut Agro Commodities Exchange Company (P) Ltd. Uttar Prudish	Gur		
SOPA Board of Trade Ltd. Madhya Pradesh Email: sbot@satyam.net.in / sbot@mantrafreenet.com	Rapeseed/Musta rd Oil	Rapeseed/Mus tard OilCake	Rapeseed/ Mustardseed
	Soya Cake Meal	Soya Oil	Soyabean
The Spices & Oil seeds Exchange Ltd. Maharashtra	Turmeric		
The East India Cotton Association Ltd. Maharashtra Email: eica@bom8.vsnl.net.in	Cotton		
The South India Cotton Association Tamil Nadu Email: sicacoimbatore@vsnl.com	Cotton		
The Ahmedabad Cotton Merchants Association Gujarat	Cotton		
The Central Gujarat Cotton Dealers Association Gujarat	Cotton		
The Southern Gujarat Cotton Dealers Association Gujarat	Cotton		
Coffee Futures Exchange India Ltd. Bangalore Karnataka Web site: http://64.176.70.72/cofei.htm Email: cofei@vsnl.com	Coffee-Plantation A	Coffee- Robusta Cherry AB	Raw Coffee Arabica Parchment
Ahmedabad Commodity Exchange Ltd. Gujarat Email: info@acecastorfuture.com	Castorseed		
Kanpur Commodity Exchange Uttar Pradesh	Rapeseed/Musta rd Oil	Rapeseed/Mus tard OilCake	Rapeseed/ Mustardseed
The Rajkot Seeds Oil and Bullion Merchant Association Gujarat	Castorseed		
The Rajdhani Oils & Oilseeds Exchange Ltd. Delhi Email: rajdhanioil@satyam.net.in	Gur		

Source: UNDP Report on Commodity Exchange, 2000

It was surprising to note that Bathinda Om and Oil Exchange Ltd. in Punjab, were willing to exchange e-mails and transact on the Internet.

Punjab should immediately proceed with a commodity exchange framework, with Punjab Agricultural Marketing Board and Markfed, identified as lead agencies, to start the programme. There should be a gradual phasing out of physical mandis as they exist, and replaced by an emphasis on a warehousing system, piloted by the Punjab Warehousing Corporation. Punjab can make tremendous gains with this initiative, cutting out wastage and market congestions, and lowering overall costs.

TRANSPORT

The data on transport statistics are not easily available, and even at the national level, remain a matter of dispute. In fact, it was surprising to note that Economic Surveys of Punjab do not include transport as a sub-head in the sectoral analysis. Estimates for transport output in the country are produced by separate ministries. The data for road transport are released by the Ministry of Surface Transport and for railway traffic by the Ministry of Railways. Both these Ministries question the data for their sectors, released by Planning Commission and the World Bank differs with all of them in this regard, 'The Transport Sector', G Raghuram, *India Infrastructure Report 2001*). We will examine the existing transport infrastructure, the agenda before it and arrive at a blue print for the future.

The average annual compounded growth rate of Gross Domestic Product in Punjab is shown in Table 13.

Table 13
Sectoral Annual Compound Growth Rate of Gross Domestic Product in Punjab

Sector	Sixth Plan 80-81 84-85	Seventh Plan 85-86 89-90	Eighth Plan 92-93 96-97	1998-99	1999-2000	2000-01
Primary	5.37	5.24	3.10	3.06	7.02	2.07
Agriculture	5.44	5.29	3.07	2.92	7.00	1.97
Secondary	5.04	8.65	7.12	11.78	5.90	5.73
Tertiary	5.14	5.22	5.79	4.94	7.74	7.14
Overall	5.23	5.98	4.83	5.79	6.99	4.78

Source: Economic & Statistical Organisation, Punjab

Note: Sixth & Seventh Plans at 1980-81 prices, other at 1993-94 prices

It can be seen, therefore, that the major growth component is in the secondary and tertiary industry sectors at about six per cent and seven per cent respectively. The AACGR of Gross State Domestic Product in Punjab is around five per cent. It can thus be presumed that the transport capacity, both passenger and freight, will have to be doubled over the next decade to accommodate this growth rate.

It is significant that Punjab has one of the highest vehicle density per 100 km of road at 3,102.7; only Delhi, Haryana and Gujarat are higher. Punjab's capital Chandigarh has the distinction of the national highest in this regard at 2,1587 (*Motor Transport Statistics in India*, Ministry of Surface Transport, 2000).

The existing transport infrastructure in Punjab is as follows:

National Highways

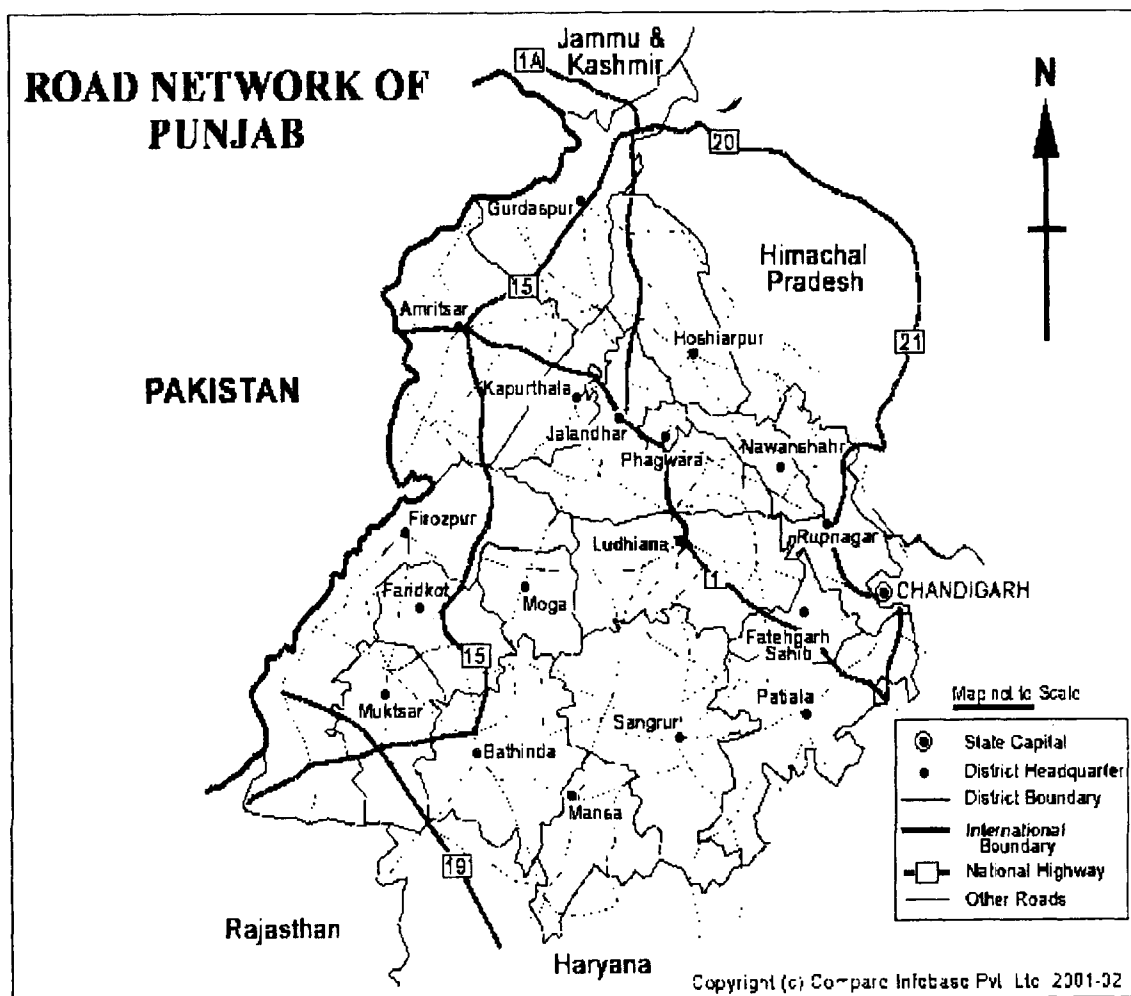
The following National Highways serve Punjab (Table 14):

Table 14
National Highways Serving Punjab

NH No.	From	To	Length (kms.)
1	Shambu (Haryana Boundary)	Ludhiana - Jalandhar - Amritsar - Pakistan Border	279.42
1-A	Jalandhar	Tanda - Mukerian - Pathankot Samba (excluding Himachal Pradesh Portion)	104.734
10	Dabwali (Haryana Boundary)	Malout -Abohar - Fazilka (Pakistan Border)	109.06
15	Pathankot	Gurdaspur-Amritsar-Zira-Faridkot-Bajakhana-Bathinda-Malout-Abohar-Usmankhera (Rajasthan Boundary)	363.67
20	Pathankot	Chakki (Himachal Boundary)	11.975
21	Zirakpur (Excluding U.T. Area)	Mohali-Kharar-Ropar-Kiratpur-GarhaMora (HP Boundary)	76.88
22	Ambala Barrier (Haryana Boundary)	Zirakpur-Kalka (Haryana Boundary)	30.99
			Total = 977 kms.

Source: www.Punjabgovt.nic.in, (PWD Department, B.R.)

The major artery is national highway No. 1, also known as the Grand Trunk Road or Sher Shah Suri Marg. Entering at Shambu, it runs through Punjab, and right accross to the Wagha Border with Pakistan. This connects the major towns of Ludhiana, Jalandhar and Amritsar along with the industrial townships of Sirhind and Govindgarh. A number of state highways also branch of to other major towns, such as Ferozpur, Patiala, Bhatinda, Hoshiarpur, etc.



Map 1

The total length of these national highways in Punjab is 977 kms. These highways are also of a strategic nature, considering the status of Punjab as a border district, important for the defence of the nation. National Highway No. 1 also connects Jammu & Kashmir, approached via Jalandhar and Amritsar. National Highways are maintained by the government of India and serve Punjab well.

State Highways and Major District Roads

These arterial roads, referred to as plan roads, are maintained by the PWD Department of the Punjab Government and are spread over the total length of 7,305 kms. Of these, 2,166 kms are state highways, 1,799 kms are district roads, and 3,340 kms are other district roads. As can be seen from the map, the state highways network is fairly extensive. Some of these roads, owing to their importance, are being elevated to the status of national highways. The important plan roads under this account are likely to be:

- Kiratpur Sahib-Anandpur Sahib-Nangal Road.
- Chandigarh-Patiala-Sangrur-Barnala-Bhatinda Road.
- Kharar-Ludhiana-Moga-Ferozepur Road.
- Ropar-Hoshiarpur-Dasuya-Mukerian-Gurdaspur-Kathua Road.
- Jalandhar-Nakodar-Moga-Sangrur-Patran-Narwana-Rohtak-Delhi Road.
- Bathinda-Fatehabad Road.

Link Roads Connecting Villages

All villages of Punjab are connected by link roads, running for 31,657 km. The standard design is that the link road touches the village, goes around it and leaves to connect the next village. The part of the road going around the village is called 'Phirni', with usually two or three bus stoppages located at convenient points. Rarely do these link roads enter the village. The village is served by brick-laid lanes that connect to the Phirni.

Railways

There are 3,664 track km. of railway track in Punjab. As can be seen from the railway system map of Punjab, the major double line railway artery runs parallel to National Highway No. 1, all the way from Shambhu to Amritsar. From here there are two main branches, one going towards Patiala, Bhatinda, Abhohar and the other moving towards Moga and Ferozpur. The third branch takes off from Jullundhar and moves towards Jammu. There are many other small branch lines connecting the foodgrain-producing mandis of Punjab, primarily to assist in loading and movement of wheat and rice to other parts of India. The capital city of Chandigarh is connected by a line branching off from Ambala and moving towards Chandigarh via Lalru. One of the major sanctioned projects for new railway works under execution by Northern Railway is the Chandigarh-Ludhiana rail link, scheduled for completion upto Morinda junction by 2003.



Map 2

Waterways

There is no planned movement of passenger or freight by using inland waterways. The major river systems of Sutlej and Beas are not found suitable for transportation, the water being effectively used for power generation and irrigation purposes. The well-developed canal irrigation system could have offered some opportunity, but none of the bridges, etc., were designed for permitting any water vessels to move under them. As such transportation by inland waterways in Punjab is negligible, and future growth possibilities uncertain.

Air Transport

Punjab is served by Raja Sansi International Airport at Amritsar and the domestic airport at Chandigarh. There are smaller airstrips at Patiala, Ludhiana, etc., but only Amritsar and Chandigarh are capable of handling large commercial aircraft, with others only capable of small aircraft and helicopters. There are no mass-based air taxi services available in the state. Considering the overall socio-economic scenario and the defence requirements of air space in the border state of Punjab, this sector cannot be banked upon for any mass movement in the near future.

Importance of Road and Rail: An Agenda

Punjab is, therefore, wholly dependent on roads and railways for its transport requirements. It is these two sectors that must provide the necessary transport infrastructure to look after the needs of the state. An agenda for the transport sector in Punjab could be set as follows:

- Considering its length and breadth, it should be possible to move across the state between major towns in three to four hours.
- The state capital houses the legislature, the judiciary and the administrative government centres. In addition, it houses Punjab University, and the Post Graduate Institute of Medical Education and Research. It also has engineering, architecture, medical and management institutes which attract students and professionals.

Thus movements to and from the state capital to other parts of the state will continue to remain important. However, Chandigarh is situated at the edge of the state and, therefore, transport infrastructure must provide a quick and reliable mode, that ensures that people can go back after business in the state capital in the same day.

- One of the largest causes of unnatural deaths in Punjab is road accidents. Transport infrastructure of the future must ensure quick, safe and reliable movement, while enhancing overall speed.
- Punjab will continue to need a large amount of coal for feeding its thermal power plants. Other bulk requirements would remain in the areas of cement, steel and fertilizer. The transport sector should be capable of moving these large quantities towards the consumption centres.
- Considering the strength of Punjab in agriculture, and the push towards agro-processing, the transport sector must facilitate the movement of processed food out of the rural areas to near urban areas for final processing and/or consumption

food. There will also be need to move these quickly out of Punjab towards consumption areas in other parts of India. There would call for the availability of refrigerated containers, called 'reefers'.

- With the advent of virtual mandis, foodgrains and other agricultural products will need to be moved from villages towards aggregation centres, for movement in bulk. The roads must be capable of handling container trucks to facilitate the same.
- With the rapid urbanization of Punjab, expected to touch 43 per cent by 2020, it would be desirable to put in place frequent services between major towns, and suburban transportation systems in the bigger towns of Amritsar, Jullundhar, Ludhiana and Patiala.
- Cycling remains an important mode of transport for distances upto five to six kms. While being good for the health, it also helps protect the environment. On pre-identified routes, leading from surrounding villages of the major towns, dedicated cycling tracks must be put in place to facilitate commuting by cycle. This will also provide market-demand for the well-developed cycle industry of Ludhiana.
- Considering the large number of accidents on the road and related deaths and increasing instances of cardiac diseases, trauma-management will become important in the future. Patients will need quick attention, and transport services should be in place to respond to these health emergencies in the future.

With this agenda for the transport sector, a blueprint for future development can be laid down.

Road Sector

The plan and link-road network is serving Punjab well. However, the design of these roads and technical specifications do not permit regular movement of heavy vehicles. As a result these roads usually become unserviceable during the monsoons, and consume large amounts of money in their maintenance. It is desirable that the concept of life-cycle costing instead of immediate cost should be applied, which will show that the long-term cost of building a more expensive road may be lower than a cheap road with high maintenance cost.

It should also be appreciated, that as in the telecom sector, in the road sector too, the last mile is as important as the major back-bone. It is found that while much attention is being paid to national highways and state highways, the links of these roads to the rural areas leave much to be desired. In a future scenario, where the Punjab Government is targeting growth in agro-processing industries, the village has to be well linked and integrated into the road transport infrastructure, through wider roads that are capable of taking heavier axle loads than at present. The link road also witnesses a large movement of tractors. The tyres of these vehicles are intended for off-road use and, therefore, exert greater wear and tear on metal roads than other vehicles. Therefore, it is all the more important that the village roads are designed well and built to last for taking these demanding loads. A number of road improvement projects are in hand, with commissioning promised shortly (Table 15).

Table 15
Road Construction Projects

Major Road Construction Projects near Completion	Cost Rs. in lakh
Bridge over Choe on Badowan Sardulpur Sakrulli Paldi link road	118.97
Bridge over Langerpur choe on Dasuya Rampur road	115.00
Replacement of old submersible bridge on Patran-Moonak Tohana Road	130.00
H.L. Bridge over Sutlej river creak crossing Pala Megha Pir Berian Road	97.64
H.L. Bridge over river Ghaggar near Makraur Sahib	147.05
Bridge over Sirhind Canal x-ing Ludhiana Chandigarh road near Neelon	233.44
H.L. Bridge over river Ghaggar on Annadana to Nawangaon link road	196.96
Southern Bypass at Ludhiana.	850.00
Ring Road around Hoshiarpur Phase II	250.72
Ring Road around Hoshiarpur Phase II	356.11
Raising/widening Hussainpur Saidpur Mangupur Road Km 0.01 to 13.72	228.02
Improvement of Dasuya Hoshiarpur Road	113.62
Raising Gurdaspur Dera Baba Nanak Road	93.20
Raising Jalandhar Hoshiarpur Road	68.88
Raising Hoshiarpur Phagwara Road (Km 19.20 to 21.00)	80.00
Raising/strengthening Ropar Bela Road (4.00 Kms)	75.00
Raising/Strengthening Dehlon Raipur Gujjar Pakhowal Road	108.00

Source: www.Punjabgovt.nic.in, (PWD Department, B.R.)

Private Participation in Roads

Punjab has invited private parties to participate in the road sector, and has defined a policy with the following salient features:

- The highway sector has been declared as an industry to enable easy borrowing terms and floating of bonds.
- The provisions of MRTP Act have been relaxed to enable large firms to enter the highway sector.
- Customs duty on import of construction equipment has been reduced and procedures streamlined.
- For projects taken up on BOT basis, the state government will permit entrepreneurs to charge toll that market forces will bear.
- The land will be made available at a nominal lease to the entrepreneur taking up the projects.
- The entrepreneur will be permitted to exploit commercial potential of the sites under rail overbridges for a period of 30 years.
- Any other compensation package can also be considered to make the projects viable.

Other features are:

- Invitation of 'Licence Period' competitive bids
- Government will bear the cost of pre-feasibility studies, and acquisition of land for the project will be time-bound. The government may acquire the land through negotiations with the land-owner
- Suitable provision for adjustment of the toll-fee structure for inflation/exchange rate variations.
- Permitting development of highway facilities alongside, to provide predetermined revenue sources for the entrepreneurs within the framework of Rules/Acts.
- Dispute resolution under the Indian Arbitration Act, 1996, in the event of losses arising out of exceptional circumstances or *force majeure*, the government may suitably compensate the entrepreneur on the basis of fair and balanced allocation to risks.

It must be pointed out that there is the usual misconception at work about the role of the private sector in this area. The Government of Punjab says that 'due to resource crunch, it has not been possible to upgrade road infrastructure in the state commensurate with the ever increasing traffic volume'. The issue is not resource crunch, but the absence of a sound technical and economic basis to road sector policy. Under such conditions, the private sector will conduct 'cherry picking', and leave the unprofitable roads in the government sector. The clause of compensating the entrepreneur on the basis of risk is particularly dangerous and amenable to misuse. If the risks are to be borne by the government, then what is the role of private business? A number of projects have already been proposed on the Build-Own-Transfer Model (Table 16).

Table 16
. Road and Rail Bridges

Name of Bridge	Estimated cost (Rs. in lakh)
District Ropar	
Bridge over Kishanpur choe in Km 19 on Ropar Balachaur road	127.00
Rail overbridge at level crossing No. 24-B at Morinda on Sirhind-Nangal Dam Rail Line(Section crossing Ludhiana-Chandigarh road(SH-18) in km 65.100	1756.72
H.L. Bridge over river Sutlej at Kiratpur Sahib	3500.00
District Ludhiana	
Rail overbridge Ludhiana-Dhuri rail line in replacement of level crossing No. 2A/2 near Preet Palace at Ludhiana	2204.00
District Mansa	
Rail overbridge at Mansa on Mansa Sardulgarh Sirasa Road	1000.00
District Bathinda	
Rail overbridge at Bathinda on Bathinda Sirsa Road	1000.00
District Fatehgarh Sahib	
Rail overbridge on Sirhind Chuni Road	335.00
District Sangrur	
Jandali Bridge near Ahmedgarh over Bathinda Branch	70.00
Rail overbridge on Dhuri Bypass	
a) Over Dhuri Ludhiana road	500.00
b) Over Dhuri Barnala Road	500.00
District Gurdaspur	
Rail overbridge on Amritsar Pathankot Road in Gurdaspur town	1000.00
H.L.Bridge over River Beas on Gurdaspur Kathua Road,	4575.00
H.L.Bridge over River Beas on Gurdaspur Mukerian Road,	3550.00

District Jalandhar	
H.L.Bridge over River Sutlej 24 span 25 mtr. each on Mehatpur Sidhwan Jagraon Road	4000.00
H.L.Bridge over Sutlej parallel to Rail-Road bridge 24 span 25 mtr. each near Gidderpindi on Jalandhar Makhu Road	4000.00
District Nawanshahr	
H.L.Bridge 24 span 25 mtr. each including guide bund, etc., on Rahon Mattewara Ludhiana road over River Sutlej	4000.00
H.L.Bridge 24 span 25 mtr. each including guide bund etc. on Rahon Machiwara road over river Sutlej	4000.00
District Patiala	
Rail overbridge 22 No.Phatak Patiala	1500.00
Rail overbridge in Rajpura Town	1500.00
District Amritsar	
Rail overbridge on Amritsar Batala Road near Verka	1200.00
District Faridkot	
Bridge near Abohar Branch on Mukatsar Malout road	60.00
District Kapurthala	
Rail overbridge at Phagwara on Phagwara Nakodar Road.	1000.00
Total	41699.34

Source: www.Punjabgovt.nic.in, (PWD Department, B.R.)

Punjab should propose maximum rail-bridge projects, since, according to a recent policy directive of the Ministry of Railways, they will provide the required 50 per cent of the project cost for all such proposals (Table 17).

Table 17
Road Projects

Name of Road	Estimated Cost (Rs. in lakh)
District Ludhiana	
Northern Bypass connecting Ludhiana-Ferozepur road to Ludhiana-Jalandhar Road	1000.00
Widening/Strengthening of Ludhiana-Ferozepur Road	
a) Four laning Ludhiana Mullanpur Section	2000.00
b) Widening/Strengthening of Mullanpur Jagraon section	1000.00
Four laning of Ludhiana-Chandigarh road	40000.00
District Hoshiarpur	
Widening/Raising of Hoshiarpur-Dasuya Road with H.L. Bridges on choes	2000.00
District Faridkot	
Ludhiana Moga road Section Ajitwal to Moga	1000.00
Four-laning Moga bypass including railway overbridge on ludhiana-ferozepur railway line	1400.00
Four-laning bypass at Mukatsar	200.00
District Sangrur	
Amargarh bypass (23 wide) including cost of land	100.00
District Gurdaspur	
Improvement of Batala-Beas road (Laying B.M. and P.C.)	200.00
District Jalandhar	
Four-Laning Jalandhar Kalassanghian Tashpur road Km 0 to 32.10	3200.00
Four-Laning Phagwara Nawanshahr Balachaur road Km 0 to 48.73	4880.00
4-Laning of Jalandhar Kapurthala Makhu Road	4720.00

District Nawanshahr	
Nawanshahr bypass	1500.00
District Patiala	
Four-laning Bahadurgarh-Rajpura road	1500.00
Raising Banur Tepla road	700.00
Stg. Patiala-Khanauri Road	60.00
District Amritsar	
Four-Laning of Amritsar to Rajasanasi road(Airport)	700.00
Additional bypasses	
Bypass at Banga	1000.00
Bypass at Phagwara	1000.00
Bypass at Balachaur	1000.00
Inter District Roads	
Four-laning of Zirakpur Patiala Sangrur road	3440.00
Ropar Nawanshehar Phagwara Road	3173.00
Kharar Morinda Ludhiana Jagroan Moga road	3744.00
Total	79517.00

Source: www.Punjabgovt.nic.in, (PWD Department, B.R.)

Efforts are also under way to obtain assistance from multi-lateral agencies for four-laning projects, valued at Rs 1,600 crore. These include Zirakpur-Patiala-Sangrur, Rupnagar-Nawanshahr-Phagwara, and Kharar-Morinda-Ludhiana-Jagroan-Moga corridors.

Cycle Tracks

Punjab uses the cycle, and this healthy habit should be encouraged. From about 10 km from major towns, dedicated cycle tracks should lead in, from multiple radials selected on the basis of settlements nearby. At present, the cyclist shares the national highway or district road with heavy and medium vehicles. He risks fatality, and is forced off the road quite often by motorized vehicles. Cycle tracks will relieve road congestion, reduce pollution, and keep up a healthy practice at a negligible cost to government. With the provision of these tracks, demand for Punjab's indigenous cycle industry will also increase.

Fund Generation

Collating funds requirements, it is seen that about Rs. 2,800 crore are needed to upgrade the road infrastructure to desirable standards. The toll-road model is a bag of mixed success, and the initial euphoria over the scheme has been much tempered. While efforts to attract private investment should continue, for Punjab, it is suggested that local taxation on petroleum products should be considered as a route for capital building. The consumption of motor spirit (petrol) and high speed diesel was 5,97,130 and 25,08,438 kilolitres respectively in 2000-2001. (*Economic Survey of Punjab*). There is thus a possibility of raising Rs 300 crore per year by imposing a special cess of just one rupee per litre. The cess should be deposited in a non-lapsable Road Development Fund, which would provide the required capital inflow over the next ten years.

Railway Sector

The railway system should open up three main arteries connecting the rest of the state with Chandigarh:

- Chandigarh-Lalru-Rajpur-Patiala-Sangrur-Bathinda-Malout-Abohar.
- Chandigarh-Morinda-Samrala-Ludhiana-Jagraon-Moga-Talwandi-Ferozepur.
- Chandigarh-Ludhiana-Phillaur-Phagwara-Jalandar-Amritsar.

For this, two projects have to be considered:

- Completion of the sanctioned work of Chandigarh-Ludhiana corridor.
- Fresh sanction and completion of Lalru-Rajpura link.

Punjab should immediately lobby with the Ministry of Railways in this regard. While the target for connecting Chandigarh to Morinda has been laid down as 2003, the final leg to Ludhiana should be commissioned by 2005. For this, land acquisition and other assistance from Punjab should be provided expeditiously.

The railways should also sanction afresh and commission by 2005 the Lalru-Rajpura link, techno-economic surveys for which have already been done.

Table 18 lists proposals for railway development along these corridors.

Table 18
Conceptual Framework for Railway Development along Different Corridors
(With diesel traction), (at current prices)

Corridor	Phase I (2005)	Funds needed (in Rs.)	Phase II (2010)	Funds needed (in Rs.)
Chandigarh-Abohar	Complete Lalru-Rajpura link	100 crore	Doubling of Chandigarh-Bathinda	400 crore
	Upgrade Rajpura-Abohar to 110 kmph	100 crore		
Chandigarh-Ferozepur	Complete Chandigarh-Ludhiana	250 crore (already sanctioned by Railways)	Doubling of Chandigarh-Ludhiana	200 crore
	Upgrade Ludhiana-Ferozepur to 110 kmph	100 crore		
Chandigarh-Amritsar	Complete Chandigarh-Ludhiana	Already accounted above	Line capacity enhancement works on Ludhiana-Amritsar	100 crore

Considering the power-deficit situation in Punjab, it may be desirable to plan for diesel traction mode for train operation on these corridors. The popular perception that electric traction is superior to diesel is not correct. The whole of US and Canadian system is still based on diesel traction. The choice of traction is a techno-economic variable, and should be based on a rational analysis. Considering the overall energy situation, and the

type of requirements in Punjab, it may be desirable to move with the diesel mode for the present on these alignments. This will also lower the cost by upto one crore rupees per km of track.

In Phase I, the funds requirement is Rs 550 crore, out of which Rs 250 crore is already committed by the Railways. In Phase II, the need is for Rs 900 crore. Over the next eight years, fresh funds needed are thus about Rs 1,200 crore.

According to the Railways Act, no local taxation can be applied upon railway services, unless notified by the Central Government, but the possibility of this nevertheless exists. Punjab should propose raising half this sum through a local service tax to be recovered from passengers, originating journeys from within Punjab. The potential to raise fares exists in Punjab, where ticketless travel is a rare phenomenon. A comparison of current road / rail fares is quite revealing (Table 19).

Table 19
Comparison of Current Road/Rail Fares

Corridor	Mail Rail Fare (in Rs.)	Ordinary Bus Fare (in Rs.)
Chandigarh-Bathinda	58.00	99.00
Chandigarh-Ferozepur	64.00	101.00
Chandigarh-Amritsar	62.00	102.00

Thus, bus fares are about 75 per cent higher than rail, and there exists a possibility of increasing rail fares in Punjab through special purpose taxation, without substantially affecting the travel mode.

The Ministry of Railways should be negotiated with to collect the tax and credit it to a Punjab Rail Development Fund to be maintained by them and used for the development of the railway infrastructure in Punjab. It can be so negotiated that the Ministry of Railways would give a matching grant every year, to develop rail corridors as outlined above. Since nowadays Railways ticketing is networked, and a ticket can be purchased from any station, and even on the Internet, special procedures will need to be evolved for crediting the money to the fund. However, since it is already computerized, it should not be difficult to implement it on the reserved segment. Unreserved sales will take place from stations within Punjab, and this can be accounted at these very stations.

At current traffic levels, a 10 per cent surcharge would raise about Rs 60 crore every year, and with a matching support from the Indian Railways, rail development in Punjab can proceed on schedule. It may also be mentioned that the infusion of this investment in the transport sector will lead to large-scale multiplier effect on the overall growth of Punjab's economy.

Multi-modal Approach

There is a prevalence of transport myopia in our planning paradigm and this flows from a compartmentalized and sectoral approach to transport infrastructure. Various modes plan future projects in isolation, and fail to achieve a synergy that would have come out of a multi-modal approach. When a passenger steps out of his home, he uses a pavement to walk on, takes a bus to the railway station, covers part of his journey by

trains and may use a taxi to reach his final destination. It is evident that to the passenger, all are modes of transport and he uses them one after another in the same journey. Problems arise when the planning process fails to see this inter-connection of various legs of a journey, and thus cannot provide a well co-ordinated answer to the passengers' itinerary. This myopic view also causes an adverse effect on the safety aspect. It is of no comfort to the user that an accident is more or less likely to happen in this or that mode of transport. The user would like to be uniformly safe over the various modes that he uses.

Having said that, however, analysis reveals that the roads remain the most unsafe mode of transport. Despite having 1/7th the vehicles per km, road deaths per 10,000 vehicles each year are more than 14 times in India, as compared to United Kingdom. (Ministry of Surface Transport 1998). Poorly maintained roads, in addition to causing accidents, also cause heavy wear and tear on vehicles, and the goods in transit. It has been estimated in various reports that the loss being incurred in such wear and tear is nearly two per cent of Gross Domestic Product. The impact on pollution is also high in such cases. Bad roads and the wear and tear on vehicles lead to low average speeds, subsequently reducing the productivity of vehicles. Users and planners alike in Punjab are aware of these problems. It is essential that we perceive the concept of users, requirements and plan for servicing these in a holistic and multi-modal manner.

Passenger Transport Plan

There are six important movement arteries for passengers in Punjab.

1. Chandigarh-Rajpura-Patiala-Bathinda-Malot-Abohar.
2. Chandigarh-Morinda-Samrala-Ludhiana-Jagram-Moga-Firozpur.
3. Chandigarh-Ludhiana-Phagwara-Jalandhar-Amritsar.
4. Rajpura-Sirhind-Govindgarh-Ludhiana-Jalandhar-Amritsar.
5. Amritsar-Tarantaran-Patti-Jeera-Firozpur-Fazilka.
6. Chandigarh-Rupnagar-Nawanshahr-Hoshiarpur-Pathankot.

Each of these corridors represents distances more than 200 km, with an average of 130 km. The movement represents cross-state moves and is presently largely road based, except on the Rajpura-Ludhiana-Jullundhar-Amritsar corridor, where competing rail services are well patronized. The last corridor is not amenable to rail service, since it is a hilly terrain and would require large infusion of capital for starting fast rail services.

The smaller segments of passenger moves are less than 200 km, and essentially move as a bridge between these major corridors. It is, therefore, suggested that the major corridors should provide reliable and fast rail-based service for moving across the state and between towns on these corridors. The cross-state services should move in the morning towards Chandigarh from Abohar/Firozpur/Amritsar, and return in the evening. Maximum travel time should not exceed about three hours or so. The stoppages on these fast cross-state services will be at the major towns. Suburban services on these corridors, stopping at every station, will provide connection to these services. The frequency of the suburban services can be planned to run at about an hourly interval in the morning and evening and a few services in the intervening hours. Services on less than 100 km segments between major corridors will be looked after by the road sector.

The following essentials should be provided for:

- Common ticketing
 - A ticket purchased for a journey which entails travel on both road and rail modes will be issued as a single ticket providing access to both.
 - An authority to look after road fares, and the issue of joint ticketing, will be formed. A framework to share revenues for railway journeys will need to be decided.

- Multi -modal terminals
 - Road and rail terminals at major towns to be co-located in a manner facilitating easy transshipment. Such services as rest rooms, parking, refreshment areas, etc., can be planned jointly for both modes.

- Use of information technology
 - System information, tracking of road transport moves through GPS, issuing of smart cards, acceptance of credit cards, etc., to be implemented on the network to help customers.

Freight Sector

On date, multiple handling of commodities, rising wastages, and transport cost characterize the freight sector. For example, harvested wheat is stocked in the farmer's house, then brought to the mandi and dumped, then bagged, then transported to a godown, then taken to the railway station and dumped, and then loaded into railway wagons. The reverse is also true for inward commodities for consumption in Punjab. The same multiple handling is true of cement, steel, fertilizers, coal for public use, etc.

In keeping with the thrust sector of the Government of Punjab, a transport system will have to meet the requirements of agro-processing industries too. This will demand assured transit for rural and semi-urban areas to the consumption centres in Punjab and outside, and may also need refrigerated wagons.

Need For Warehousing

In keeping with the need to minimize handling, correctly-sized warehouses will have to be established at the consumption/production centres, and at major railheads in Punjab.

The farmers can be encouraged to bag the wheat at source in their farms, and stock them at the local warehouses. These local warehouses can be reasonably priced and scientifically designed to ensure the stocking of foodgrains, and assist in subsequent movement directly to consumption centres/railheads. At the railheads, commodities moving in for consumption in Punjab can be stocked in the warehouses linked to the rail terminals. Commodities can move directly from these warehouses to the consumption points. The Railways, being the custodians of bulk transport and also having land at most places, should invite the private sector to participate in the management of such warehouses, attached to railheads. It is learnt that schemes are already being readied in the Ministry for such an endeavour.

IT and Telecom a Must

To implement this paradigm of decreased handling, lower wastage and lower overall cost, the freight transport and distribution sector will have to be backed by a reliable IT and Telecom setup. It has earlier been mentioned that the physical market or mandi, should be replaced by a virtual market, where commodity exchanges permit trading on line. The farmer in the village, or a co-operative setup will trade directly with the buyers. At the same time, the village co-operatives and other local bodies and individuals will also be in a position to source their requirements of other commodities, which may be stocked at the railheads, etc.

These schemes can be implemented as pilot projects in one district in the first phase and then proliferated quickly over the whole state. The advantages that will accrue in terms of stemming wastages and lowering costs will bring about a monumental change in the method of movement of distribution of commodities. Additionally, it will open up the entire world to Punjab villages to trade with and become an engine for development.

The implementation of this system will also reduce the overall transport cost by cutting down superfluous moves. For example, when commodities move from the village, during the multiple-handing cycle, they may be travelling repeatedly over the same stretch. In the proposed commodity-exchange, in a virtual mandi situation, there will only be precise movements from one point to another without any repetitive or unnecessary movement. While lowering the cost of transport, this will also reduce the congestion on the road network.

It is also seen that tractors, which are essentially designed for off- road application, move on the roads and provide, initial 15 km. approximately of transport, when moving to the mandi. The design of their tyres places heavy stress on the road surface leading to damage both to the tyre and the road. In the proposed setup, freight movement will be through vehicles designed for this purpose, which will ensure that roads last longer.

Move Towards Containerization

Movement by containers will be the standard scheme in the future. The proposed setup will start facilitating the induction of this modern system in commodity-transport in Punjab. Refrigerated containers, called 'reefers', are now commonly available and can become helpful too in the development of the agro-processing industry in Punjab. Containers will also ensure a seamless movement from production to consumption centres, whether intra-state, inter-state or international.

CONCLUSION

Punjab has pride of place among the states of India and its economic success story has stood out as an example to others. In recent times, the going has not been good, and it is high time that the state moves once again towards a cycle of sustainable growth.

It is anticipated that Punjab will move towards more economic cropping patterns, and into the area of agro-processing. This will be coupled with a conscious effort to develop the knowledge-base in information technology, and other segments of the tertiary sector.

Punjab should announce putting in place an infrastructure base that will help to meet these ambitious requirements. It is recommended that:

1. The state should give up a subsidy-based approach and move towards a techno-commercial basis for infrastructure projects.
2. Realize that users are willing to pay for services, provided the overall quality of services meets their requirements. People would rather pay for good services, than suffer a defective free service.
3. Major reforms should be brought through people's participation, not governmental diktat.
4. Induction of new technologies should not give rise to new bureaucracies, but should result in enhanced service-deliveries through process-re-engineering.
5. While the rural sector will remain important, a policy shift emphasizing the increasingly urban character of Punjab should be built into the decision-making processes.

While specific recommendations with regard to Energy, IT and Telecom and Transport have been detailed, it is strongly recommended that the above-mentioned paradigms should be embedded in the infrastructure-planning process. This will ensure the resurgence of Punjab's infrastructure, propelling it onto a sustainable growth curve.

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Chapter 8

URBAN DEVELOPMENT

TRENDS IN URBANIZATION

Punjab is in the midst of urban transition. At the dawn of the twentieth century, only 12.46 per cent of the total population of the then pre-partition united Punjab was urban. At the beginning of the twenty-first century, the urban population of Punjab has increased to 33.95 per cent, against 27.78 per cent for the country as a whole. Punjab is now the fifth major urbanized state of India after Tamil Nadu (43.86%), Maharashtra (42.40%), Gujarat (37.35%) and Karnataka (33.98%). Table 1 and Figure 1 present the trends in urbanization in Punjab.

Table 1
Growth of Urban Population in Punjab

Year	Total population	Urban population	Percentage of urban population	Decadal growth of urban population (%) / absolute	Total number of UAs/ towns	Annual compound growth rate (ACGR) (%)	
						Total	Urban
1951	9,160,500	1,989,267	21.72	20.02/331,853	110	-	-
1961	11,135,069	2,567,306	23.06	29.06/578,039	106	1.96	2.78
1971	13,551,060	3,216,179	23.73	25.27/648,873	106	1.98	2.27
1981	16,788,915	4,647,757	27.68	44.51/1,431,578	134	2.16	3.75
1991	20,281,969	5,993,225	29.55	28.95/1,345,468	120	1.90	2.57
2001	24,289,296	8,245,566	33.95	37.58/2,252,341	157	1.82	3.24
2011*	29,088,860	11,344,249	39.00	39.00/3,098,683	-	1.82	3.24
2021*	34,836,818	15,607,417	44.80	44.80/4,263,168	-	1.82	3.24

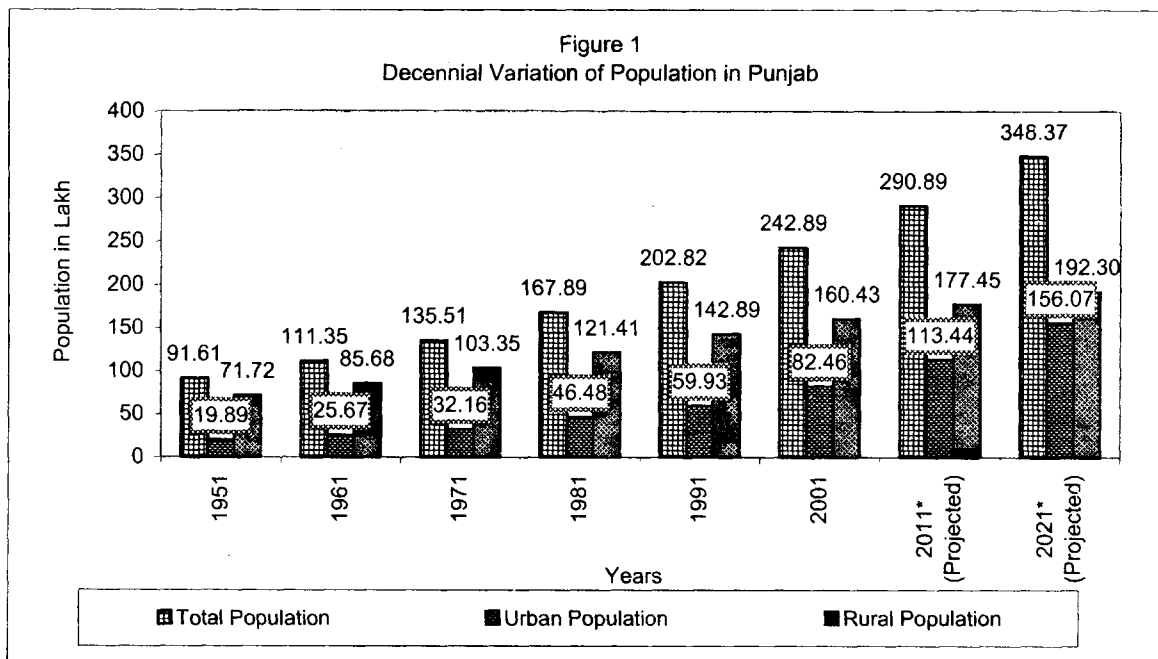
Source: Census of India 1951, 1961, 1971, 1981, 1991 and 2001

Note: *Projections: Based on ACGR of 1991-2001 decade

Today, one out of every three persons in Punjab is urban by residence. It is the most urbanized state of the region and is ahead of Haryana, Jammu & Kashmir and Himachal Pradesh. The ACGR of the urban population is higher than that of the total population.

This has resulted in high population density in urban areas. A number of towns/urban agglomerations have come up during 1991-2001 and distance between towns has decreased due to growth of new towns and expansion of urban area limits. The state has thus witnessed a rapid growth in urban population due to migration from rural to urban areas in search of employment opportunities, health and educational facilities. There was an addition of 22.5 lakh people in urban areas in the decade of 1991-2001, against 13.4 lakh in 1981-91.

The growth of urban population in the various size-categories of towns shows an interesting trend. Large cities and towns (class I and II) have been increasing at a faster pace with a larger population base. Table 2 and Figure 2 depict the growth of urban population in different size-categories of cities and towns in Punjab from 1951 to 2001.



Source: Same as in Table 1

The class I and II towns are likely to grow faster and become over-crowded with higher population densities. Since 1951, Ludhiana city has witnessed a virtual explosion in population growth. During 1981-91, it recorded a growth rate of 71.77 per cent, the third highest among metropolitan towns in India. In 1991, Ludhiana became the first million-plus metropolitan city of Punjab. Amritsar too has acquired metropolitan status and has become the second metropolitan city of the state. One, out of every six urban dwellers (16.92%) in the state, resides in Ludhiana city and one out of every nine urban dwellers (11.83%) in Amritsar city. It is significant that three out of every ten urban dwellers (29.23%) in the state reside in these two metropolitan cities. Ludhiana city has a disproportionately high density of 8,755 persons per sq km, only slightly lower than Delhi.

Table 2
Trends in Urban Population in Different Size-categories of Cities and Towns (1951-2001)

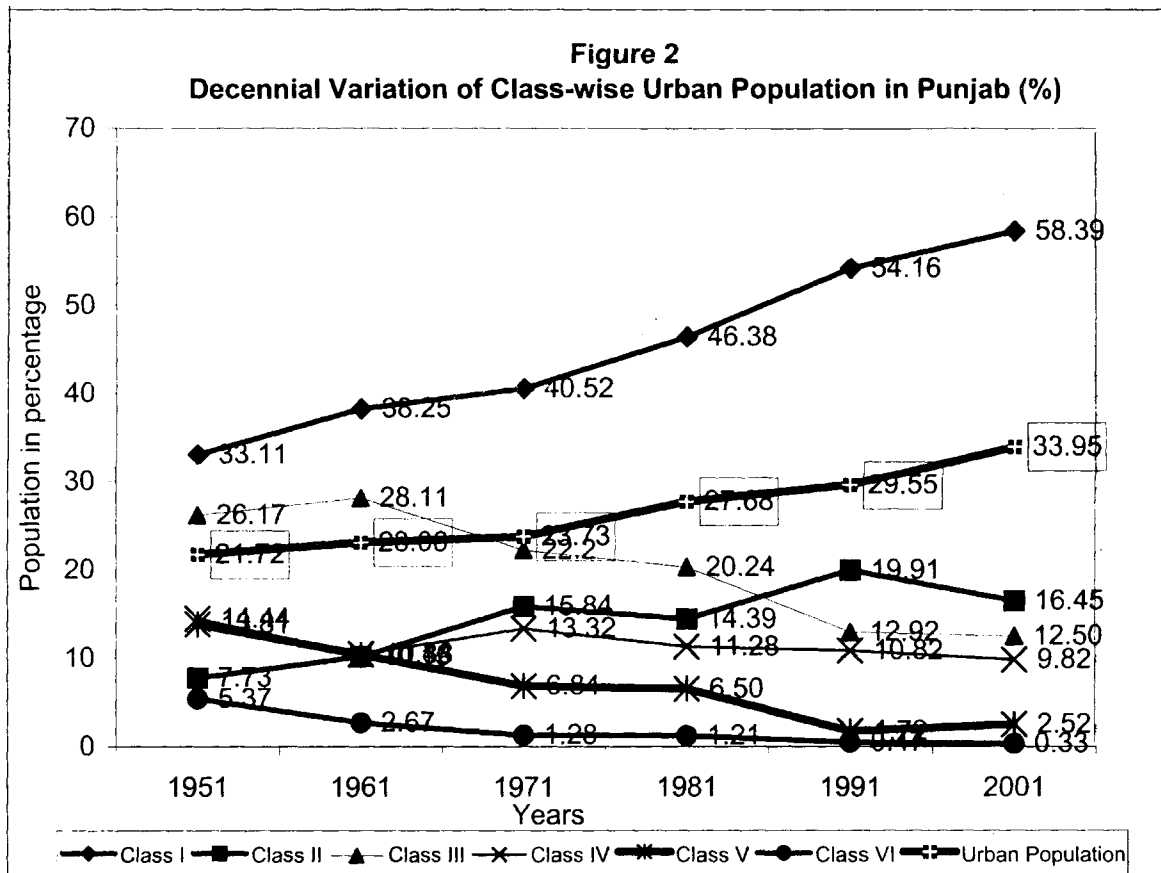
Years	Class I	Class II	Class III	Class IV	Class V	Class VI	All Classes
1951	3 [33.11] (658,725)	2 [7.73] (153,719)	17 [26.17] (520,558)	20 [14.44] (287,223)	36 [13.18] (262,197)	2 [5.37] (106,845)	110 [100.00] (1,989,267)
1961	4 [38.25] (981,890)	5 [10.15] (260,707)	23 [28.11] (721,684)	20 [10.44] (267,913)	35 [10.38] (266,439)	19 [2.67] (68,673)	106 [100.00] (2,567,306)
1971	4 [40.52] (1,303,128)	8 [15.84] (509,389)	2 [22.20] (714,176)	31 [13.32] (428,413)	29 [6.84] (219,911)	12 [1.28] (41,162)	106 [100.00] (32,161,79)
1981	7 [46.38] (2,155,714)	10 [14.39] (668,780)	27 [20.24] (940,482)	36 [11.28] (524,505)	40 [6.50] (301,905)	14 [1.21] (56,371)	134 [100.00] (4,647,757)
1991	10 [54.16] (3,246,224)	18 [19.91] (1,193,171)	25 [12.92] (774,453)	46 [10.82] (648,230)	14 [1.72] (102,945)	7 [0.47] (28,202)	120 [100.00] (5,993,225)
2001	14 [58.38] (4,814,405)	19 [16.45] (1,356,386)	35 [12.50] (1,030,623)	54 [9.82] (809,366)	28 [2.52] (207,891)	7 [0.33] (26,895)	157 [100.00] (8,245,566)

Source: Census of India, 1951, 1961, 1971, 1981, 1991, 2001

- Note:-
- 1) Number of towns in each category (without bracket),
 - 2) Percentage population in each class []
 - 3) Total population in each class ()
 - 4) Size of population:

Class I = 100,000 and above	Class II = 50,000 - 99,999
Class III = 20,000 - 49,999	Class IV = 10,000 - 19,999
Class V = 5,000 - 9,999	Class VI = Below 5,000

Increasing urbanization and the consequent concentration of urban population in class I and class II cities needs to be viewed with concern by urban policy makers. The disproportionate increase in population in these towns in particular and in the other size-categories in general has created huge deficiencies in such civic services, as water supply, sewerage, solid waste management and urban infrastructure, such as housing, transport and roads. Land is becoming scarce in towns and consequently the problem of housing is acquiring serious proportions. Provision of urban basic amenities and upgradation of existing infrastructure for additional urban population has become a challenging task.



Source: Same as in Table 2

Analysis of urbanization in various districts does not present a uniform pattern. Table 3 depicts the district-wise trend of urban population in Punjab. It is evident that Ludhiana, Jalandhar and Amritsar are the top three urbanized districts and Nawashahr the least urbanized district of the state with only 13.80 per cent of population being urban. It must be noted that the districts with a low level of urbanization have started experiencing a decennial rate of growth in population that is as high as in the highest urbanized districts and even higher (Mansa and Fatehgarh Sahib).

Table 3
Percentage of Urban Population to Total Population in Districts

Districts	Percentage of urban population to total population in district		Decadal growth of urban population (%)
	1991	2001	1991-2001
Ludhiana	51.81(20.74)	55.80 (20.51)	36.05
Jalandhar	40.63 (11.19)	47.45 (11.24)	38.28
Amritsar	34.08 (14.25)	40.00 (14.91)	44.01
Patiala	30.49 (7.78)	34.98 (7.80)	38.02
Faridkot	32.95 (2.50)	33.89 (2.27)	24.91
Kapurthala	25.76 (2.78)	32.59 (2.97)	47.14
Rup Nagar	25.82 (3.88)	32.46 (4.37)	55.11
Bathinda	26.98 (4.43)	29.78 (4.27)	32.36
Sangrur	24.80 (6.97)	29.26 (7.09)	39.91
Fatehgarh Sahib	22.17 (1.68)	28.08 (1.84)	50.26
Firozpur	25.70 (6.21)	25.81 (5.46)	20.94
Muktsar	23.40 (2.55)	25.81 (2.40)	29.44
Gurdaspur	21.99 (6.45)	25.46 (6.48)	38.15
Mansa	14.85 (1.42)	20.68 (1.73)	66.84
Moga	19.13 (2.48)	20.04 (2.16)	19.38
Hoshiarpur	17.10 (3.71)	19.66 (3.52)	30.84
Nawashahar	11.00 (0.98)	13.80 (0.98)	38.49
Punjab (Total Urban)			37.58

Source: - Census of India 1991 and 2001

Note: - Figures in parenthesis indicate percentage of urban population of the district to total urban population of the state

Analysis of the spatial pattern of urbanization reveals a trend towards ribbon-development along the major transport corridor such as the Grand Trunk Road (GTR) that acts as the economic spine of the state. Three corporation towns of Punjab are situated on GTR. Urbanization in the state is developing as a corridor, creating a linear pattern running from southeast to northwest with large concentrations of population in class I and class II towns. There is a haphazard growth of slums and large-scale migration is unabated. It is creating physical, demographic and environmental imbalances in the state and generating demand for upgradation of the urban infrastructure and civic services. Presently, the urban infrastructure is in bad shape. It is the worst in small and medium towns. City governments are financially weak because of a host of reasons and are unable to provide adequate services for the growing needs of the citizens. The cities in Punjab, with poor infrastructure, may become unlivable and unproductive. Prioritization of development of small and medium towns/ viable regional growth centres, convergence of programmes to improve physical, social and economic infrastructure are essential, keeping the future scenerio of urbanization in view.

The major concern at present is the critical gap in demand and supply of basic civic services in growing urban areas. Despite augmentation of basic services, housing and urban infrastructure, deficiencies in quantity and quality persist. A higher growth of the state economy will require strong urban-infrastructure support and quality services. The strategies for urban development need to target 100 per cent coverage of urban population with supply of safe drinking water, upgraded sewerage facility, 100 per cent lifting, disposal and treatment of garbage and better housing facilities by the end of the Tenth Five Year Plan. The existing concentrated urban growth would need to be deflected through the development of smaller urban areas that will minimize the flow of

migrants to larger cities. The construction of roads connecting large and small towns and even villages with an adequate and efficient transport system will help to decongest larger urban areas. People will find affordable housing in peripheral towns. This is possible if satisfactory infrastructure with efficient surface transport for commuting is available.

The productivity of cities also depends upon the workforce. Migrants constitute the major workforce. Their contribution to urban productivity is significant, but unable to find a proper living space, they become a burden on the urban infrastructure, as they put up temporary and illegal structures on private and public lands commonly known as slums. The slum and shanty settlements in and on the periphery of towns become a major burden for the urban local bodies (ULBs), as such services as drinking water supply, sewerage and sanitation are provided to them with no or little cost-recovery. The migrant workforce should be provided proper living space and environment for a harmonious growth of population, settlements and resources in urban areas.

Cities are engines of economic growth as they contribute more than 60 per cent of the state domestic product (SDP) in Punjab. With the advent of economic reforms, liberalization and globalization, cities are emerging as important reservoirs of employment and providers of health services, higher education and centres of art and culture. But this positive role of urbanization is overshadowed by the deteriorating urban infrastructure and civic services, and substandard housing. The situation calls for innovative measures for urban development, housing, efficient delivery of services and bridging gaps between demand and supply, starting from small and medium towns to class I and class II towns.

The negative impact of urbanization needs to be mitigated by strategies addressing the major constraints in the provision of urban basic civic services, housing, slum development and poverty alleviation. The state government should prepare an urbanization strategy encompassing an area-specific economic framework, rural-urban linkages, and intersectoral as well as spatial and environmental dimensions of urban development. To counter the severity of urban problems, the modes of solution have to be coherent and comprehensive to address local problems, and cities should be able to meet the needs of the present urban population in such a fashion that it does not affect its future needs.

The goals of urbanization strategy involve strengthening of urban local bodies by transferring funds and functions, adequate/sustainable provision of urban infrastructure/basic civic services, such as water supply, sewerage, solid-waste management, roads, street lights, drainage, environment conservation, housing, land development and transport infrastructure. Capacity building of elected and appointed representatives of local self-government and other urban managers is one of the major constituents of the urbanization strategy and a prerequisite for institutional development and functional strengthening of ULBs. The urban strategy must emphasize creation of an enabling legal, financial and regulatory framework for urban development, housing and poverty alleviation. Since state budgetary support, central government transfers and tax base of ULBs are inadequate, the urban strategy should suggest ways and means of mobilizing resources from non-budgetary sources, i.e., funds from the capital market through bonds and other alternative sources of financing.

URBAN GOVERNANCE, DEMOCRATIC DECENTRALIZATION AND INSTITUTIONAL SET-UP FOR URBAN DEVELOPMENT

Local governments under the Constitution of India, belong to the domain of the state governments, as they are listed in List II in the Seventh Schedule. Hence, they have historically been operating within the control system of the state governments and have very little financial and functional autonomy.

The ULBs in Punjab, numbering 134, are governed by the Punjab Municipal Act (PMA), 1911 and the Punjab Municipal Corporation Act (PMCA), 1976, as amended in 1994, to bring the two Acts in conformity with the Constitution (74th Amendment) Act, 1992 (CAA). The Punjab State Assembly has passed the Punjab Municipal Bill, 1999, which has, to some extent, broad based the functional scope of the ULBs. It is awaiting assent of the President of India.

CAA is a milestone in the history of urban governance. It provides and stipulates that:

- Municipalities are to function as 'institutions of self-government', prepare 'plans for economic development and social justice', perform functions and implement schemes as entrusted to them by the state governments including functions listed in the Twelfth Schedule [Article 243W (a)].
- With a view to reducing the distance between the local communities and the local government, CAA provides for the constitution of Wards Committees (WCs) in the cities with a population of three lakh or more [Article 243S(1)].
- The State Election Commission is to superintend, direct and control the preparation of electoral rolls, and conduct elections to the urban local bodies [Article 243K (1)].
- The State Finance Commission is to review the financial position of urban local bodies and make recommendations to the state government regarding (i) the 'principles' which should govern the distribution of resources between the state and the local bodies, the determination of the revenue sources to be assigned and appropriated by the local bodies, and the grants-in-aid from the State Consolidated Fund; (ii) the 'measures' needed to improve the financial position of ULBs; and (iii) any other matter as the Governor may refer to it in the interest of sound finances of the local bodies [Article 243Y (1)].
- The District Planning Committees (DPCs) are required to be constituted to 'consolidate' the plans prepared by the Panchayats and the municipalities of the district and to prepare a draft development plan for the district as a whole [Article 243ZD(1)].
- The Metropolitan Planning Committees (MPCs) to prepare draft development plans for the metropolitan areas concerned as a whole [Article 243ZE (1)].

The scheme of the CAA provides for regular and fair conduct of elections. If an ULB is superceded before the expiry of its term, elections shall be held within a period of six months. The Election Commission was constituted in compliance with the provision of the CAA, and two elections to local bodies have been held in Punjab. The First State Finance Commission (FSFC) was set up in 1994 and the Second State Finance Commission (SSFC) in 1999. The recommendations of the FSFC have been accepted by the state government for fiscal transfers and the recommendations of the SSFC are presently under consideration. Though reforms towards democratization of ULBs have been set in motion, the devolution of functions to be performed by ULBs of different sizes, transfer of funds to match these functions, and the system of accountability, is left to the wisdom of the state government.

Recognizing the neglect of integrated urban development planning by the local authorities, the CAA incorporated, inter-alia, functional decentralization to enable the ULBs to discharge effectively their responsibilities, suitable to contemporary urbanization and a participatory planning process to promote convergence of resources. The state government needs to introduce improvements to overcome structural deficiencies in the generation of revenue from such conventional sources, as property tax, octroi, user charges, license fees and from profession tax, land-based taxes and funds through municipal bonds etc., Also, the financial base of ULBs could be augmented through better tax administration and adoption of an appropriate mechanism for rationalizing the pricing of basic civic services. Since provision of municipal services rests with the ULBs, there is need to seriously implement the reforms as envisaged in the CAA. The suggested ways and means as discussed in subsequent sections need to be executed and monitored regularly.

Functional Domain of Urban Local Bodies

The functional domain of municipalities in Punjab suffers from lack of clarity. It lacks stability, as, over time, the functional responsibilities of the municipalities have either been modified, deleted or taken over by the state agencies and fragmented amongst several agencies.

The Twelfth Schedule of the Constitution contains an illustrative list of municipal functions for transfer to ULBs. In Punjab there has been no change in the functional domain of ULBs in the post-CAA regime. No doubt, the transfer of functions listed in the Twelfth Schedule is not mandatory, but the intention to transfer these is clear. For enabling the performance of the functions listed in the Twelfth Schedule, the Constitution provides for supplementing local revenues through transfer of funds from the state government, sharing of state taxes and assignment of taxes and grants-in-aid, specific or general. The CAA thus envisages transfer of functions and finances to the municipal bodies to enable them to act as city-level governments for discharging mandatory, core and other civic functions delegated to them.

Presently, the State Municipal Acts make the bureaucracy the supervisory and controlling authority of the municipal bodies. Though the Constitution envisages empowered units of self-government, the executive powers vest with the appointed bureaucrats. This is against the ethos of self-government. Elected members of the municipal bodies feel that the executive wing (appointed representatives) of the state government is influenced by the Members of the Legislative Assembly (MLAs) and Members of Parliament (MPs) who look upon elected members of the local municipal bodies as trespassers in the game of power sharing. Vesting of executive powers with appointed functionaries come handy in such a system of control and authority. Devolution of functions and tax authority and fiscal autonomy to ULBs, therefore, demand a fresh look at the existing laws and, above all, a strong political will to translate the spirit of CAA.

Fragmented functioning is illustrated by the performance of such parastatal agencies as Punjab Water Supply and Sewerage Board (PWSSB), State Urban Development Agency (SUDA) and Improvement Trusts. These organizations have encroached upon the local functional domain of ULBs. It is time that the functions of parastatals are transferred to the elected municipal bodies who, after two elections since 1994, have attained enough maturity to perform these functions. Parastatal institutions should be subordinate to ULBs and at best act as consultants to them till abolished.

The recommendations of the FSFC pertaining to revenue assignment, sharing of taxes and grants should be implemented in full, to enable the ULBs perform their functions efficiently in general and in the delivery of municipal services in particular. There should be no interference by the State Government in such municipal affairs as fixing of rates, rents and user charges and granting exemptions to pay taxes. This will make local governments strong and close to the people, and the local polity vibrant and alive.

The Wards Committees, District Planning Committees and Metropolitan Planning Committees, mandated by the CAA, should be constituted. It is time to introduce the Mayor-in-Council system (or President-in-Council) in ULBs, to strengthen functioning of local democracy through elected representatives.

Functional and Institutional Development of Local Self-government through Education, Research and Training

Training and human resource development, backed by research, have a key role in strengthening the ULBs to cope with the challenges in the context of the 74th CAA. Capacity-building of elected representatives of ULBs will help in institutional development and functional strengthening of local self-government. The strategy for capacity-building of urban administrators/managers includes realistic assessment of human, financial and technical resources required by ULBs. The elected and appointed officials of ULBs should be aware of the salient features of the 74th CAA, the institutional/organizational set-up, preparation and implementation of development plans, innovative municipal management through people's and private sector participation and regulation of the private sector in the delivery of municipal services. An orientation for raising funds through internal resources, borrowings from institutions and the debt market are the other essential features of the training of functionaries of ULBs. Managerial skills of about 5,000 senior, middle and junior level elected and appointed representatives need to be upgraded, for maintaining the tempo of growth and good governance in 134 local bodies, including four municipal corporations.

Fiscal Domain of Urban Local Bodies

The resources of ULBs comprise internal sources (tax and non-tax revenues) and external sources (borrowings and grants-in-aid/share in state taxes and transfers from the Central Government). Articles 243X, 243Y and 280(3) (c) of the Constitution of India are relevant for strengthening the fiscal domain of ULBs. Progressive devolution of fiscal authority will address the existing mismatch between functions and resources.

Sections 61 of PMA, 1911, and Section 90 of PMCA, 1976, deal with taxation powers of ULBs in terms of taxes and fees. Though a number of tax and non-tax sources have been mentioned in these Acts, octroi, property tax and water supply and sewerage charges are the major sources of income of ULBs. Octroi, a buoyant source of income, was abolished from 1 December 2001, except on electricity. The exclusion of octroi had a significant negative effect on the revenue base of ULBs. However, the Hon'ble High Court of Punjab and Haryana has provided a fiscal reprieve by reinstating the levy of octroi and it is being collected by ULBs since 29 April 2002.

Property tax is the next major source of income of ULBs, but its contribution continues to be meagre, due to a variety of reasons, including exemptions on self-occupied residential properties (from 1 April 1997 onwards), poor and discretionary valuation, deficiencies in assessment and collection procedures and a faulty rate structure.

The next important contributor to municipal income is water supply and sewerage charges. 'User charges' from water supply and sewerage have a small share in the total income. This is due to a host of reasons, such as faulty pricing and poor cost recovery, system losses, theft, excessive energy consumption, poor billing and collection, high capital cost and non-volumetric supply of water. Other sources of revenue are not consistent and adequate to meet the growing demands of ULBs for infrastructure development and rising wages and salaries.

Profession tax provided for in the PMCA, 1976, and PMA, 1911, development tax in the PMCA, 1976, and scavenging tax and tax on menial domestic servants in the PMA, 1911, are not yet levied by ULBs. Income from entertainment tax (show tax), levied by ULBs in addition to the entertainment tax charged by the state government, is negligible. Other sources of non-tax revenue, comprising license fees for various trades, licenses, slaughter house fee, building application fee, tehbazari (rent for temporary occupation of vacant municipal land on road-side), sale proceeds and rents of municipal properties, interest on investments, fees, fines and charges for performance of statutory and regulatory functions, are nominal and do not have much impact on strengthening the finances of ULBs. Borrowings, with the approval of the state government, have been mainly confined to loans from the Housing and Urban Development Corporation (HUDCO) and the Life Insurance Corporation (LIC) for water supply and sewerage projects through PWSSB. Except Ludhiana Municipal Corporation (LMC), which issued bonds for rupees (Rs.) 17.84 crore in 1999 through private placement, no ULB in Punjab has raised any loan from the capital market.

ULBs receive 'transfers' and 'grants' from the State and the Central Governments, which are highly erratic and unpredictable, depending upon the exigencies of the state's own financial resources. Own revenues of ULBs are not sufficient to meet the growing demand of basic civic services and the urban infrastructure. The fiscal domain of ULBs continues to remain weak and deplorable. Article 243X of CAA provides that the state government may, by law, authorise a municipality to levy, collect and appropriate such taxes, duties, tolls and fees and assign them such taxes, duties, tolls and fees as levied and collected by the state government. It also provides for making grants-in-aid to the municipalities from the Consolidated Fund of the state.

Income and expenditure of municipalities -- The income and expenditure of urban local bodies is dependent on:

- Adequacy of tax base and its effective exploitation by ULBs.
- Effective use of non-tax sources, such as user charges and land-based non-property taxes.
- Transfers from higher levels of government.

Income of municipalities: Income of municipalities from tax and non-tax revenue sources, capital receipts and transfers from the State and Central Governments from 1996-97 to 2001-02 is given in Table 4. It shows remarkable financial self-sufficiency of ULBs from their own sources. Their dependence on fiscal transfers is negligible. It is worth noting that the generation of revenue from own sources has been increasing in subsequent years despite several populist measures of the state government to abolish local taxes. This suggests that if tax authority is devolved to ULBs and they are given fiscal autonomy, the fiscal constraints presently being experienced by them will ease substantially. Table 4 also reveals distress signals. Revenue from property tax and user charges has been depleting over the years as a proportion of total local revenue. It also indicates a very subdued role of fiscal transfers. This is largely because the income of

urban local bodies in the form of share in taxes is not in accordance with its recommendations of the FSFC and so is the case of transfer of grants to ULBs as recommended by the Tenth Finance Commission (TFC). It is not regular and predictable. Urban development projects of local bodies are affected because of absence of assured quantum of grants and share of taxes according to the recommendations of the State and the Central Finance Commissions. Powers of municipalities, as stated by the FSFC, are severely inhibited by state control. A municipal council cannot raise loans without the sanction of the state government, if the amount exceeds rupees five lakh under the Local Authorities Loan Act, 1914, which is a central legislation. The PMCA, 1976, also provides for borrowing by the municipal corporation for specified purposes within the ambit of the Local Authorities Loan Act. This adversely affects the fiscal autonomy of ULBs.

Table 4
Total Revenue Income of Urban Local Bodies from 1996-97 to 2001-02
(Rs. in crore)

Items	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
1. Tax Revenues						Estimates
a) Octroi	217.63 (55.83)	226.45 (52.82)	271.65 (54.27)	406.69 (59.57)	456.82 (55.53)	531.72* (61.03)
b) Property tax	34.7 (8.90)	34.92 (8.15)	42.42 (8.47)	54.31 (7.95)	66.73 (8.12)	66.64 (7.65)
c) Share from auction money and excise duty on liquor	41.34 (10.61)	43.71 (10.20)	45.04 (9.00)	38.34 (5.62)	63.44 (7.71)	60.99 (7.00)
d) Others	2.75 (0.70)	4.26 (0.99)	4.31 (0.86)	3.51 (0.51)	3.07 (0.37)	3.50 (0.40)
e) Total (a+b+c+d)	296.42 (76.04)	309.34 (72.16)	363.42 (72.60)	502.85 (73.65)	590.06 (71.73)	662.85 (76.08)
2. Non-Tax Revenues						
a) Water supply & sewerage charges	30.05 (7.71)	31.18 (7.27)	38.04 (7.60)	43.68 (6.40)	57.73 (7.02)	59.62 (6.84)
b) Others including capital receipts	43.31 (11.11)	44.29 (10.33)	56.92 (11.37)	87.63 (12.83)	101.52 (12.34)	112.12 (12.87)
c) Total (a+b)	73.36 (18.82)	75.47 (17.60)	94.96 (18.97)	131.31 (19.23)	159.25 (19.36)	171.74 (19.71)
3. Revenues from Own Sources						
Total (1e+2c)	369.78 (94.86)	384.81 (89.76)	458.38 (91.57)	634.16 (92.88)	749.31 (91.09)	834.59 (95.79)
4. Share from taxes as per recommendations of the FSFC	--	36.26 (8.46)	10.82 (2.17)	13.18 (1.93)	17.78 (2.16)	--
5. Grants:						
a) As per recommendations of 10th & 11th Finance Commissions	--	--	7.65 (1.53)	9.56 (1.40)	5.74 (0.70)	10.95 (1.26)
b) For Centrally Sponsored and State Plan schemes	18.89 (4.85)	5.4 (1.26)	22.42 (4.48)	23.75 (3.48)	45.77 (5.56)	23.25 (2.67)
c) Others	1.14 (0.29)	2.24 (0.52)	1.3 (0.25)	2.1 (0.31)	4.01 (0.49)	2.4 (0.28)
d) Total (a+b+c)	20.03 (5.14)	7.64 (1.78)	31.37 (6.26)	35.41 (5.19)	55.52 (6.75)	36.6 (4.21)
6. Total Revenue (3+4+5d)	389.81 (100.00)	428.71 (100.00)	500.57 (100.00)	682.75 (100.00)	822.61 (100.00)	871.19 (100.00)

Source: Report of the Second Punjab Finance Commission (2002) and Local Government Department, Punjab

Note: 1) Figures in parentheses indicate % age to total revenue income in respective years.
2) *Revenue from octroi for the year 2001-02, includes grants of Rs. 140.51 crore against losses, on account of abolition of octroi (1 December 2001 to 31 March 2002)

An item-wise analysis of various sources of income in the context of the recommendations of the FSFC, the TFC and the Eleventh Finance Commission (EFC) is presented below. An effort has been made to give suggestions for enhancing income from these sources.

Octroi: In view of a very high estimate of financial resources required for augmentation of basic urban infrastructure and services, abolition of octroi is not advisable. It is the only local tax with buoyancy and elasticity. Nevertheless, the existing drawbacks in its administration need to be addressed. An array of concessions and exemptions given to several goods and commodities needs review. The measures mentioned below could, therefore, be considered:

- Switching over progressively from the age-old practice of assessment of octroi on 'weight basis' to 'ad valorem basis'. This is equitable.
- Computerization of major check-posts, with connectivity with a central point, to reduce malpractices and improve octroi collections through quick monitoring.
- Effective transit pass system, by feeding into the computers the description of goods and vehicles entering the towns and its transmission to the octroi posts at the exit point to
- check misuse of transit passes.
- A bench-mark for octroi staff and its monitoring to improve their efficiency and introduction of incentives for employees and informers are other measures for improving octroi collection.
- Leakage of revenue on account of under-invoicing in bills can be plugged by random checking of vehicles and co-ordination with the sales tax department.
- Private sector participation in octroi collection can enhance income from octroi through the implementation of an efficient and leak-proof system, better tax administration and application of low-cost modern techniques.

A recent study of Ludhiana Municipal Corporation by the Centre for Research in Rural and Industrial Development (CRRID), conducted by Gupta and Teotia (2001), indicates that LMC has achieved significant growth in income from octroi by implementing these measures and through effective tax administration. Table 5 shows the comparative picture of revenue from octroi in municipal corporations and municipal councils/nagar panchayats (MCs/NPs).

Table 5

Income of Urban Local Bodies from Octroi from 1996-97 to 2001-02 (Rs. in crore)

Year	MCs/NPs	Municipal Corporations				Total	Grand Total
	(A)	(B)				(B)	(A+B)
		Ludhiana	Amritsar	Jalandhar	Patiala		
1996-97	101.15 (46.48)	54.12 (24.87)	26.96 (12.39)	25.84 (11.87)	9.56 (4.39)	116.48 (53.52)	217.63 (100.00)
1997-98	101.73 (44.92)	58.68 (25.91)	29.86 (13.19)	28.1 (12.41)	8.08 (3.57)	124.72 (55.08)	226.45 (100.00)
1998-99	123.09 (45.31)	73.49 (27.05)	34.77 (12.80)	31.26 (11.51)	9.04 (3.33)	148.56 (54.69)	271.65 (100.00)
1990-00	182.84 (44.96)	114.18 (28.08)	46.97 (11.55)	50.28 (12.36)	12.42 (3.05)	223.85 (55.04)	406.69 (100.00)
2000-01	226.64 (49.61)	117.26 (25.67)	50.11 (10.97)	50.78 (11.12)	12.03 (2.63)	230.18 (50.39)	456.82 (100.00)
2001-02	264.17 (49.68)	145.5 (27.36)	44.95 (8.45)	63.24 (11.89)	13.86 (2.62)	267.55 (50.32)	531.72 (100.00)

Source: Local Government Department, Punjab

Note: Figures in parentheses indicate percentage share in the total income from octroi in a particular year

Income from octroi in Amritsar, Jalandhar and Patiala Municipal Corporations and other MCs/NPs has not shown adequate growth. The income of LMC has increased substantially and it is more than the total income of Amritsar, Jalandhar and Patiala Municipal Corporations put together. The measures adopted by LMC to enhance its income can be adopted by other corporations and municipal councils.

Property tax: Besides octroi, property tax (PT) constitutes the most important municipal tax in Punjab. Entry 49, read with Entry 5 of the State List in the Seventh Schedule of the Constitution of India, enables the ULBs to levy tax on land and buildings. ULBs in Punjab do not charge PT on all types of properties, and a large proportion of these are exempted. These include self-occupied properties, schools (even those receiving 95% grants from the state), many charitable and religious institutions and central government organizations and institutions. According to the FSFC, growth of income from PT is constrained by existing rent control laws. The Commission noticed several deficiencies in fixation of tax base, tax rate, tax assessment, tax collection, tax exemptions/concessions and lack of uniformity in the laws for municipal corporations and municipal councils. Though Punjab has liberalized its Rent Control Legislation to make it fall in line with the Model Rent Control Law, 1992, of the central government, the desired result of boosting tax revenue, as a result of changes in the formula for determining the standard rent, have been limited, as most of the old high-priced inner city properties have continued to be assessed at a very low rateable value. As a part of strategy to reform PT, the FSFC gave certain recommendations to strengthen the fiscal domain of ULBs, which have not been implemented so far. Even for exemptions declared by the state government in 1994, no compensation has been given to ULBs.

Property tax reforms: Income from PT has potential and its administration should be streamlined for a higher yield. The tax base, tax rate, tax assessment, tax collection, tax exemptions and resolution of disputes are important aspects of property tax

administration. According to the guidelines for PT reforms prepared by the Ministry of Urban Development (MOUD), Government of India (GOI), a good PT structure should have the following characteristics:

- A low rate of tax to make it acceptable.
- Assessment and collection should be simple and transparent.
- Equity between different classes of tax payers.
- Minimum discretion of assessors.
- Facilitating self-assessment by owners/occupiers.

Taking into consideration the host of administrative and legal reasons behind a subdued revenue productivity of the existing annual rental value system, a consensus on 'area based' property tax, which has stood the scrutiny of the courts, has now generally evolved. The Hon'ble Supreme Court of India has held, in CWP No. 888 of 1996, that the 'property tax is the principal source of income of the urban local bodies. It is unfortunate that the property taxes are levied at very low rates, which have been generally rent based and not revised for five years. Regrettably, large-scale exemptions and concessions are given to property holders. A lot of disparity is also seen in the manner of assessment of property tax. There is a need to have area based property tax reforms to make the system of assessment rational, transparent, simple and fair with minimum exemptions'. The EFC too has expressed similar views and highlighted, in particular, the need to improve revenue mobilization by ULBs through reforms in this local tax.

Property tax models operating in Patna, Ahmedabad, Tamil Nadu and Andhra Pradesh are worth looking at for reforming this tax in Punjab. The Hon'ble Supreme Court of India, in a recent judgment on the Andhra Pradesh PT system, has upheld the area detail system of property tax, provided the methodology and the procedure of valuation and assessment of rental value are stipulated in the municipal laws. Property tax in Punjab, therefore, needs to be refurbished by providing for determination of annual rental value on the basis of location, quality of construction, age and use of land and buildings, by stipulating the methodology and procedures to be followed, as in Andhra Pradesh. The depressing effect of rent control laws on property valuation could thus be eliminated and PT could be made a buoyant and elastic source of revenue.

Innovative practices in valuation and assessment and also in tax administration as well, would need to be adopted. These include the use of Geographical Information System (GIS) for tax mapping, valuation and tax collection, computerization of PT records for effective billing and collection, delivery of PT bills through courier, a scheme of incentives and penalties for tax payers to enhance collection ratio, and strict monitoring of tax collection through ABC Analysis. Increasing demand for augmentation of basic urban services in the wake of rising urbanization is too serious a phenomenon to allow populist measures of large scale tax exemptions, deficient tax system, defective system of valuation and poor collection.

In Punjab, according to a CRRID study (Gupta and Teotia 2001), LMC has gone in for several innovations as discussed above. It has enhanced its income from PT from Rs. 14.06 crore in 1997-98 to Rs. 32.41 crore in 2001-02. The comparative growth of PT in Ludhiana, Amritsar, Jalandhar and Patiala Municipal Corporations and MCs/NPs is shown in Table 6.

Table 6
Income of Urban Local Bodies from Property Tax from 1996-97 to 2001-02 (Rs. in crore)

Year	MCs/NPs (A)	Municipal Corporations (B)				Total (B)	Grand Total (A+B)
		Ludhiana	Amritsar	Jalandhar	Patiala		
1996-97	12.46 (35.91)	12.83 (36.97)	3.18 (9.16)	3.83 (11.04)	2.40 (6.92)	22.24 (64.09)	34.70 (100.00)
1997-98	12.35 (35.37)	14.06 (40.26)	2.8 (8.03)	3.2 (9.16)	2.51 (7.18)	22.57 (64.63)	34.92 (100.00)
1998-99	14.81 (34.91)	16.94 (39.93)	3.41 (8.04)	4.12 (9.72)	3.14 (7.40)	27.61 (65.09)	42.42 (100.00)
1990-2000	19.61 (36.10)	22.13 (40.75)	3.99 (7.35)	5.04 (9.28)	3.54 (6.52)	34.7 (63.90)	54.31 (100.00)
2000-01	24.04 (36.02)	27.19 (40.75)	4.58 (6.86)	6.77 (10.15)	4.15 (6.22)	42.69 (63.98)	66.73 (100.00)
2001-02	18.83 (28.26)	32.41 (48.63)	4.51 (6.76)	7.01 (10.53)	3.88 (5.82)	47.81 (71.74)	66.64 (100.00)

Source: Local Government Department, Punjab

Note: Figures in parenthesis indicate percentage share in the total income from property tax in a particular year

The contribution of LMC to total PT collection is almost 49 per cent of the total PT income of the state. It is more than double that of three municipal corporations taken together and almost twice all other MCs/NPs. The innovative practices adopted by LMC are growth oriented and sustainable and can be replicated in other municipalities of Punjab to mobilize income from PT (Gupta and Teotia 2001).

PT in Punjab has the potential to generate additional revenue for the ULBs of more than 25 per cent per year in the next five years.

User charges for civic services: The FSFC noticed that the principle of 'user charges' is not being properly enforced by ULBs for providing civic services. As a result, most of these, which could be financed through 'user charges', are heavily subsidized or given free. In Punjab, municipalities do not recover even one-third of the cost of maintenance of water supply and sewerage. The FSFC noticed several deficiencies in the management of the water supply and sewerage system. They are:

- Large-scale evasion due to unsatisfactory billing and collection of water charges.
- Expenditure on maintenance is out of proportion and far in excess of the recovery by way of user charges from the consumers.
- There is no system of revision of rates for water supply and sewerage to provide for cost escalation including labour cost, wages, spare parts and hike in power tariffs.
- Too much wastage of water by public and street taps, theft through illegal connections and supply to unauthorized settlements are the other shortcomings.

The FSFC recommended that user charges should be extended to all municipal services, such as water supply, sewerage and parking lots and later to solid-waste management. The principle of full cost including operation and maintenance (O&M) costs, billing and collection costs and capital costs should be incorporated in user charges. Periodic revision of user charges, at least every three years, and a system of

charges based on the level of consumption and cross-subsidies to weaker sections should be introduced. The municipalities must ensure an efficient and desirable level of services to justify recovery of user charges. Instead of initiating reforms to recover full cost of water supply and sewerage, Amritsar Municipal Corporation passed a resolution to give free water and sewerage facilities. This is an example of fiscal adventurism that will destroy every rudiment of efficiency.

At present recovery of O&M charges of water supply and sewerage is poor in most of the municipalities. A report on the status of water and sanitation in Ludhiana city by the Financial Institutions Reforms and Expansion Project of United States Agency for International Development (USAID FIRE-D Project 2000) indicates that the average O&M recovery in LMC was only 17 per cent in 1999-2000. Though LMC has improved by adopting a number of innovative measures, there is still scope to improve recovery of O&M cost of water supply and sewerage.

Pricing and cost recovery through rationalization of user charges: Cost recovery for providing urban civic services in Punjab has been low and the provision of services is totally unrelated to its cost. Municipal services are considered 'social goods' and the concept of cost recovery has not been considered seriously. Presently the rich and the poor are charged the same rate for the services, which continues to be highly subsidized. On the basis of recommendations of the FSFC and major findings of a CRRID study of LMC by Gupta and Teotia (2001), the following measures can be adopted by ULBs for recovery of user charges of municipal services, especially water supply, sewerage and solid-waste management:

- Pricing for water needs to be rationalized on the basis of the unit-cost of production. There should be periodic revision of charges after every three years. Water rates should be linked to cost of production in general and with the revision of power tariff in particular, with an annual hike of ten per cent to offset the escalation in the cost of maintenance of staff and materials.
- Metering of water supply should be progressively introduced as the present system encourages wastage.
- There should be no free supply of water and the system of public stand-posts should be abolished. Beneficiaries should pay collectively for water supplied through stand-posts, even though the rate can be low or nominal. An innovative system of cross-subsidy from one income group to another needs to be worked out in the interest of equity.
- Sewerage charges need to be based on water consumed and should be equal to water tariffs.
- Commercial and industrial connections should be charged higher rates than residential connections and higher rates should be charged for higher consumption.
- Progressive management contracts of O&M of water supply and sewerage system, delivery of bills and running of tube wells will enhance efficiency.
- Cost-recovery for capital investment could be effected, at least in part, by charging upfront for new water and sewerage connections from users.
- Involvement of the local community in running tube wells, sanitation and park maintenance through Neighbourhood Tube-well Operators, Mohalla Sanitation Committees and Park Management Committees respectively, should be encouraged to ensure people's participation in municipal affairs and effect economy in expenditure on these services.

The CRRID study (Gupta and Teotia 2001) shows that some of these innovative urban management practices have been implemented by LMC, resulting in increase in revenue from water supply and sewerage and economy in expenditure on solid-waste management. Table 7 shows comparative growth of income of municipal corporations and MCs/NPs from water supply and sewerage charges.

Table 7
Income of Urban Local Bodies from Water Supply and Sewerage Charges from 1996-97 to 2001-02
(Rs. in crore)

Year	MCs/NPs (A)	Municipal Corporations (B)				Total (B)	Grand Total (A+B)
		Ludhiana	Amritsar	Jalandhar	Patiala		
1996-97	11.13 (37.04)	5.4 (17.97)	7.33 (24.39)	4.04 (13.45)	2.15 (7.15)	18.92 (62.96)	30.05 (100)
1997-98	10.19 (32.68)	6.69 (21.45)	7.52 (24.12)	4.38 (14.05)	2.4 (7.70)	20.99 (67.32)	31.18 (100)
1998-99	13.54 (35.59)	8.87 (23.32)	7.7 (20.24)	5.06 (13.31)	2.87 (7.54)	24.5 (64.41)	38.04 (100)
1990-2000	19.93 (45.63)	7.02 (16.07)	8.17 (18.70)	5.46 (12.50)	3.1 (7.10)	23.75 (54.37)	43.68 (100)
2000-01	21.38 (37.03)	17.4 (30.14)	8.31 (14.39)	6.18 (10.71)	4.46 (7.73)	36.35 (62.97)	57.73 (100)
2001-02	22.56 (37.84)	17.56 (29.45)	8.03 (13.47)	6.57 (11.02)	4.90 (8.22)	37.06 (62.16)	59.62 (100)

Source: Local Government Department, Punjab

Note: Figures in parenthesis indicate percentage share in the total income from water supply and sewerage charges in a particular year

The increase in the percentage share of income of LMC is encouraging, as its income from water supply and sewerage charges increased from Rs. 5.4 crore (17.97%) in 1996-97 to Rs. 17.56 crore (29.45%) in 2001-2002. According to Gupta and Teotia (2001), the water supply and sewerage reforms initiated by LMC are growth oriented and sustainable and can be replicated in other municipal corporations/councils.

Additional excise duty and share of auction money and excise duty: The recommendation of the FSFC to enhance additional excise duty (AED) payable to ULBs from seven per cent to ten per cent on country liquor has not been implemented. Recommendations to enhance the AED payable to ULBs on Indian Made Foreign Liquor (IMFL) from 16 per cent to 20 per cent has been considered by the government from time to time, when time of considering the annual excise policy, but no permanent decision has been taken so far. Table 8 shows amounts due and transferred to ULBs as share of auction money and excise duty.

Table 8
Amount Due and Transferred to Urban Local Bodies as Share of Auction Money of Country Liquor Vends and Excise Duty on IMFL (Rs in crore)

Year	Share of auction money & excise duty	Provision in the state budget	Amount released to ULBs	Difference between Cols. 2 & 4
(1)	(2)	(3)	(4)	(5)
1996-97	39.3	41.34	41.34	+ 1.98
1997-98	58.33	43.71	43.71	-14.62
1998-99	59.98	71.97	45.04	-14.94
1999-2000	63.44	57.52	38.34	-25.10
2000-01	61.96	*	63.44	+1.48
Total	283.07	214.54	231.87	-51.20

Source: Report of the Second Punjab Finance Commission (2002)

Note: *A token provision of Rs. 1000/- was made in the budget of 2000-01.

There is thus a shortfall of Rs. 51.20 crore. Transfer of the share of ULBs should be predictable, stable and transparent. The full share of ULBs in auction money and excise duty, as recommended by the FSFC, should be transferred to enable municipalities to prioritize future developmental activities.

Share of urban local bodies in state taxes: The FSFC recommended that 20 per cent of the net proceeds of the following five taxes and duties should be transferred to ULBs and PRIs, with defined principles of sharing *inter se* among them:

- Stamp Duty
- Electricity Duty
- Punjab Motor Vehicle Tax
- Entertainment Tax
- Entertainment (Cinematograph Shows) Tax.

The State Government decided to implement these recommendations with effect from the fourth quarter of 1996-97. The devolution of 20 per cent share of five state taxes to ULBs is shown in Table 9. It is evident that the transfers have been rather poor and continue to be partial without any justification. Recommendations of the Central Finance Commission are usually accepted in full and annual transfers from the Centre to the State are the same as recommended by the Commission. This is, however, not so in the case of recommendations of the State Finance Commission.

Table 9
Share of Urban Local Bodies in Five State Taxes (Rs. in crore)

Year	Receipts from 5 divisible state taxes #	Cost of collection	Net tax receipts (Col 2-Col 3)	20% share of net tax receipts (PRIs + ULBs)	Budget provision for ULBs	Amount transferred to ULBs	Shortfall (Col.6-Co.7) for ULBs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1996-97	450.54	5.15	445.39	22.27*	11.89**	-	11.89
1997-98	476.59	6.03	470.56	94.11	50.97	36.26	14.71
1998-99	542.21	12.81	529.40	105.88	45.57	10.82	34.75
1999-2000	701.26	11.36	689.90	137.98	40.00	13.18	26.82
2000-01	912.63	11.42	901.21	180.24	32.22	17.78	14.44
Total	3083.23	46.77	3036.46	540.48	180.65	78.04	102.61

Source: Report of the Second Punjab Finance Commission (2002)

Note: # 1. Stamp Duty, 2. Electricity Duty, 3. Motor Vehicle Tax, 4. Entertainment Tax, 5. Entertainment (Cinematograph Shows) Tax.

* 20 per cent share for fourth quarter of 1996-97 calculated by taking one-fourth of total net receipts for 1996-97.

** Revised budget outlay.

Transfers of shared revenue to municipalities are *ad hoc*, unpredictable, unstable and discretionary. Non-transfer of the full share to ULBs affects their fiscal domain and makes them even more dependent on the state government. Revenue sharing should be predictable and, in principle, the full amount should be transferred to ULBs to strengthen their fiscal base.

Taxation of central government properties: Taxation of Central Government properties is subject to the provisions in the Constitution. The Central Government has now settled the issue by allowing ULBs to charge only for the services provided by them. The EFC, after considering all aspects, has recommended that 'all government properties whether they belong to the Central or the State Governments, should be subject to the levy of user charges and should be regulated by a suitable legislation'.

In Punjab, only Amritsar and Ludhiana Municipal Corporations levy nominal service charges on Central Government properties. Recommendations of FSFC that steps to tap this source of revenue should be taken have not been considered seriously by the State Government as well as local bodies. Recommendations of the FSFC and the EFC should be taken seriously and ULBs should recover service charges on Central Government properties.

Enhancing local tax authority and internal revenue efforts: Devolution of buoyant fiscal tools to ULBs is necessary to enable them properly address the existing mismatch between functions and tax and non-tax sources. The FSFC suggested devolution of i) profession tax, ii) license fee on privately-bored tube wells, iii) surcharge on water pumped into the sewerage system, iv) full potential of the tax on advertisements and hoardings, along with periodical revision of non tax rates, and v) reduction of state control on fixing rates of local taxes. The state government has been indifferent to these valuable suggestions. It has not granted fiscal autonomy to ULBs to decide their own taxation rates.

The existing position of local tax authority and internal revenue efforts indicate a status quo situation, as nothing has been done to enhance local fiscal authority and internal resource mobilization. All powers remain vested in the state government and devolution of fiscal autonomy to ULBs remains unimplemented. The levy of local taxes, as recommended by the FSFC, will help to bring stability and strength to fiscal resources and help to build a strong and viable tax base.

Devolutions recommended by the Tenth Finance Commission and the Eleventh Finance Commission: Article 283 (3)(c) of CAA empowers the central finance commission to make recommendations regarding measures needed to augment the Consolidated Fund of a state, to supplement the resources of its municipalities on the basis of the recommendations of the state finance commission. The TFC for the first time made a provision of Rs. 30.60 crore to be given to ULBs of Punjab, on the basis of a ratio of the slum population derived from the urban population figures of the 1971 Census. The ULBs were required to prepare suitable schemes and provide matching contributions. It also mandated that no amount be used on salaries and wages. Table 10 contains grants recommended by the TFC, amounts received by ULBs and the shortfall.

Table 10
Grants Recommended by the Tenth Finance Commission
(Rs. in crore)

Year (1)	Grants recommended by the TFC (2)	Received by the ULBs (3)	Shortfall (2-3) (4)
1996-97	7.65	-	7.65
1997-98	7.65	-	7.65
1998-99	7.65	7.65	-
1999-00	7.65	9.56	-1.91
Total	30.60	17.21	13.39

Source: Report of the Second Punjab Finance Commission (2002)

The EFC has recommended a grant of Rs. 54.70 crore, i.e., Rs. 10.94 crore per annum to be given to ULBs for the period 2000-2005. Table 11 shows grants recommended by the EFC, amounts received by ULBs and the shortfall in 2000-01 and 2001-02.

Table 11
Grants Recommended by the Eleventh Finance Commission (Rs in crore)

Year 1	Grants recommended by the EFC 2	Received by the ULBs 3	Shortfall 4 (2-3)
2000-01	10.94	5.74	5.20
2001-02	10.94	-	10.94
Total	21.88	5.74	16.16

Source: Report of the Second Punjab Finance Commission (2002)

Tables 10 and 11 indicate that ULBs have not received the full amount as recommended by the Tenth and Eleventh Finance Commissions of India. The shortfall in grants is detrimental to the fiscal health of ULBs. Inadequate receipt of grants may result in slow progress of developmental activities and poverty alleviation programmes. The grants, as recommended by the TFC and the EFC, should be transferred to ULBs for successful implementation of urban development and poverty alleviation programmes.

Municipal expenditure: Municipal expenditure, comprising expenditure on general administration, tax collection, provision of services and debt servicing is shown in Table 12.

Table 12
Total Expenditure of Urban Local Bodies from 1996-97 to 2001-2002 (Rs. in crore)

Components of Expenditure	1996-97	1997-98	1998-99	1999- 2000	2000-01	Estimates 2001-02
1. General Administration	15.42	17.86	26.09	28.97	37.37	39.98
2. Tax Collection	35.9	39.14	50.85	59.54	49.75	52.24
3. Provision of Services	261.64	244.45	256.93	424.63	457.16	530.31
4. Debt Servicing						
a) Interest	2.78	2.8	1.55	1.58	1.67	2.70
b) Repayment of Principal	6.86	7.2	8.07	6.84	6.87	7.17
c) Total (a+b)	9.64	10.00	9.62	8.42	8.54	9.87
5. Miscellaneous	46.17	49.19	61.72	70.59	175.74	150.1
Total Expenditure (1+2+3+4c+5)	368.77	360.64	405.21	592.15	728.54	782.5

Source: 1) Report of the Second Punjab Finance Commission 2002)

2) Local Government Department, Punjab

Expenditure on establishment: According to the FSFC all municipalities incur unduly large expenditure on staff. Excessive cadreization with fixed strength, as determined by the government, does not leave any initiative for municipalities to reduce their expenditure on establishment. The excessive expenditure on staff is also due to unplanned expenditure on *ad hoc* and temporary workforce for sanitation, roads, water supply, etc. The FSFC considered this matter and recommended that measures should be taken to reduce excessive expenditure on the establishment and the limits on it upto a permissible percentage of the income must be adhered to. The State Government should exercise its authority to ensure that the cadre strength of various services is not inflated.

According to the SSFC, the cost of establishment was 42.03 per cent of the total own revenue and 39.57 per cent of the total expenditure of ULBs in 2000-01. It was higher than the limits fixed by Local Government Department, that not more than 35 per cent of the total expenditure should be spent on salaries. Privatization/contracting-out is being introduced in municipal functions, such as sanitation, streetlights, park maintenance, delivery of bills (through courier) and O&M of tube wells in a few municipalities. There is scope for privatization/contracting-out of municipal services in ULBs to reduce expenditure on establishment bringing it upto 35 per cent or even less.

The Local Government Department generally insists on the ULBs to present a balanced budget. Balancing of the budget, however, should not be at the cost of deficient municipal services. Table 13 shows the impressive budgetary surplus that has been increasing over the years.

Table 13
Budgetary Surplus in Urban Local Bodies from 1996-97 to 2001-02 (Rs. in crore)

Particulars	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	Total
Income	389.81	428.71	500.57	682.75	822.61	871.19	3695.64
Expenditure	368.77	360.64	405.21	592.15	728.54	782.50	3237.81
Revenue	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Surplus (+)/ Deficit (-)	21.04	68.07	95.36	90.60	94.07	88.69	457.83

Source: 1) *Report of the Second Punjab Finance Commission (2002)*
2) Local Government Department, Punjab

ULBS should not be forced to present balanced budgets. The revenue surplus would need to be leveraged for borrowings for much needed urban infrastructure and augmenting the existing civic services.

Data-base on Finances of Urban Local Bodies and Management Information System (MIS)

The FSFC and SSFC of Punjab, TFC and EFC have expressed serious concerns about the non-availability of data on the finances of local bodies. According to the EFC 'in the absence of any reliable financial/ budgetary data, no realistic assessment of the needs of the municipalities for basic civic and developmental functions can be made nor can any information be generated on the flow of funds to the local bodies for the implementation of various schemes for economic development and social justice'. The

SSFC has mentioned that a dependable and comprehensive database on the finances of local bodies is necessary but the position in this regard is not satisfactory. The FSFC and SSFC obtained the requisite data of income and expenditure of local bodies from them *ab initio*, and scrutinized and rectified the deficiencies.

The process of data collection, analysis, interpretation and updating should be expedited to strengthen policy planning for effective local self-government in Punjab. With the increased use of computerization, ULBs should be able to create a strong database on major aspects of municipal finances. The data will be useful for policy makers for predicting and managing the present and future development of growing cities. The recommendations of FSFC and SSFC regarding creation of a database should be implemented immediately. As recommended by the SSFC, the responsibility for the purpose may preferably be entrusted to the Director, Local Government and not to the Examiner Local Fund Accounts, as recommended by the EFC. A regulatory mechanism can help in continuous monitoring of data collection, evaluation and development of a management information system and its dissemination to various stake holders, like State and Central Governments for the finance commissions, planners, academics, research institutions/universities and consumers. An allocation of Rs. 10.93 lakh recommended by EFC for all ULBs of Punjab is not adequate and a specified percentage of budgets of ULBs should be earmarked for creation of database and MIS.

Property and Asset Management

The importance of property/ asset management in ULBs can hardly be over-emphasized. This is essential to improve the fiscal base and quantify the capital supporting the assets. ULBs should put together all scattered assets of land and buildings, which are possibly being eroded through encroachments or unauthorized takeovers. With computerization and a management information system in place, this technique will help to preserve, maintain and compute the orderly growth of assets, comprising lands, buildings and other municipal properties, which must be inventorized for recovery of rents and rates and the most economic use of assets. The LMC adopted this technique, with technical support from Infrastructure Professionals Enterprise (P) Ltd. It did a comprehensive land-inventory exercise and identified 865 additional properties including large tracts of land. The total monetary value of these assets is reported to be Rs. 350 crore. The potential revenue generation from these properties/assets of LMC is over a crore of rupees per annum. According to the CRRID study (Gupta and Teotia 2001), 'the mapping, survey of properties and inventory of old and newly identified assets, is a distinctive achievement of LMC towards tightening control on taxable properties and its own assets'. This can be replicated by other municipalities for strengthening their fiscal domain.

URBAN BASIC CIVIC SERVICES AND FINANCING URBAN INFRASTRUCTURE: A PLAN FOR URBAN DEVELOPMENT

Water supply, sewerage, surface drainage, solid-waste management, roads and street lighting are important urban basic civic services and core constituents of urban infrastructure. There is an acute pressure on these services in the wake of growing urbanization in Punjab. Most of the towns and cities of Punjab have serious deficiencies of civic services with regard to the coverage of population and level and quality of services. According to the FSFC of Punjab, water supply is a big casualty. Sewerage is inadequate, and even where sewerage exists, there is no proper arrangement for sewage disposal and its treatment. There are many pockets where even rudimentary

surface drainage does not exist. Solid waste collection, transportation and disposal leave much to be desired. The condition of roads and streets is highly unsatisfactory with about 40 per cent of the roads and streets needing extensive repairs. There are municipal areas without pucca roads and proper street lighting. Large segments of the population live in slums and lack access to basic civic services. The population served with water and sewerage in Punjab is depicted in Table 14:

Table 14
Coverage of Population with Water Supply and Sewerage

Type of towns	Number of towns	Coverage of population in percentage	
		Water supply	Sewerage
Municipal Corporations	4	70	57
Municipal Councils Class I	26	74	63
Municipal Councils Class II	42	77	41
Municipal Councils Class III	30	79	14
Nagar Panchayats	32	46	5
Total	134	71	52

Source: *Report of the Second Punjab Finance Commission (2002)* and Punjab Water Supply & Sewerage Board (2002)

Table 14 shows that even in corporation towns, 30 per cent people have no water facility and 43 per cent are without sewerage connections. The coverage of population with water supply and sewerage in Nagar Panchayats is only 46 per cent and five per cent respectively. The coverage of solid waste management is no better either. There is not even one operational solid waste treatment plant in the whole state. Sewage treatment facilities are also inadequate. As the population served with water supply is more than the sewerage, it results in environmental degradation, as excessive water is not disposed off properly and gets accumulated in low-lying areas. It creates air-water- and soil-pollution and adversely affects the health of the people.

The fact that infrastructure services do not pay for themselves and the government does not have the resources to continue to subsidize the beneficiaries has resulted in low availability of funds. With increasing requirements, there is deficiency in volume as well as quality of services. It is high time that a commercial approach is adopted for providing these services (NCAER 1996).

Physical Targets and Financial Requirements Projected by the First Punjab Finance Commission

The FSFC has laid down the physical targets for the years 1996-97 to 2000-01 as shown in Table 15.

Table 15
Physical Targets of Services Projected by the FSFC

Services	Targets for coverage by the year 2000-01
Water supply	90% population with per capita supply of 150-200 liters per day.
Sewerage & surface drainage	75% underground sewage and 25% surface drainage.
Roads & streets	75-100% coverage by all weather roads
Solid waste management	100% disposal
Street lighting	100% coverage with an average distance of 30 metres between the light poles.

Source: *Report of the First Punjab Finance Commission (1995)*

In addition, slum improvement and upgradation of fire services were included for assessing the requirements of funds. In order to achieve the above-mentioned targets, the FSFC made the following projections of cost (Table 16).

Table 16
Financial Requirements for Services Projected by the FSFC (Rs. in crore)

Services	Projected cost (1996-97 to 2000-01)
Upgradation of water supply and sewerage and escalation and maintenance of new assets.	1990.00
Upgradation of roads and streets, surface drainage, scavenging, sanitation, solid waste disposal, street lighting, slum improvement and upgradation of fire services and maintenance of new assets.	1797.71
Total	3787.71

Source: Report of the First Punjab Finance Commission (1995)

The FSFC took into account the income from the newly created infrastructure for water supply and sewerage, in addition to the projections of incomes of municipalities from various sources. It recommended that consumers benefiting from the services provided should pay for them and tariffs should be so fixed as to effect recovery of the total cost of operation and maintenance including capital costs. The FSFC, on the basis of the above principle, projected the income from user charges, but there has been a big gap in the projected and actual income from user charges from water supply and sewerage as shown in Table 17.

Table 17
Shortfall in the Projected and Actual Income from Water Supply and Sewerage Charges (1996-97 to 2000-01)
(Rs. in crore)

Year	User charges from water supply and sewerage projected by the FSFC	Actual income of ULBs from water supply and sewerage charges	Shortfall in the projected and actual Income (2-3)
(1)	(2)*	(3)**	(4)
1996-97	100.35	30.05	70.30
1997-98	182.27	31.18	151.09
1998-99	255.09	38.04	217.05
1999-2000	355.97	43.68	312.29
2000-01	459.01	57.73	401.28
Total	1352.69	200.68	1152.01

Source: * Report of the First Punjab Finance Commission (1995)

** Report of the Second Punjab Finance Commission (2002)

The shortfall in the income from water supply and sewerage charges has been due to a variety of reasons, such as non-implementation of the recommendations of the FSFC, especially about revision of tariffs, recovery of user charges by linking it with the hike in electricity charges and the recovery of expenditure on O&M, billing and collections and the capital cost of services. The recovery of user charges has not been fully extended to water supply, sewerage, parking lots and solid waste management and the principle of full cost recovery has not been adopted for reasons of 'political populism' or otherwise. Recently, Amritsar Municipal Corporation took a retrograde step by passing a resolution to provide free water supply, putting aside the principle of periodic revision of user charges recommended by the FSFC.

There has been a big gap in the expenditure projected by the FSFC and the actual expenditure on the provision of services as shown in Table 18. Projected expenditure on upgradation and maintenance of existing and new assets includes water supply, sewerage, storm water drainage, sanitation, roads, scavenging, streetlights, slum improvement, fire services including repayment of loans and existing expenditure of municipalities.

Table 18
Projected and Actual Expenditure on Provision of Services (1996-97 to 2000-01) (Rs. in crore)

Year	Expenditure on provision of services projected by the FSFC	Actual expenditure on provision of services	Shortfalls (2-3)
(1)	(2)*	(3)**	(4)
1996-97	419.99	261.64	158.35
1997-98	590.15	244.45	345.70
1998-99	736.72	256.93	479.79
1999-2000	926.64	424.63	502.01
2000-01	1114.21	457.16	657.05
Total	3787.71	1644.81	2142.90

Source: * *Report of the First Punjab Finance Commission (1995)*

** *Report of the Second Punjab Finance Commission (2002)*

The actual expenditure on provision of services has been much lower than projected by the FSFC. The Ninth Five Year Plan has ended with a massive backlog of funds needed for providing urban basic services in Punjab.

Physical Targets and Financial Requirements for Financing Urban Infrastructure Projected by the Second Punjab Finance Commission

According to the Report of the SSFC (2002) only '47 per cent of expenditure on operation and maintenance of water supply and sewerage schemes is being recovered by ULBs. In some ULBs the recovery is even less than 25 per cent of O&M expenditure'. This is so largely because rates of water supply and sewerage charges have not been revised by most ULBs since March 1993, except in Ludhiana (with effect from 5 April 1999), Jalandhar (with effect from 10 December 1999) and Patiala (with effect from 28 February 2000) Municipal Corporations. The rates continue to be highly subsidized and vary from municipality to municipality. The rates for yellow cardholders have not been revised for more than a decade.

The SSFC has worked out the present O&M cost for water supply at Rs. 2.73/- per KL, though the cost including depreciation and interest is rupees six per KL. The SSFC has recommended the following targets to recover 100 per cent O&M cost of water supply and sewerage (Table 19).

Table 19
Targets for Recovery of O&M Costs Projected by the SSFC (2002-03 to 2005-06)

Year	2002-03	2003-04	2004-05	2005-06
Targets for Recovery of O&M Costs (%)	60	80	90	100

Source: *Report of the Second Punjab Finance Commission (2002)*

The SSFC has recommended that efforts should be made to reduce O&M expenditure to the extent possible, through economy in energy consumption, proper maintenance of distribution pipes, privatization of preparation and distribution of bills, and to increase revenues by checking unauthorized connections. Much of the advantages of tariff reforms to cover O&M expenses in terms of saving water and preventing wastage will be lost unless water supply to the consumers is metered.

Table 20 shows estimated the targets for coverage of services and financial requirements as recommended by the SSFC for the years 2002-03 to 2005-06.

Table 20
Physical Targets and Financial Requirements for O&M and
Creation of New Assets Projected by SSFC (2002-03 to 2005-06) (Rs. in crore)

Particulars	Targets for coverage by the year 2005-06	Financial requirements for O&M and creation of new assets from 2002-03 to 2005-06	
		Without escalation	With escalation (@7 % per annum)
Water Supply	85%		
Sewerage	70%	642.00	728.29
Sewage Treatment Plants	Amritsar, Patiala, Gobindgarh, Rajpura, Batala, Bathinda and Malerkotla	166.61	189.62
Solid waste management	100%	138.08	162.25
Solid waste treatment plants	Four corporation towns and a few class I & II Towns	87.85	103.25
Storm water drainage	For corporation towns only	291.50	342.20
Roads & Streets	100%	586.44	689.04
Street lights	100%	270.76	318.16
Surface drainage	100%	187.81	220.71
Sanitation	100%	655.56	770.56
Other services	--	117.84	138.44
Grand Total		3144.45	3662.52

Source: Compiled from the *Report of the Second Punjab Finance Commission (2002)*

The suggested targets for provision of services seem to be on the lower side. The task is challenging, as the accumulated backlog of developmental works, especially water supply, sewerage and solid-waste management (including treatment) need massive investments. Management and handling of municipal solid waste to comply with Municipal Solid Wastes (Management and Handling) Rules, 2000, also require huge investments.

The success of the New Economic Policy and the objectives of the state government to increase economic growth and quality of life in urban areas, is critically contingent on a strong urban infrastructure and service support. Adequate provision for these services is essential to ensure creation of an environment-friendly, sustainable urban infrastructure for the citizens. In this perspective, the objectives should be to achieve the targets in the next five years in respect of core services in urban areas of Punjab as shown in Table 21. The estimates of likely expenditure on these services for the period 2002-03 to 2006-07, taking into account the escalation in cost, have been prepared in consultation with the Local Government Department and the Punjab Water Supply & Sewerage Board.

Table 21
Physical Targets and Financial Requirements for Water Supply, Sewerage, Solid Waste Management and other Infrastructure Services from 2002-03 to 2006-07 (Rs. in crore)

Particulars	Target of coverage (%) by the year 2006-07	Financial requirements					Total (2002-03 to 2006-07)
		2002-03	2003-04	2004-05	2005-06	2006-07	
Water supply	100	106.0	111.0	121.0	122.0	122.0	582.0
Sewerage	100	210.0	270.0	310.0	380.0	440.0	1610.0
Drainage	25	63.0	81.0	93.0	114.0	132.0	483.0
Sewage treatment Plants	100	168.0	168.0	168.0	168.0	171.0	843.0
Solid waste Management							
(a) Extension and augmentation of collection and transportation	100	20.0	20.0	20.0	20.0	25.0	105.0
(b) Treatment and disposal	100	25.0	25.0	25.0	25.0	25.0	125.0
O&M of water supply & sewerage system		167.5	171.0	174.0	177.5	187.0	877.0
Roads & Streets	100	140.0	140.0	140.0	140.0	140.0	700.0
Street lights	100	60.0	60.0	60.0	60.0	60.0	300.0
Fire services	100	35.0	35.0	35.0	35.0	35.0	175.0
Parks, gardens, urban forestry, parking and bus stands etc.	-	40.0	40.0	40.0	40.0	40.0	200.0
Grand Total	-	1034.5	1121.0	1186.0	1281.5	1377.0	6000.0

Source: 1) Punjab Water Supply and Sewerage Board (2002)
2) Local Government Department, Punjab
3) CRRID Projections

The estimated investment to cover the total population with water supply, sewerage, solid waste management, roads, street lights is Rs. 1,034.5 crore in the first year, i.e., 2002-03. The total funds needed for investment from 2002-03 to 2006-07 have been estimated at Rs. 6,000.0 crore.

Projection of Income and Expenditure of Urban Local Bodies

The projected income, expenditure and resource gap of ULBs for the next five years, i.e., 2002-03 to 2006-07, is presented in Tables 22, 23 and 24 respectively.

Table 22
Projected Income of Urban Local Bodies from 2002-03 to 2006-07

Components of the Income	Estimates*	Projections (Rs. in crore)				
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
1. Tax revenues						
a) Octroi	531.72**	584.89	643.38	707.72	778.49	856.34
b) Property tax	66.64	83.3	104.13	130.16	162.7	203.37
c) Share from auction money & excise duty on liquor	60.99	65.26	69.83	74.72	79.95	85.54
d) Others	3.5	3.85	4.24	4.66	5.12	5.64
e) Total (a+b+c+d)	662.85	737.3	821.58	917.26	1026.26	1150.89
2. Non-tax revenues						
a) Water supply & sewerage charged	59.62	74.53	93.16	116.45	145.56	181.95
b) Others including capital receipts	112.12	123.33	135.67	149.23	164.15	180.57
c) Total (a+b)	171.74	197.86	228.83	265.68	309.71	362.52
3. Revenues from own sources						
Total (1e+2c)	834.59	935.16	1050.41	1182.94	1335.97	1513.41
4. Share from taxes as per recommendations of the SSFC	--	72.36	77.80	83.77	90.34	100.40
5. Grants						
a) As per recommendations of 11th Finance Commission	10.95	10.95	10.95	10.95	10.95	10.95
b) For Centrally sponsored and State Plan schemes	23.25	23.25	23.25	23.25	23.25	23.25
c) Others	2.4	2.64	2.9	3.19	3.51	3.86
d) Total (a+b+c)	36.6	36.84	37.10	37.39	37.71	38.06
6. Total Revenue (3+4+5d)	871.19	1044.36	1165.31	1304.10	1464.02	1651.87

Source: *Local Government Department, Punjab

Note: 1) **Revenue from octroi for the year 2001-02, includes grants of Rs. 140.51 crore against the loss, on account of abolition of octroi (1 December 2001 to 31 March 2002)

2) Growth rates for projections (in percentage):

a) Octroi	10
b) Property tax	25
c) Share from auction money and excise duty on liquor	7
d) Water supply and sewerage charges	25
e) Others including capital receipts	10

Table 23
Projected Expenditure of Urban Local Bodies from 2002-03 to 2006-07
(Rs. in crore)

Components of expenditure	Estimates*	Projections				
	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
1. General administration	39.98	40.64	43.48	46.53	49.78	53.27
2. Tax collection	52.24	55.00	55.00	55.00	55.00	55.00
3. Provision of services	530.31	609.86	701.33	806.54	927.52	1066.64
4. Debt servicing						
a) Interest	2.70	4.70	4.70	4.70	4.70	4.70
b) Repayment of principal	7.17	8.50	8.50	8.50	8.50	8.50
c) Liabilities of old loan	-	-	-	7.00	17.50	31.50
d) Total (a+b+c)	9.87	13.20	13.20	20.20	30.70	44.70
5. Miscellaneous	150.10	165.11	181.62	199.78	219.76	241.74
Total Expenditure (1+2+3+4d+5)	782.50	883.81	994.63	1128.05	1282.76	1461.35

Source: *Local Government Department, Punjab.

Table 24
Projection of Resource Gap from 2002-03 to 2006-07 (Rs. in crore)

Particular	Years					Total
	2002-03	2003-04	2004-05	2005-06	2006-07	
Total income of ULBs	1044.36	1165.31	1304.10	1464.02	1651.87	6629.66
Total exp. of ULBs	883.81	994.63	1128.05	1282.76	1461.35	5750.60
Surplus	160.55	170.68	176.05	181.26	190.52	879.06

Table 24 projects a surplus for the next five years, but this alone cannot meet the requirement of funds by ULBs for financing urban infrastructure. Therefore, gigantic efforts are needed to raise funds to finance basic urban infrastructure for the entire urban population to make cities livable.

Strategic Planning for Financing Basic Civic Services and Urban infrastructure

Broad contours of reforms in non-tax sources, as discussed below, will enable additional generation of resources as also direct and indirect cost recovery. The Local Government Department should improve buoyancy of existing taxes and use tools of resource mobilization to finance urban infrastructure. The following steps can improve pricing and cost-recovery of water supply and sewerage and improve fiscal health of ULBs:

- Metering of water supply, as it will be fair and equitable to both providers and consumers.
- Rationalization/revision of water supply and sewerage charges linked with electricity tariff.
- Detection of arrears and charging interest on delayed payments.
- User charges should cover all civic services that qualify for levy of user charges.
- Involvement of citizens in fixation of tariffs, checking misuse of services including detection of thefts.

These objectives can best be achieved through strong political will, peoples' participation and better use of information technology, i.e., computerization of billing and collection, creation of database and display of all important information/events on websites. According to the India Infrastructure Report (NCAER 1996) 'cost minimization needs appropriate technology, proper attention on maintenance, curbing misuse of services and efficient service provisions'. Technological innovations in water supply, sewerage and solid waste management can promote low cost options and commercial viability of the projects. Recycling of water and re-charging/conservation of rainwater should be promoted.

There is tremendous scope for private sector participation (PSP) in infrastructure development and delivery of services. PSP can help in developing commercially viable projects and ensure efficient provision/delivery of services, customer satisfaction, pricing and cost recovery. LMC has succeeded successful in mobilizing resources and upgrading the level and quality of environmental infrastructure through public-private partnership. The practices adopted by LMC need to be implemented by other municipalities as well.

Additional Resource Mobilization for Financing Urban Infrastructure

The financial targets for providing the projected basic civic services could be achieved by revising the existing tariffs and recovery of 100 per cent cost of O&M of water supply and sewerage in the next five years. This will create confidence among national and international investors. Revision of water supply and sewerage tariff will generate additional revenue of Rs. 20 crore per annum. Punjab could take the clue from ULBs of other states with higher rates of water supply and adjust its own rate structure on the pattern of such cities as Jaipur, Chandigarh, Bangalore and Chennai, etc., as shown in the Table 25.

Table 25
Water Tariffs in Selected Cities of India* (1998-99)

Cities	Metered rates (Non-slab) (In Rs./KL/Month)			Unmetered flat rates (In Rs./Year)			Metered slab rates (In Rs./KL/ Month)		
	Domestic	Non - domestic	Industrial	Domestic	Non - domestic	Industrial	Domestic	Non-domestic	Industrial
Vishakhapatnam	5.00	-	12.00	480.00	-	-	-	-	-
Madurai	5.00	-	20.00	240.00	-	3360.00	-	-	-
Hyderabad	3.50	15.80	-	480.00	-	-	55.00-up to15KL 3.75-15-25 KL 6.00-25-50 0KL	-	-
Ahemedabad	3.00	-	-	-	-	25-30% of ARV	-	-	-
Pune	2.50	12.00	-	-	-	-	-	-	-
Bangalore	-	-	60.00	-	-	-	65.00 (minimum) 3.50 upto 25 KL 7.00-25-50 KL 19.00-50-75 KL 26.00-75-100 KL	33.00 upto 10 KL 39.00-10-20 KL 44.00-20-40 KL 51.00-40-60 KL 57.00-60-100 KL 60.00 above 100 KL	-
Chennai	-	-	-	600.00	-	4800.00	2.50 upto 10KL 10.00-10-15 KL 15.00-15-25 KL 25.00-above 25 KL	-	25.00 upto 500 KL 40.00- above 500 KL
Bhopal	-	-	8.00	720.00	-	-	-	-	-
Jaipur	-	-	-	-	-	-	1.56 upto 15 KL 3.00-15-40 KL 4.00 above 40 KL	4.68- upto 15 KL 8.25-15-40 KL 11.00- above 40 KL	11.00- upto 15 KL 13.75-15-40 KL 16.50 above 40 KL
Chandigarh**	-	9.00	11.00	-	-	-	1.75 upto 15 KL 3.50- 15 -30 KL 5.00-30-60 KL 6.00 above 60 KL	-	-

Source: 1) * National Institute of Urban Affairs (2001), *Urban Water Supply and Sanitation: Status and Investment Implications*, NIUA, New Delhi
2) **Municipal Corporation of Chandigarh (August 2002)

The slab system is equitable as it takes care of the poorer sections of the society who consume lesser quantities of water. Property tax reforms suggested in the previous section will yield an additional income of Rs. 30 crore per annum. Fees and rents constituting non-tax revenue are low and even the nominal cost of rendering these services are not recovered. Rationalization of fees and rents is estimated to yield an additional income of Rs. 10 crore per annum. The breakup of additional resource mobilization is given in Table 26.

Table 26
Additional Resource Mobilization by Urban Local Bodies

Revision of tariff on user charges	Rs. 20 crore per annum
Increased income from property tax	Rs. 30 crore per annum
Enhanced recovery from fees and rents	Rs. 10 crore per annum
Total additional income	Rs. 60 crore per annum

This will strengthen the fiscal capability of ULBs and will help to raise finances from the capital market. The proposed financing of implementing projected urban infrastructure and services is given in Table 27.

Table 27
Proposed Financing of Projected Urban Infrastructure and Services

Contribution by urban local bodies	Rs.150 crore per annum
Transfer from the Punjab Infrastructure Development Board (On the pattern of transfer to Public Works Department (PWD)/Bridges and Roads (B&R) and Irrigation Department)	Rs.75 crore per annum
Earmarked contribution by the State Government out of devolution of funds	Rs.75 crore per annum
Total	Rs.300 crore per annum

Financing urban infrastructure and basic services requires Rs. 6,000 crore, i.e., an average investment of Rs. 1,200 crore per annum. With an additional resources of Rs 300 crore on account of improved fiscal performance by the municipalities, consequent upon reimposition of octroi, upward revision of tariffs and user charges, PT reforms, better tax administration and economy in expenditure supported by political will, it is possible to raise Rs. 900 crore per annum from national and international capital markets. Rating agencies will give a good rating to raise tax-free municipal bonds. Institutions such as LIC, General Insurance Corporation (GIC), HUDCO, Industrial Credit and Investment Corporation of India (ICICI) and Infrastructure Leasing and Financial Services (IL&FS) too will support commercially viable projects. A part of the assured income of ULBs could be dedicated to the escrow account to assure timely payment of principal and interest, to enhance the confidence of the investors in municipal debt instruments.

A project report based on the above parameters, including cash flow statements, to meet the requirements of rating agencies and lenders should be prepared by a group of professionals. The project report should be acceptable to lenders for subscribing to the tax-free bonds/loans in suitable tranches, for raising funds through private placement from the capital market. The 'aims and objects' of raising the funds would be attractive, being developmental, covering the entire community including the poor and the deprived.

Municipal Bonds for Financing Urban Infrastructure

'Municipal Bonds', as an instrument to finance urban infrastructure, is relatively a new concept in India. This mode of accessing the capital market on the strength of commercially viable projects took its birth in the mid-nineties. The New Economic Policy (NEP) along with liberalization and structural adjustments has led to search for an alternative system of financing infrastructure development.

There is concern today for promoting efficient use of resources, which traditionally comprised subsidies, grants and loans. This system of financing could not make the municipal administrators proactive in rationalizing tariffs for 'user charges', to put in place an effective system of cost recovery. Availability of funds for the development of urban infrastructure and services from traditional sources is presently unthinkable. All this has culminated in a change of mindset for accessing the capital market by issuing municipal bonds. Till date, the cities of Ahmedabad (twice), Nagpur, Nasik, Indore, Ludhiana, Bangalore, Madurai and Hyderabad have accessed the capital market for raising funds through municipal bonds as shown in Table 28.

Table 28
Access of Municipal Bond Market in India by Municipal Corporations

Name of municipalities	Year of issue	Size of issue (Rs in crore)	Government guarantee	Credit rating
Ahmedabad Municipal Corporation	1998	100.0	NO	AA (SO)
Bangalore Mahapalika	1997	100.0	NO	A (SO)
Ludhiana Municipal Corporation	1999	17.8	NO	AA (SO)
Nasik Municipal Corporation	1999	100.0	NO	AA (SO)
Nagpur Municipal Corporation	2000	50.0	NO	AA- (SO)
Madurai Municipal Corporation	2001	30.0	NO	A+(SO)
Indore Municipal Corporation	2001	10.0	Yes	N.A
Ahmedabad Municipal Corporation	2002	100.0	NO	AA (SO)
Hyderabad Municipal Corporation	2002	82.5	NO	AA+(SO) and LAA+(SO)

Source: Gangadhar Jha, (2002): *Development of Municipal Bond Market in India*, NIUA, New Delhi

The Government of India has permitted raising of tax free bonds by city governments, for structuring commercially viable/bankable projects and for developing a long-term debt market. The Union Finance Ministry permitted raising tax-free municipal bonds upto Rs. 200 crore in 2001-02. This amount has been increased to Rs. 500 crore in 2002-03. HUDCO has created a fund for project development and restructuring, for participation in the emerging bond market. The success of raising funds from the capital market is contingent on the internal financial strength, which will enable city governments to obtain investment-grade credit rating, for accessing the capital market and service the debts thus raised.

Financing of urban infrastructure through credit rating calls for certain reforms. The accounting system has to be such that it throws light on the basic parameters of financial strength and performance of city governments. Some states, notably Tamil Nadu, have

switched over to a new accrual-based double-entry accounting system for municipal governments. Other measures include tax reforms, effective tax administration, rationalization of user charges, effective billing and collection, asset management and upgrading professional skills of municipal staff through extensive training.

There is need to raise low cost resources to bridge the backlog of infrastructure services. To achieve it Tamil Nadu Urban Development Fund (TNUDF) raised Rs. 110.05 crore from the capital market on the basis of LLA + (SO) rating. TNUDF has so far approved a number of projects costing Rs. 669.60 crore, comprising such core amenities as improvement of sewerage, storm-water drainage, sanitation, solid waste management services and augmentation of water supply. Financial institutions at the national level, such as ICICI, IDFC, IL&FS and HUDCO are important partners of the Fund. TNUDF was able to obtain a loan also from the International Bank for Reconstruction and Development (IBRD), linked to performance criteria. Based on this support, it floated the first non-guarantee unsecured bonds in the capital market, issued by a financial intermediary with urban municipal cash flow as its base. Financial institutions, commercial banks and insurance companies are the major subscribers to the bond issue. This was part of TNUDF's efforts to position itself as a pooled financial agency for the smaller ULBs for providing funds for urban infrastructure on a long-term basis. Lenders to the municipalities are provided escrow cover to ensure repayments (TNUDF 2001).

Punjab Infrastructure Development Board (PIDB), responsible for overall development planning, policy formulation, regulation and single window approvals for infrastructure development in the state, was established under the Punjab Infrastructure Development Act, 1998. It provides for the establishment of Punjab Infrastructure Initiative Fund to accelerate the development of infrastructure in Punjab. A cess of one per cent on the sale of petrol/diesel and agricultural produce, except fruits, vegetables and pulses, is credited to Punjab Urban Development Fund (PUDF). In 2000-01, PIDB raised Rs. 300 crore through private placement of bonds rated by Investment Information and Credit Rating Agency (ICRA) as 'LA (SO)', indicating adequate safety and timely payment of interest and principal. For this, the Punjab Government gave an irrevocable guarantee for repayment of principal and interest thereon till maturity. The repayment has been ensured through escrow mechanism. The existing financing pattern of PIDB indicates that funds raised by it through infrastructure-cess and bonds have not been used for urban infrastructure, which comprise water supply, sewerage disposal and treatment, municipal roads, street lighting, solid waste management, parks and urban mass transit system. This requires immediate intervention.

The other innovative entities are West Bengal Municipal Development Project, Karnataka Municipal Development and Urban Infrastructure Projects, Mumbai Urban Infrastructure Development Project, Rajasthan Urban Infrastructure Development Project, Preparatory Technical Assistance for Calcutta Municipal Environmental Improvement Programme and National Urban Environmental Infrastructure Fund. All these projects/ funds have essentially a common denominator, such as assistance from the World Bank, Asian Development Bank (ADB) or other international funding agencies and the local capital market, for raising funds for the improvement of the quality of urban life including the poor.

The Finance Minister, Government of India, in his budget speech (2002-03) observed, 'we are aware of the sad plight of most of our towns and cities. This needs to be

changed if they have to act as engines of growth, and if they are to provide a healthy environment for our citizens. Hence, we can no longer afford to delay reforms in this sector.'

The Local Government Department should look for assistance from the World Bank, ADB and other international agencies, by structuring viable and bankable projects through escrowing a portion of the income of ULBs for credit enhancement and giving confidence to investors. There is need to create a pooled financing mechanism in Punjab to enable ULBs, especially in the small and medium towns, as in Tamil Nadu, to raise funds for financing urban infrastructure.

The India Infrastructure Report (NCAER 1996), in its chapter on Urban Infrastructure, has recommended that 'a state level Regulatory Body be set up to monitor quality of services provided and price charged'. It is incumbent on the state to create a strong regulatory mechanism, to promote PSP in project development, its financing, pricing and cost recovery (user charges) and quality control. Regulatory measures are also important for long-term contracts, leases and concessions. The regulatory mechanism should be independent, so that it is not influenced by short-term populist measures of political parties for electoral interests.

The regulatory mechanism has assured significance with the implementation of the New Economic Policy, characterized by liberalization and privatization. The Local Self Government Department should draw up a legislative proposal, so that the proposed regulatory body can determine and suggest suitable/viable options of public-private sector participation in infrastructure financing, delivery of services and pricing and cost recovery. Regulated PSP promotes competitiveness and improves quality of services. The charges and rates of services fixed by the regulatory mechanism, after hearing the consumers and other stakeholders, will create confidence in their authenticity and the utilization of the revenue earmarked for development projects for the benefit of the persons paying these charges. The regulatory mechanism will be able to identify various types of risks in PSP projects and the inefficiencies of the organization providing and delivering the services. The result of such an exercise would be that the consumers would not have to pay for inefficiencies at different levels.

PRIVATE SECTOR PARTICIPATION AND PEOPLE'S INVOLVEMENT IN MUNICIPAL AFFAIRS AND URBAN DEVELOPMENT

Urbanization in Punjab is expected to accelerate in the current decade on account of economic reforms, industrialization, commercial growth and consequent migration to cities for employment. It will create a demand for efficient urban infrastructure. ULBs and other public agencies are unable to provide an adequate level of infrastructure conforming to established standards and norms, due to lack of financial resources, poor tax base and age-old technologies. There is pressure on city governments for augmentation of infrastructure services.

The fiscal stress and inability to recover the full cost of services by city governments do not permit them to even maintain the existing level of services, let alone augment them. Therefore, PSP and peoples' involvement in municipal affairs acquire importance for enhancing the fiscal capacity of ULBs to provide adequate infrastructure services and reduce expenditure on service delivery.

Private Sector Participation

PSP is a potential option to cope with the challenges of growing needs of financing urban infrastructure. The volume of investment required for removing the backlog and also for augmentation of services is massive. This gap can be met through PSP, which may take the form of total privatization, or contracting-out, or public-private partnership. PSP will bring much needed resources, new technology, enhance efficiency and ease budgetary constraints. The private sector frequently acts as a contractor to build infrastructure facilities and sometimes operates and manages them. Now, a growing pool of domestic and international private finance is available for investing in commercially viable urban infrastructure projects, lack of which has been a serious constraint for accessing the capital market. It is expected that PSP can establish sustainable partnership between the public and private sectors. The community will benefit through PSP, as it brings in management efficiency, quick and effective decision-making and capacity-building for more efficient delivery of services leading to greater consumer satisfaction.

PSP can help in off-loading the financial, functional, administrative and managerial burdens of ULBs. It can also help in augmenting and maintaining rapidly expanding urban infrastructure services. A study of LMC by Gupta and Teotia (2001) shows that the involvement of PSP in municipal affairs, especially in the collection, preparation and distribution of bills, and operation and maintenance of tube wells, has improved efficiency, along with reduction of administrative and overhead expenses and improved delivery of services.

Hyderabad Municipal Corporation has gone for PSP for its solid waste management services. About 60 per cent of the total work has been contracted out and work has been divided into 'day units' and 'night units'. This has improved sanitation, resulted in an enhanced role of the community and increased participation of citizens (IHS-India 2002).

Two promising PSP projects in water supply and sanitation are the Tirupur Water Supply and Sewerage Project and a recent initiative to provide water supply to three medium-sized towns in Karnataka by a joint venture company. The Tirupur Project is the first water supply and sewerage project to be structured in a commercial format. It is also the first to use 'index-based user charges' and direct cost recovery for urban environmental services. The 'water purchase-guarantee' provided by the beneficiary group and equity participation by the Build-Operate-Transfer (BOT) operator are some of the good aspects of this partnership model (Mathur 2001).

Alandur Municipality has contracted out a sewerage project to a private sector operator, to augment its network, construct pumping houses and sewage treatment plants. Out of the investment of Rs. 45 crore, Rs. 13.2 crore will be provided by TNUDF as a loan. Loans from other financial institutions and internal sources of Alandur Municipality from connection charges and sewerage charges are financing the project. Alandur Project is unique in the sense that it is the first attempt to involve the community. The progress of the project is reviewed on a monthly basis through public meetings. Its success is assured as the community is responsive and the Government of Tamil Nadu is supportive of Alandur Municipality.

Rajkot Municipal Corporation has contracted out maintenance of streetlights, solid waste removal and transportation, cleaning of public toilets, maintenance of gardens and fire

stations. Pali (Rajsthan) Municipal Council has entrusted the maintenance of streetlights to the private sector. The City and Industrial Development Corporation (CIDCO), a public sector institution in New Mumbai, has had a successful experience with privatization, which included maintenance of sewerage pumps and water pumps, meter reading and billing, maintenance of parks and gardens and collection of service charges. The Karnataka Water Supply and Sewerage Board (KWSSB) has handed over O&M and augmentation of water supply and sewerage system of four cities, namely, Belgam, Hubli, Dharwad and Mysore to a UK-based private company. It will first reduce unaccounted water-use and improve operational efficiency and then arrange finance for new investments. The KWSSB has introduced an innovative pricing structure in which water charges are linked with O&M expenditure and debt servicing (IHS-India 2002).

Private companies have assured the Municipal Corporation of Delhi (MCD) a minimum toll tax collection of Rs. 1 billion per annum as compared to Rs. 0.57 billion collected by MCD, out of which about 30-40 per cent is establishment cost, resulting in a net income of less than Rs. 0.4 billion. A South African company has been entrusted the task of toll tax collection for NOIDA Toll Bridge, which is an exemplary infrastructure project completed with the help of PSP (*Urban Finance* 2002). Surat Municipal Corporation (SMC) has introduced PSP in delivery of municipal services especially solid waste collection, maintenance of street-lights, construction of roads, tree planting and operation of water treatment plants. This, along with other innovative urban management practices, has considerably improved the environmental conditions of Surat. Several states, such as West Bengal, Maharashtra, Rajasthan, Andhra Pradesh, Haryana and Madhya Pradesh too have introduced privatization in the delivery and expansion of municipal services and infrastructure development.

There is need to expand the scope of PSP to attract investment in large- and medium-size infrastructure projects. Municipalities in small and medium towns can raise loans/debt from private sector financial institutions, through the 'pooled financing mechanism', for financing their urban infrastructure projects.

The Government of India in its Budget 2002-03, has initiated the following reforms and sources of funds to promote PSP/ Public-Private Partnership (PPP) in urban/municipal infrastructure development:

- The Urban Reform Incentive Fund (URIF), with an allocation of Rs. 500 crore to provide reform-linked assistance to states. Apart from assisting other areas it seeks to provide incentives to reforms through initiation of PPP in the provision of civic services.
- A City Challenge Fund (CCF) has been established to support cities by funding transitional costs of moving towards sustainable and credit-worthy institutional systems of municipal management and service delivery. It will assist in partial financing of the cost of developing an economic reform programme and financially viable projects, to be undertaken by ULBs with the help of the private sector.
- The Pooled Finance Development Scheme will help credit- augmentation to assist small ULBs to access market borrowing on a credit-worthy basis.
- The Union Finance Minister has announced that 'Public-Private Partnerships will be encouraged for the provision of infrastructure facilities, the modalities for which are being worked out by a Task Force'.

Such multilateral development banks as the World Bank, (WB) and the ADB have developed guarantee schemes, to attract international private capital for financing urban infrastructure projects in developing countries. The WB facilitates access by lengthening the maturity of related borrowing. This provides ample opportunity for ULBs to go for infrastructure-related projects with the help of international funding agencies, without the direct backing of the state government. The WB also issues guarantees for project financing, under the Extended Co-Financing Facility, to cover sovereign risks associated with infrastructure projects (IHS-India 2002). This will improve access to international capital markets and the role of PSP in financing urban infrastructure projects in Punjab.

Punjab can benefit from these reform-linked assistance initiatives by encouraging PSP/PPP in infrastructure development and financing basic civic services. The FSFC and the SSFC of Punjab have emphasized privatization of municipal services, tax collection and infrastructure development activities. The recommendations of the First and Second State Finance Commissions should be considered seriously and implemented to pave the way for the involvement of the private sector.

People's Participation

At present there is no involvement of people, citizen's organizations and non-governmental organizations (NGOs) in management of municipal affairs. Active peoples' participation in infrastructure management, urban development and service delivery can help ULBs enhance coverage and convergence of services. Evaluation of urban poverty alleviation programmes in Punjab indicates that their poor implementation is due to lack of peoples' participation and of neighborhood groups.

Involvement of local communities has become imperative for the success of urban development and poverty alleviation programmes, management of municipal affairs and sustainability of cities. Innovative and best practices in urban development and poverty alleviation schemes are unlikely to succeed without making the beneficiaries themselves partners in the implementation. The following area-wise issues for promoting peoples' participation in providing some of the services and implementing different programmes need to be addressed seriously.

Water supply: There is little or no partnership of local people in the delivery of urban water service. Consumers can be actively involved at various levels of the water supply system. For instance, LMC involved local people in running tube wells through Neighborhood Tube Well Operators, resulting in economy in municipal expenditure. This practice can be replicated by other ULBs (Gupta and Teotia 2001). The other areas of peoples' participation can be detection of leakages, thefts, water conservation and quality monitoring. Citizens can be involved in promoting the concept of 'pricing and cost recovery' and principles of 'user pays' and 'polluter pays'. People should be mobilized to recycle waste water and use harvested rain water for lawn irrigation and other domestic purposes. According to the Ninth Five Year Plan, financing of drinking water supply programmes is a crucial issue in urban areas because of the massive investment required. In this context peoples' involvement can help to reduce 'wasteful use' of water in day to day domestic activities and expenditure in service delivery, and sensitize consumers to pay the full cost of water.

Sewerage: This is one of the least discussed but one of the most important and expensive services. It needs active participation of users. Inadequate coverage and poor maintenance of sewerage systems affect urban environment and health of the local population. The burden on the sewerage system is increasing due to growth in urban population and misuse of water facility. Damage of sewerage pipes, throwing of kitchen garbage and other waste material in sewers is a common phenomenon, which needs to be tackled at the source. People are not aware of the ill impact of an overflowing sewerage system. They should be involved in ensuring the smooth flow of sewage. This is possible only if people do not throw non-degradable waste material in sewers and do not damage sewer lines. The principle of 'polluter pays' should be applied and violators should be brought to book. Dissemination of information to and education of sewer users can help ULBs to maintain the system efficiently. This will result in economy in expenditure on O&M of the sewerage system.

Baroda Citizens Council (BCC), a non-governmental organization, works intensively in 30 communities reaching 12,000 families to provide sanitation, shelter improvement, vocational training, health and education services. BCC became a partner in a slum networking project for environmental sanitation in Ramdev Nagar in 1994. People contributed 50 per cent of the cost of construction of community-level infrastructures, such as shallow-bore sewer, water line and house connections, streetlighting, roads, community garbage collection and landscaping, and the entire cost of constructing household toilets and facilities, such as bathing places (NIUA 2001). This shows that the community, if made a partner in development, can contribute in many ways.

Solid waste management: Peoples' participation in solid waste management (SWM) in urban areas is almost non-existent. It is considered the sole responsibility of ULBs and peoples' attitude towards it is negative. At present they are not aware about environmental, social, economic and health implications of poor waste management. ULBs suffer from financial, technical and human resource constraints in efficiently managing solid waste. Inadequate waste management in urban areas is due to lack of peoples' involvement in solid waste management. The CRRID study (Gupta and Teotia 2001) indicates that LMC involved people in upgrading sanitation services and successfully implemented the 'Mohalla Sanitation Scheme' for efficient management of waste. The scheme has effected economy in municipal expenditure on sanitation and improved environmental conditions in the city. This practice should be replicated in other cities to ensure peoples' participation in SWM and environmental improvement of neighbourhoods in urban areas.

NGOs like EXNORA in Chennai, Sristhi in Delhi, Muskan Jyoti Samiti (MJS) in Lucknow, Urban Community Development (UCD) project in Pune, Surat Citizens Council (SCC) in Surat and Baroda Citizens Council (BCC) in Baroda have demonstrated that peoples' participation can dramatically improve sanitation in the neighbourhoods and promote compliance to user charges. The dramatic transformation of Surat into a clean and green city has been possible due to the combined efforts of the Surat Municipal Corporation and the local people, whose aspirations for a clean city have been a compelling factor in this change. The SCC, a citizen's forum, is reported to be working on a scheme to recruit responsible citizens to function as watchdogs to ensure that the reforms continue (NIUA 2001). This has reduced expenditure of ULBs on SWM. Involvement of citizens has to be ensured in segregation of waste at source, its collection and transportation, creating awareness about the impact of littering, pricing and cost recovery, better handling of waste at home and outside. City governments need

to evolve a comprehensive plan to involve local people in sanitation and other urban environmental infrastructure schemes.

Urban poverty alleviation: The major cause of the slow progress of urban poverty alleviation schemes has been lack of involvement of local people and absence of convergence of different support systems. The Swarna Jayanti Shahiri Rozgar Yojana (SJSRY), a modified scheme after the amalgamation of Urban Basic Services for the Poor (UBSP), Nehru Rozgar Yojana (NRY) and Prime Minister's Integrated Urban Poverty Eradication Programme (PMIUPEP), is based on development of community-based organizations aimed at improving the quality of life of the urban poor, by not only providing them with the opportunity of self-employment through subsidized loans, but also by improving prospects of wage employment. But the urban poverty alleviation programmes have been slow in taking off due to non-involvement of the urban poor in the formation of Community Based Organizations (CBOs) like Community Development Societies (CDSs), Neighbourhood Committees (NHCs) and Neighbourhood Groups (NHGs) as observed in the study conducted by the Institute for Development and Communication (IDC) on urban poverty alleviation in Punjab. Local citizens, CBOs, NGOs and other Self Help Groups (SHGs) are important stakeholders and ULBs should evolve partnership relations with them to make poverty alleviation programmes successful.

Slum improvement: Slum improvement programmes, such as the National Slum Development Programme (NSDP), being implemented at the grassroot level by NHCs and CDSs, have failed to provide physical and social amenities, community centres and housing facilities. It is largely due to the lack of participation of slum dwellers, poor convergence of sectoral and departmental programmes and non-formation of CBOs. Active participation of local slum communities through Slum/Neighbourhood Sanitation Committees, Thrift and Credit Societies and CDSs for the upgradation of physical and social infrastructure has become necessary for city-friendly development of slums. ULBs should ensure participation of slum dwellers in slum development activities and poverty alleviation programmes.

HOUSING

Housing and basic services were generally substandard in pre-partition Punjab. The problem multiplied after independence, with increased intensity of population in urban areas. Slum population over the years has grown at a fast pace. This has resulted in substandard housing and houselessness and lack of minimal basic amenities. Land has been becoming scarce in cities and its price sky rocketing. This has constrained the growth of private sector housing. The gap in demand and supply of housing stock has increased, causing over-crowding in existing housing colonies and formation of new slums. Growth of public sector housing is not keeping pace with the demand. The situation is the worst for low-income groups, weaker sections and the Scheduled Caste population. Since housing is beyond the affordability of the poor illegal encroachment of government land is common, and there is mushroom growth of unauthorized slum colonies.

Housing is a state subject, though the central government, through its different institutions, such as HUDCO, National Housing Bank (NHB), Building Material and Technology Promotion Council (BMTPC) and National Urban Infrastructure Development Finance Corporation (NUIDFC) has been making efforts at different levels.

Currently, these organizations are striving to improve housing stock and upgrade urban infrastructure. The state Government earlier through the Housing Board and now from 1995 onwards through Punjab Urban Development Authority (PUDA), is involved in land development and construction of houses, commercial complexes and shops in cities and towns of Punjab.

Despite a quantitative increase in the housing stock over successive decades, the housing situation in Punjab continues to be unsatisfactory. A study conducted by the Socio- Economic Research Foundation (SERF), New Delhi, for the Ministry of Urban Affairs and Employment, Government of India, and the Department of Housing and Urban Development, Government of Punjab, has estimated the shortage of housing in Punjab. This is shown in Table 29.

Table 29
Estimated Housing Shortage in Urban Areas of Punjab in 1995, 1997 and 2002

S No.	Particulars	Shortage in urban areas		
		1995	1997	2002
1	Projected urban population	66,47,080 (68,08,518)	69,88,366 (72,56,857)	78,93,802 (85,11,156)
2	Size of household	5.62	5.62	5.60
3	Number of households	11,82,754	12,43,481	14,09,607
4	Total housing stock	12,16,360	12,72,445	14,28,454
5	Number of vacant houses	1,01,201	1,04,086	1,12,562
6	Available housing stock	11,15,159	11,68,359	13,15,892
7	Houses needed for decongestion	93,438	98,235	1,11,359
8	Replacement of unserviceable kutchha houses	3,134	3,295	3,740
9	Replacement of other houses in bad condition	29,983	31,522	35,729
10	Allowance for vacancy for covering Shortages	-	-	8,017
11	Housing shortages (3-6) +7+8+9+10	1,94,150	2,08,174	2,52,560

Source: Study on *Preparation of Sectoral Housing Action Plan: Punjab State*, SERF, 1996, New Delhi.

Note: Population figures in parenthesis (s. no.1) have been calculated on the basis of ACGR of urban population of Punjab recorded by the Census of India during 1991 & 2001.

Requirement of funds and land for housing in urban areas during 1995 to 2002, estimated by SERF, is as below:

Funds	Rs. 11,304.18 crore
Land	5,012.76 hectares

Out of Rs. 11,304.18 crore, required for financing urban housing (1995-2002), Rs. 11,087.74 crore was for construction of new houses, Rs. 80.89 crore for structural upgradation of houses and Rs. 136.55 crore for additions to existing houses. Out of 5,012.76 hectares of urban land required for housing during 1995-2002, 1,065.97 hectares were needed during 1995-97 and 3,946.79 hectares during 1997 to 2002.

Requirements of funds and land, based on the projection of population growth, is on the lower side. If the actual population growth is considered (as shown in parenthesis in

Table 29), which is considerably higher than the projected population, the housing shortage will go up and so will the requirement for funds and land for housing. Housing, being a self-help activity, has not received much attention from the public sector. The state has been engaged in the construction of houses for its employees. Moreover, plan outlays for housing have not been adequate. Table 30 shows approved plan outlays and expenditure on housing in Punjab for the Eighth, Ninth and Tenth Five Year Plans.

Table 30
Approved Plan Outlay and Expenditure on Housing Including Police Housing (Rs. in crore)

Plans	Approved outlay	Percentage of total outlay	Expenditure	
			Actual expenditure	Percentage of total expenditure
Eighth Five Year Plan	229.74	3.50	266.01	4.21
Ninth Five Year Plan	252.85	1.77	148.64	1.34
Tenth Five Year Plan	165.67	0.71	--	--

Source: *Ninth and Tenth Five-Year Plans of Punjab*, Department of Planning, Government of Punjab

Table 30 shows that the approved outlay, percentage of total outlay, actual expenditure and percentage share of housing in total expenditure have declined sharply. It is worth mentioning that housing has been allocated a negligible amount in the Tenth Five Year Plan, despite huge requirement of funds and land. The criticality of the situation is that EWS housing for vulnerable sections is not receiving any attention, as the state government is involved in construction and maintenance of houses for senior officers, legislators and guest houses at Chandigarh, New Delhi and district headquarters in Punjab. Housing for the police force is another priority area, which is siphoning off a considerable portion of the plan outlay.

The current phase of economic development under the liberalization regime has opened up new options for financing housing. Such specific instruments as 'bonds' can finance housing and infrastructure services. Institutional finance from HUDCO, NHB, NUIDFC, LIC and commercial banks is now available without much difficulty, if land is earmarked and made available by ULBs or PUDA. Disbursements by housing finance institutions have shown impressive growth.

The following steps have been taken by the Government of India to strengthen the housing finance mechanism and promote public-private partnership to accelerate the pace of housing construction, especially for economically weaker sections:

- Hundred per cent foreign direct investment is permitted in urban infrastructure projects under the Foreign Investment Policy in all major areas of urban development, such as housing, commercial premises, hotels and resorts.
- Private initiative is welcome in such sectors as water supply, sanitation, public transport, housing and urban development. Non-Resident Indians (NRIs)/Person of Indian Origin (PIO)/Overseas Corporate Bodies (OCBs) are permitted to invest in housing and real estate development upto 100 per cent on a repatriable basis.

- The Government of India is committed to provide investment incentives in the form of:
 - A ten-year, 100 per cent tax holiday to enterprises responsible for developing, maintaining or operating water supply, sanitation and sewerage projects.
 - Interest-income and long-term gains of an approved infrastructure capital fund or an infrastructure capital company, from investments made in shares or long-term finance in any enterprise engaged in any area of infrastructure development, are exempted from tax, subject to fulfillment of prescribed conditions.
 - The Union Government has set up the URIF with an initial allocation of Rs. 500 crore, to provide reform-linked assistance to states, incentivise reforms in rent control laws, simplify the legal and procedural framework for conversion of agricultural land for non-agricultural purposes and to revise of bylaws to streamline the process of construction of buildings and development of sites.
 - Housing has been declared a priority area and government has repealed the Urban Land (Ceiling and Regulation) Act, 1976. It has already come into force in Punjab and will release urban land for housing and infrastructure development.
- The NHB has commenced securitization of housing loans and is operationalizing foreclosure of mortgages, to strengthen housing finance, It has also decided to launch a 'Mortgage Credit Guarantee Scheme', which would be provided to all housing loans, thereby fully protecting lenders against default. This will make housing credit more affordable, thereby increasing access to housing credit to low income groups.
- As a follow-up of the National Agenda on 'Housing for All', the Government of India formulated the National Housing and Habitat Policy in 1998. It aims at:
 - Creation of surplus in housing stocks either on rental or ownership basis.
 - Providing quality and cost-effective shelter options, especially to the vulnerable groups and the poor.
 - Removing legal, financial and administrative barriers to facilitate access to land, finance and technology.
 - Forging strong partnerships between private, public and co-operative sectors to enhance the capacity of the construction industry to participate in every sphere of housing and habitat.
 - Using technology for modernizing the housing sector, to increase efficiency, productivity, energy-efficiency and quality.

The National Housing and Habitat Policy (NHHP) has laid down the role of all stakeholders, i.e., the Central Government, State Government, public/private housing finance companies, development authorities, corporate-private-co-operative sectors and research and technology transfer organizations, to achieve the goal of 'shelter for all'.

It is in the context of the above reforms, supporting housing projects, that the Punjab Government should benefit from reform-linked assistance from the Union Government. Efforts should be made to conform to the objectives set by NHHP. Since the Union Government is committed to provide support in the form of equity contribution, concession/incentives and a transparent regulatory mechanism, the State Government should remove all legal, administrative and regulatory barriers to access to housing

finance, construction and land development. It should declare housing a priority area in the annual plans.

The present situation indicates that HUDCO, Housing Development and Financial Corporation (HDFC) and the nationalized banks are not helping vulnerable groups adequately for housing activities and the housing backlog is increasing every year. Urban infrastructural requirements, particularly land assemblage, development of land, trunk and peripheral services, power, water and sewerage, and agencies and sources of financing for the next five years, need to be identified and a linkage established with the institutions concerned to ensure success of the programmes. The private sector has plenty of money and the state government should tap this buoyant source for financing housing and urban infrastructure activities.

The state government has constituted PIDB, to act as a nodal agency for implementing infrastructure and urban development programmes. A PUDF has been created to meet the needs of finances for urban infrastructure. Punjab Infrastructure Fund Rules, 2001, and Punjab Infrastructure (Development and Regulation) Act, 2002 are landmark measures designed to boost infrastructure development activities in the state. The Act should promote public-private partnership and private-sector participation in development and operation and maintenance of urban infrastructure, including housing.

The existing institutional set-up does not meet the needs of the houseless population. Housing is a complex problem and has several dimensions. A good housing project should have adequate basic services, such as water supply, sewerage, drainage, solid waste management, electricity and streetlights, etc., and a good location. *This requires* co-ordination with several departments and agencies. Therefore, an institutional set-up should be identified for converging essential activities for supporting and implementing housing projects. At the district level, 'Housing Action Plans' should be prepared with special focus on houseless urban population and economically weaker sections.

As a follow-up to NHHP, the state government needs to liberalize the legal and regulatory regime, promote participation of the private sector and co-operatives in housing, undertake appropriate reforms for easy access to land and empower ULBs to discharge their responsibilities in regulatory and developmental functions. The role of the state must be changed from that of a builder to an enabler, or facilitator. Punjab Urban Development Authority (PUDA) also needs to revamp and redefine its role for facilitating land-assembly and development of infrastructure. It should move away from direct construction activity and forge partnerships with the private sector and co-operatives for housing construction in an efficient manner, by devising flexible schemes to meet the users' requirements. The corporates, State and Central Governments, private sector and co-operatives should work together for land assemblage, construction of housing and development of amenities. The private sector, co-operatives and NGOs should collaborate with the state government/PUDA for construction of houses and work out schemes for slum rehabilitation/reconstruction/development on a cross-subsidization basis. Finance companies should redefine their role and devise schemes to lend at affordable rates to those who are in dire need of housing-finance support. Funds could be mobilized from provident funds, insurance funds and mutual funds to finance housing activities. Low-cost and locally available material and user-friendly technologies should be adopted to promote city-friendly and eco-friendly housing construction.

Social housing schemes for EWSs and LIGs, under implementation in Punjab with state plan provision and loan assistance from HUDCO and other financial institutions, should make housing more affordable for vulnerable groups. The rate of interest should be brought down to promote housing for the urban poor, including pavement dwellers living below poverty line (BPL). The Night Shelter Scheme for pavement dwellers, initiated during the Eighth Plan and modified in 1992, should be revitalized to construct community night shelters with basic civic amenities. Efforts should also be made to make the Night Shelter Scheme self-supporting in maintenance.

There is a need to explore the possibility of external assistance for housing projects. Such organizations as Kreditanstalt für Wiederaufbau (KfW), IBRD and ADB have provided loan assistance/grants to HUDCO for construction of houses for economically weaker sections. Housing, being a capital-intensive activity, needs huge funds. Efforts should be made by Central as well as State Governments to attract external assistance from international agencies, as soft loans and grants for housing for underprivileged sections.

The housing agenda must promote accessibility of the urban poor to housing and basic amenities. Central and State housing agencies should concentrate on low-cost, affordable housing for the poor, integration of income generation programmes with housing activities, easier availability of loans and grants to purchase land and material, assistance for construction of individual houses, and simplification of legal and documentation procedures involved in the above activities. Such cities as Ludhiana, Amritsar, Jalandhar, Patiala, Ferozpur and some other class I and class II towns have a higher concentration of houseless population, as well as people below poverty line. These cities and towns need special attention. Slums and squatter settlements should be given preference and separate housing schemes introduced for people living below poverty line. A viable credit system should be developed to provide services to informal-sector housing.

SLUM DEVELOPMENT

There is lack of consensus on a uniform definition of slums. Section 3 of the Slum Areas (Improvement and Clearance) Act of 1956 has defined slums but the definition is not comprehensive. The Census of India, 2001, has defined slums as 'all areas notified as slums by the state/local government under any Act', and 'all areas recognized as slum by state/local government, which have not been formally notified as slum under any Act' and 'a compact area of about 300 population or about 60-70 households or poorly-built congested tenements, in unhygienic environment, usually with inadequate and lack of any proper sanitary and drinking water facilities'.

There is mushrooming growth of urban slums in Punjab. This is largely due to shortage of low-cost housing, high price of land and unabated migration of workforce from rural to urban areas. Slums present a very dismal picture of an habitat unfit for human habitation, with or without minimal basic amenities and civic services. They have serious deficiencies of water supply, sewerage and solid waste management. Physical, environmental and socio-economic decline is visible in every area of life in the slums. High levels of air, water and soil pollution affect the health of the slum dwellers as well as other urban people.

The Census of India, 2001, after forming 'enumeration blocks' for slums, collected data from 28 towns (10 class I and 18 class II towns as per 1991 Census), except Mohali, where no slum pocket was identified. Table 31 shows slum population in Punjab in 2001.

Table 31
Slum Population in Punjab, 2001

Particulars	2001
Population living in slum pocket/areas in the state (in lakh)	11.52
Total population of the 28 towns in which slums have been identified (in lakh)	58.88
Percentage of slum population of 28 towns to the total population of these towns	19.56
Percentage of slum population to total urban population of the state	13.97
Percentage of slum population to total population of the state	4.74

Source: *Census of India, 2001*

Table 31 shows that Punjab has 11.52 lakh slum dwellers. A considerable percentage of urban people live in slum-like conditions, but have not been included in the overall total of slum dwellers, as the Census has not considered slums of all the towns. If slums of all towns were included, the slum population would go up. A Compendium on Indian Slums, prepared by the Town and Country Planning Organization of the Ministry of Urban Development, Government of India, has shown higher slum population in Punjab, i.e., 14.10 lakh (23.60% of the urban population) in 1996.

The National Report on Environment and Development, submitted by the Government of India to the United Nations Conference on Environment and Development (Rio Conference), held in 1992, shows that 'the growth rate of slum population in Indian cities, largely through continuing migration is significantly faster than that of other segments of urban population. Indian cities also have very high levels of air and water pollution'. Poor people settle in slums because of availability of low-cost housing and transportation close to workplaces. The *National Commission on Urbanization (1988)* too states that 'urban centres have generated the most brutal and inhuman living conditions, with large sections of the citizens living in squatter settlements. The overcrowding in the slums and the desperate lack of water and sanitation leads not only to severe health problems but to abject degradation of human life' (cited in *CMAG Newsletter 2002*). Punjab is no exception to this. In this context, the pace of slums formation and the enormous numbers involved, make it one of the major challenges for urban policy makers.

The Central Government, through different legislations, such as Slum Areas (Improvement and Clearance) Act, 1956, and Urban Land (Ceiling and Regulation) Act of 1976; schemes/ programmes, such as Environmental Improvement of Urban Slums (EIUS) of 1992; Integrated Child Development Services (ICDS), 1975; Urban Community Development Programme, 1979; UBSP, 1990; NRY, 1989; PMIUPEP, 1995; NSDP, 1996; and SJSRY, 1997 are all aimed at eradicating poverty, improving housing and environmental conditions and upgrading the level of basic amenities and civic services. The EIUS has not been implemented seriously by the Government of Punjab. This is reflected in the non-utilization of funds. Out of an approved outlay for EIUS in the Ninth Plan, as much as Rs. five crore could not be used at all. Only Rs. 1.5 crore could be

actually spent on slum improvement projects. The progress of other centrally/state-funded schemes is equally poor and the slum problem continues to loom large.

Such schemes as NSDP, which is fully funded by the Government of India, have not been implemented effectively. The NSDP, launched in 1996-97, aims at providing basic amenities and infrastructure in slum areas of ULBs. Though the Government of India has so far released Rs. 34.79 crore, only Rs.14.14 crore have been released to SUDA by the Finance Department of Punjab. The State Government must utilize the full amount released for NSDP.

The state government, through slum rehabilitation/clearance and resettlement programmes, has been trying to improve slums. Studies indicate that rehabilitation schemes have not concentrated on the genuine needs of the slum dwellers. They are provided plots/houses far from their workplaces and that too without adequate basic amenities, civic services and transportation facilities. The corporate sector has not provided adequate housing facilities for their employees and hence poor wages force them to live in slums. Slum dwellers also have a tendency to sell plots/houses allotted to them and again come back to the same location or establish new slums at some other place. There is need to make strict rules to prevent this.

The state government must work to achieve the objectives of Draft National Slum Policy (NSP). It needs to formulate a well thought-out state slum policy, which could be the basis for the development of a strategy for slum improvement on a sustainable basis. The goal of a slum development strategy should be to provide physical and social amenities, ensure urban poverty alleviation and protection of urban environment. It should concentrate on the establishment of community-based organizations and strengthening the municipal support system. ULBs have to play a pivotal role in slum development and poverty alleviation. Efforts need to be made to promote poor-friendly urban governance through legislations, regulatory mechanisms, monitoring and transparency, with the active participation of the slum dwellers and other stakeholders. The convergence of sectoral and departmental schemes on housing, urban development, poverty alleviation, education, health, self-employment and wage-employment is important to achieve the objectives of the Draft National Slum Policy and the proposed state slum policy.

The state government should make efforts to attract financial assistance/grants from such international agencies as the United Nations Centre for Human Settlements (UNCHS), which focuses on upgradation of habitat, housing and environment in urban areas; IHS (Netherlands); United Nations Children Education Fund (UNICEF), working for the welfare of women and children in urban areas; USAID; Ford Foundation; City Alliance; World Bank; Department for International Development (DFID, UK) focusing on capacity-building of city managers, reform of financial institutions and expansion and upgradation of urban environmental infrastructure; and such research networks as the International Group on Law and Urban Space (IRGLUS), working for tenure-security and related issues in urban areas.

URBAN POVERTY ALLEVIATION

Poverty is a multidimensional and multifaceted problem that represents deprivation in its starkest form. James D. Wolfenshon, President of the World Bank, has rightly pointed out that, 'Poverty amid plenty is the world's greatest challenge' (*World Development Report 2000-01: Attacking Poverty*). The Working Group on Urban Poverty, appointed by

the *National Commission on Urbanization (1988)*, observed that, 'the most demanding of urban challenges, unquestionably, is the challenge posed by urban poverty; the challenge of reducing exploitation, relieving misery and creating more humane conditions for working, living and growth for those disadvantaged people who have made the city their home already or are in the process of doing so. The task of adequately feeding, educating, housing and employing a large and rapidly growing number of under-nourished, semi-literate, semi-skilled, underemployed and impoverished city dwellers who are living on pavements, in poorly serviced chawls, in unhygienic slums, in illegal squatters and other forms of degraded and inadequate settlements and who are struggling to make a living from low paying and unstable occupations, in a reasonable time span is the essence of development challenge facing the Indian planners today'. (Cited in Sabir Ali, 2000).

According to the *Economic Survey of Punjab (2000-01)*, 'poverty, in a broad sense does not refer to deprivation with reference to a minimum basket of goods and services that are essential for existence, it also includes socially perceived deprivation with respect to individual basic needs like shortfalls in health and education, inadequacy of shelter and deprivation associated with rigidities in social stratification'.

Measurement of Absolute Poverty in Punjab

The poverty line is a measure of absolute poverty and the Planning Commission of India (PCI) estimated state-specific poverty lines using their original identification by the Lakdawala Committee and updating them to 1999-2000 prices using the Consumer Price Index of Industrial Workers (CPIIW) for urban households and Consumer Price Index for Agricultural Labourers (CPIAL) for rural households. The poverty line of Punjab and some selected states is given in Table 32.

Table 32
State-specific Poverty Line in 1999-2000 (Rs. per capita per month)

State	Rural	Urban
Andhra Pradesh	262.94	457.40
Assam	365.43	343.99
Bihar	333.07	379.78
Gujarat	318.94	474.41
Haryana	362.81	420.20
Himachal Pradesh	367.45	420.20
Karnataka	309.59	511.44
Kerala	374.79	477.06
Madhya Pradesh	311.34	481.65
Maharashtra	318.63	539.71
Orissa	323.92	473.12
Punjab	362.68	388.15
Rajasthan	344.03	465.92
Tamil Nadu	307.64	475.60
Uttar Pradesh	336.88	416.29
West Bengal	350.17	409.22
Delhi	362.68	505.45
All India #	327.56	454.11

Source: Planning Commission of India, New Delhi

Note: # The poverty line (implicit) at all-India level is worked out from the expenditure class-wise distribution of persons and the poverty ratio at all-India level. The poverty ratio at all-India level is obtained as the weighted average of the state-wise poverty ratio.

The urban poverty line of Punjab is only slightly higher than in Bihar, and considerably lower than in Uttar Pradesh, Orissa, Rajasthan and the all-India average. The data on urban poverty estimates, based on these poverty lines, do not seem to convey the real picture and raise a number of methodological issues. The poverty line of Punjab, with second highest per capita income, has been fixed at the bottom along with Bihar. The measurement of the poverty line has not captured all vulnerable sections, that do not have access to housing, wage employment, basic amenities and civic services. There is a high concentration of population below poverty line and a slight upward revision of the urban poverty line could increase the number of poor considerably.

Changing Poverty Scene: Trend of Urban Poverty from 1973-74 to 1999-2000

The Planning Commission has estimated the incidence of poverty at national and state levels, using the methodology formulated in the Report of the Expert Group on Estimation of Proportion and Number of Poor (Lakdawala Committee) and applying it to consumption expenditure data from the large sample surveys on consumer expenditure, conducted periodically by the National Sample Survey Organization (NSSO). Poverty estimates for the years 1973-74 to 1999-2000 are given in Table 33.

Table 33
Poverty Trend in Punjab (in lakh)

NSS Rounds	Year	People below poverty line		
		Rural	Urban	Total
28	1973-74	30.47 (28.21)	10.02 (27.96)	40.49 (28.15)
32	1977-78	18.87 (16.37)	11.36 (27.36)	30.23 (19.27)
38	1983	16.79 (13.20)	11.85 (23.79)	28.64 (16.18)
43	1987-88	17.09 (12.60)	8.08 (14.67)	25.17 (13.20)
50	1993-94	17.76 (11.95)	7.35 (11.35)	25.11 (11.77)
55	1999-2000 (30 day recall basis)	10.20 (6.35)	4.29 (5.75)	14.49 (6.16)

Source: Planning Commission of India, New Delhi.

Note: Figures in parenthesis are percentage of people below poverty line

Table 33 shows that the proportion of urban poor in Punjab has declined from 27.96 per cent in 1973-74 to 5.75 per cent in 1999-2000, a decline of 22.21 percentage points over a period of 26 years. The absolute number of urban poor has also declined by 5.73 lakh during the same period. This decrease in absolute terms was impressive during the period 1993-94 to 1999-2000. It decreased by 3.06 lakh in six years against 3.79 lakh during the 12 years from 1987-88 to 1999-2000.

No doubt the urban poverty in Punjab has declined considerably in the last 30 years. The contribution of the cities to the SDP has also increased over the last three decades. It indicates that the increase in the pace of economic growth and a decrease in urban poverty are inversely related. But what could be termed the paradox of poverty reduction in the state is that despite growing contribution of cities to the state and national income, poverty exists in towns and cities, not in terms of the minimum per capita income to consume the required calories for biological existence, but in terms of such deprivations as miserable living conditions due to poor housing, inaccessibility to basic amenities and

civic services, illiteracy and poor health. Decrease in the ratio of urban poor notwithstanding, their absolute number is still substantial. If one adds to this the number of those who are deprived of shelter, basic urban services, education and health, the number of the poor would be much larger.

The incidence of urban poverty is alarming in some of the populous districts of the state. A survey of below poverty-line (BPL) families conducted by the SUDA, Punjab, is indicative of the concentration of BPL families in a few districts (Table 34).

Table 34
Distribution of Urban Poor in Different Districts in Punjab, 2002

Districts	Number of families below poverty line	Percentage
Ludhiana	62431	28.27
Jalandhar	50039	22.66
Patiala	22684	10.27
Amritsar	20292	9.19
Ferozepur	10854	4.92
Sangrur	9365	4.25
Gurdaspur	7467	3.38
Bathinda	6411	2.90
Mansa	5702	2.59
Kapurthala	4537	2.05
Faridkot	4224	1.91
Nawanshahr	3802	1.72
Roopnagar	3732	1.69
Muktsar	3251	1.47
Hoshiarpur	2499	1.13
Moga	1794	0.81
Fatehgarh Sahib	1753	0.79
Total	220837	100

Source: Tenth Five-Year Special Component Plan 2002-2007 and Annual Special Component Plan 2002-03 for Scheduled Caste, Government of Punjab (June, 2002).

Table 34 shows that Ludhiana district has the largest number of families living below the poverty line, i.e., 28.27 per cent, and more than 50 per cent of the total BPL families in the state live in only two districts, i.e., Ludhiana and Jalandhar. Ludhiana, Jalandhar, Patiala, Amritsar, Ferozepur and Sangrur together have about 80 per cent of the total BPL families.

Though decrease in urban poverty in Punjab has been much faster than in several other states, including the national average, this trend may not continue in future with the fast growth of urban population due to migration of rural poor to urban centres and of poor from such neighbouring states as, such Uttar Pradesh, Himachal Pradesh, Jammu and Kashmir, Bihar and Rajasthan with high incidence of poverty. In this context, urban poverty alleviation should be central to the urban development strategy.

The Union and State Governments have been trying to cope with this multi-dimensional problem through various poverty alleviation and infrastructure development programmes, such as EIUS, UBSP, NRY, PMIUPEP, Low Cost Sanitation (LCS), Integrated Development of Small and Medium Towns (IDSMT), NSDP, and recently, SJSRY. The strategy for poverty alleviation has focused on the development of environmental infrastructure, generation of employment and economic growth of cities. Most of the programmes have been directly targeted for poverty alleviation, but have failed to make much impact on the problem, due to a variety of reasons.

An evaluative study of UBSP in Ludhiana and Amritsar, conducted by the IDC (1998) for SUDA, Punjab, indicates several deficiencies in the implementation of poverty alleviation schemes. A few of the shortcomings are mentioned below:

- Slum identification was not done according to well accepted criteria and similarly identification of beneficiaries was not according to the norms of the UBSP.
- Inadequate support structure due to non-representation of beneficiaries, lack of intersectoral representation and co-ordination with line departments, untrained and non-responsive resident community volunteers (RCVs), lack of networking within community organizations and poor community mobilization/participation.
- The quality of training was poor and training provided for skill-upgradation was a mere formality. Such services as drainage and sanitation were poor in slums.
- Sanctioning of loans was arbitrary and beneficiaries were not identified according to the criteria of the scheme. Judged by established norms, the majority of beneficiaries of loans, training and other facilities under UBSP were found ineligible.
- Leakages of loan money were as high as 12 per cent. Delay in processing of loan applications, inadequate raw material inputs and poor marketing of products, were the other shortcomings.
- Skill-upgradation was poor as training of women beneficiaries was limited only to stitching and sewing. Once trained, they were unable to utilize their skills, since there was no linkage between skill-upgradation and setting up of micro enterprises.

It is in the context of the above factors that a plan, based on community participation, particularly of the urban poor, should be prepared to focus on human, social and infrastructure development in clusters occupied by the urban poor. There is need to build partnerships with poor communities for empowering vulnerable groups, especially women and children. Capacity-building of urban poor through Participatory Learning and Action (PLA) techniques will help them to be aware of the range of options available, learn to deal with their own problems and pool resources to become self-reliant. The experience of implementation of programmes successfully in mobilizing women and poverty-reduction in other states can be drawn upon to improve the effectiveness of urban poverty alleviation programmes in Punjab. Special action plans should be prepared for six districts with large numbers of BPL families and efforts made to converge all sectoral and line-departmental schemes targeting urban poverty.

Poverty alleviation (Seventh Schedule of the Constitution) is the joint responsibility of the Union of India and the State Government and one of the core constituents of the Directive Principles of the Constitution of India. Urban poverty alleviation is one of the 18 functions listed in the Twelfth Schedule of the 74th Constitution Amendment Act, 1992. It is in this context that the Union of India, the Government of Punjab and the ULBs of the state should make joint efforts to design policy interventions and implement pro-poor city-friendly programmes for sustainable development of urban areas. Efforts should also be made to pool resources from international financial institutions.

An effective poverty alleviation programme would need to create a proper structure consisting of RCVs and CDSs. They would have to be linked with urban local self-government, as crucial stakeholders in urban governance, for ensuring accountability and transparency. One such model is operating in Kerala, which has one of the most effective systems of poverty alleviation. The Ward Committee, constituted in each ward, has on it representation of the President of the Area Development Society (ADS),

formed by the urban poor in the ward and registered with the municipal government. The Ward Committee's functions include giving assistance for the preparation and encouragement of development schemes within the ward and their implementation, and identification of beneficiaries of welfare schemes. The UBSP strategy in Kerala has led to a movement of urban poor women. Their organizational strength has made them respectable, responsible and equal partners in the development process within and outside their community. Self-Employed Women's Association (SEWA), Ahmedabad, is a movement that has attempted to redress the gender equation at home, the work-place and the community. SEWA members have improved their economic conditions by adding to their assets and work-tools, finding adequate work-space, expanding markets, diversifying into other work activities, stabilizing incomes, gaining access to raw materials and so on (NIUA 2001).

The Kerala Municipality Act, 1994, provides for the constitution of a Poverty Alleviation Fund by the municipal governments. The ULBs are mandated by the Act to contribute two per cent of their revenues to this fund every year for alleviation of poverty. This needs to be replicated in Punjab by amending the municipal legislation. This will integrate the urban poor with the formal system of governance and the implementation of urban poverty alleviation programmes will be effective and sustainable.

The *World Development Report 2000-01* has emphasized 'attacking poverty' through 'empowerment', by strengthening the ability of the poor people to take and shape decisions, to ensure 'security' through protection of the poor from illiteracy, diseases, shocks, disasters and violence, and to provide 'opportunity' by stimulation of economic growth on the basis of 'voices of the poor', of more than 60, 000 people living below the poverty line in more than 60 countries. It is in this context and also in the light of the objectives of the national poverty alleviation programmes, that a state-level 'urban poverty alleviation policy' should be formulated in Punjab. It should emphasize grassroot-level political empowerment of urban poor through the 74th CAA, social development/security and creation of adequate opportunities, with special attention to convergence/integration of various activities related to urban poverty alleviation.

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Chapter 9

DEMOGRAPHIC DEVELOPMENT

INTRODUCTION

This chapter deals with the overall demographic situation in Punjab. The scope is rather mixed consisting of demographic history since the state became a separate entity, comparison with other states, coverage of the elements of population change and their determinants, with a focus on the future population perspectives. An overview of demographic issues is absolutely critical for Punjab because development cannot be assessed in terms of generation of economic growth alone. In order to be more meaningful, it has to address the key objective of reduced population growth for human development, social integration, removal of disparities, economic empowerment and also protection of environment. Profiling of population in the state helps to identify areas that need policy and programme interventions, to set near- and far-term goals, and to decide priorities, besides understanding them in an integrated structure. This chapter contains information from several sources for discussing the recent demographic progress in the state and covers a whole range of issues, such as fertility, nuptiality, mortality, family planning, ageing, sex preference, sex-ratio imbalances and others. It summarizes the demographic dynamics in the state at the beginning of the twenty-first century and highlights the demographic dimensions of development, through an independent assessment.

FERTILITY TRANSITION

Limiting population growth in India is at the top of the national agenda. The First Five Year Plan recognized the 'rapid increase in the growth of population', emphasized the need to reduce the birth rate to stabilize the population, and suggested some measures to be taken (Planning Commission 1952). As a result of socio-economic development and family planning intervention, India recorded significant fall in fertility in the post-independence period, fairly widespread across the states. Yet, regional variations have continued in the onset and speed of fertility transition in the country. Initial achievements of Kerala, in leading the fertility decline in India, is being widely replicated elsewhere. In the north, Punjab has undergone substantial transformations in its fertility profile during the last three decades of the twentieth century. Data from well-known sources, notwithstanding the differences they have among themselves about the pace as well as magnitude of the decline, confirm a sustained decline in fertility in the state.

Levels and Trends

Fertility has been falling consistently in Punjab, as indicated by trends in total fertility rates since the beginning of the 1970s for major Indian States (Table 1). Though the southern states are ahead in fertility transition and have total fertility rates lower than Punjab, the fall has been substantial in the state. After Kerala, Punjab is the second state in the country to have reduced the total fertility rate approximately by half, from the early seventies to the late nineties in a totally different socio-cultural environment (Table 1). In fact, there has been a suggestion that Kerala in southern India and parts of erstwhile Punjab, currently in India, experienced simultaneous onset of fertility decline in

the 1940s, though the environment that triggered tapering off of fertility varied considerably from the setting of human development in Kerala to economic development in Punjab (Das Gupta 1997). However, the early declines in fertility in Indian Punjab were not sustained, fluctuating more rapidly in response to immediate conditions of war, health, and famine in the vicinity and in some districts, and recovering thereafter. The origin of the current trends of fertility fall in Indian Punjab can be traced back to the mid-1950s in the post-partition situation (Dyson 2001), though the 1970s signal a secular fall in birth rates according to the sample registration system (SRS).

Table 1
Fertility Decline in Major Indian States (1970-72 to 1996-1998)

State	Total fertility rate (TFR)				Percent decline in TFR				
	1970-72	1980-82	1990-92	1996-98	1971-81	1981-91	1971-91	1991-97	1971-97
A. P.	4.7	3.9	3.0	2.5	17.0	23.1	36.2	20.0	48.9
Assam	5.5	4.1	3.4	3.2	25.5	17.1	38.2	5.9	41.8
Bihar	--	5.7	4.6	4.4	--	19.3	--	6.5	--
Gujarat	5.7	4.4	3.2	3.0	22.8	27.3	43.9	6.3	47.4
Haryana	6.4	5.0	3.9	3.4	21.9	22.0	39.1	12.8	46.9
H. P.	4.7	4.0	3.1	2.4	14.9	22.5	34.0	22.6	48.9
J. & K.	4.8	4.4	3.3	--	8.3	25.0	31.3	--	--
Karnataka	4.4	3.6	3.1	2.5	18.2	13.9	29.5	19.4	43.2
Kerala	4.1	2.9	1.8	1.8	29.3	37.9	56.1	0.0	56.1
M. P.	5.7	5.2	4.6	4.0	8.8	11.5	19.3	13.0	29.8
Maharashtra	4.5	3.7	3.0	2.7	17.8	18.9	33.3	10.0	40.0
Orissa	4.8	4.2	3.3	3.0	12.5	21.4	31.2	9.1	37.5
Punjab	5.3	4.0	3.1	2.7	24.5	22.5	41.5	12.9	49.1
Rajasthan	6.3	5.4	4.5	4.2	14.3	16.7	28.6	6.7	33.3
Tamil Nadu	3.9	3.4	2.2	2.0	12.8	35.3	41.0	9.1	48.7
Uttar Pradesh	6.7	5.8	5.2	4.8	13.4	10.3	22.4	7.7	28.4
West Bengal	--	4.2	3.2	2.6	--	23.8	--	18.8	--
INDIA	5.2	4.5	3.7	3.3	13.5	17.8	28.8	10.8	36.5

Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

Note: '--' Indicates data not available.

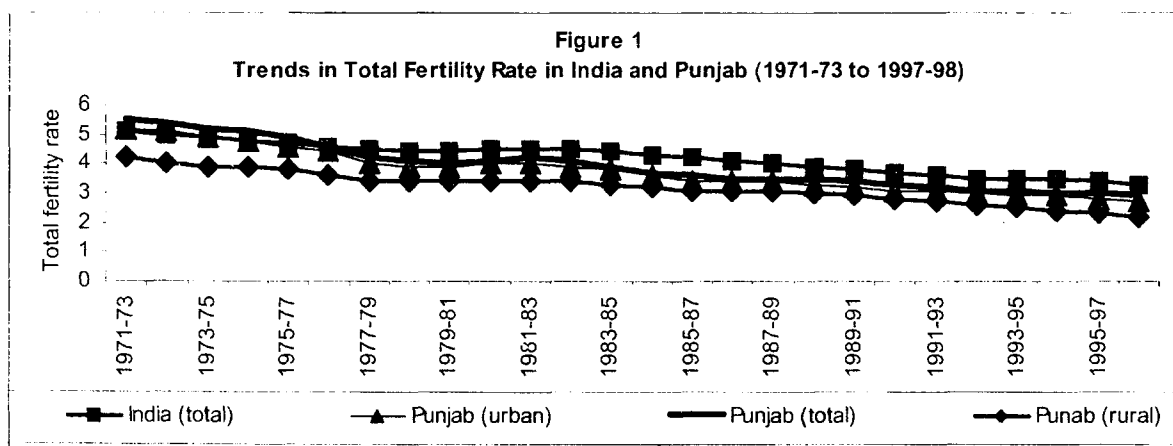
The three-years' moving averages of the SRS are stable enough to describe effectively the shifting pattern of fertility in the state. Except for 1977-79 to 1982-84, during which the decline stalled, the process of fertility transition was reasonably consistent in Punjab (Table 2, Figure 1). Diminishing crude birth rate (CBR) and total fertility rate (TFR) point towards a new environment of reproduction where modifications in the reproductive strategy of couples reflect preference for progressively smaller families. The decline in fertility is extensive in the state, and is not confined to any specific region or community. Rural and urban areas in each district are experiencing transition in fertility in different ways, depending on changes in local conditions, which often act as important inducements for the determination of family size. The substantial decrease in fertility in Punjab, despite some of the key social indicators, such as strong son preference, sizeable presence of a socially backward population and relatively higher infant mortality, being against the decline, is a manifestation of the primacy of intervention by selected development factors, namely, the family planning programme, female literacy and prosperity at the household level. Studies are virtually non-existent to assess the role of economic aspirations, family systems and social status indicators in the fertility transformations in Punjab.

Table 2
Levels and Trends in Crude Birth Rate (CBR)
and Total Fertility Rate (TFR), India and Punjab (1971-73 to 1998-2000)

Period	India		Punjab					
	CBR	TFR	CBR			TFR		
	Total	Total	Total	Rural	Urban	Total	Rural	Urban
1971-73	36.3	5.1	34.1	35.1	30.4	5.2	5.5	4.2
1972-74	35.3	5.0	33.3	34.4	29.3	5.1	5.4	4.0
1973-75	34.8	4.9	32.4	33.3	29.0	4.9	5.2	3.9
1974-76	34.4	4.8	31.8	32.7	28.6	4.8	5.1	3.9
1975-77	34.2	4.7	31.5	32.2	28.6	4.6	4.9	3.8
1976-78	33.3	4.6	30.7	31.5	27.7	4.4	4.6	3.6
1977-79	33.1	4.5	29.9	30.5	27.6	4.0	4.2	3.4
1978-80	33.3	4.4	29.3	29.8	27.7	3.9	4.1	3.4
1979-81	33.8	4.4	29.6	30.0	28.3	3.9	4.0	3.4
1980-82	33.8	4.5	30.2	30.7	28.5	4.0	4.1	3.4
1981-83	33.8	4.5	30.3	30.8	28.7	4.0	4.2	3.4
1982-84	33.8	4.5	30.3	30.9	28.7	3.9	4.1	3.4
1983-85	33.6	4.4	29.7	30.1	28.3	3.8	3.9	3.3
1984-86	33.2	4.3	29.1	29.6	27.9	3.6	3.7	3.2
1985-87	32.6	4.2	28.6	28.9	27.7	3.4	3.6	3.1
1986-88	32.1	4.1	28.6	29.0	27.7	3.4	3.5	3.1
1987-89	31.5	4.0	28.5	28.8	27.6	3.4	3.5	3.1
1988-90	30.8	3.9	28.1	28.6	26.8	3.3	3.5	3.0
1989-91	30.1	3.8	27.9	28.4	26.2	3.2	3.4	2.9
1990-92	29.6	3.7	27.5	28.2	25.1	3.1	3.3	2.8
1991-93	29.1	3.6	27.0	27.4	24.1	3.1	3.2	2.7
1992-94	30.4	3.5	26.1	27.4	22.9	3.0	3.2	2.6
1993-95	29.9	3.5	25.3	26.6	21.8	2.9	3.1	2.5
1994-96	27.4	3.5	24.3	25.8	20.6	2.9	3.0	2.4
1995-97	27.7	3.4	23.9	25.4	19.6	2.8	3.0	2.3
1996-98	27.1	3.3	23.2	24.6	18.9	2.7	2.9	2.2
1997-99	26.6	--	22.4	23.7	18.7	--	--	--
1998-2000	26.1	--	21.8	22.9	18.5	--	--	--

Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

- Note:**
1. Rates for India exclude Mizoram till 1995, and Jammu and Kashmir from 1991 onwards
 2. '--' Indicates data not available.



Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

Replacement Level of Fertility

With fertility falling significantly in Punjab during the past three decades, it is appropriate to look at the long-term prospects of reaching the replacement level. Since achievement of replacement-level fertility is crucial for the long-term objective of a 'Stable Population' by 2045 in India, and the medium-term objective of reducing the total fertility rate (TFR) to replacement level by 2010, as laid down in the National Population Policy 2000 (NPP 2000), it is pertinent to examine the position of Punjab in relation to the national target. Recent indications do not signal the possibility of reaching the replacement level in the state by 2010. While according to SRS estimates, Kerala and Tamil Nadu reached the replacement level by 1998, the recent National Family Health Survey (NFHS) indicates that only Kerala has reached this level by 1998-99. Punjab, according to both, is yet to attain the replacement level of fertility. NFHS estimates the state's fertility to be five per cent above the replacement level as against the SRS estimate of 24 per cent. According to recent NFHS, urban areas have already reached the replacement level of fertility (TFR being 1.79), whereas in the rural areas the fertility (TFR being 2.42) remains 15 per cent higher than the replacement level. With nearly two-thirds of the population still living in villages, the prospects of stabilizing the population in the near future in Punjab depends on the success of the effort in rural areas. This is a task worth considering.

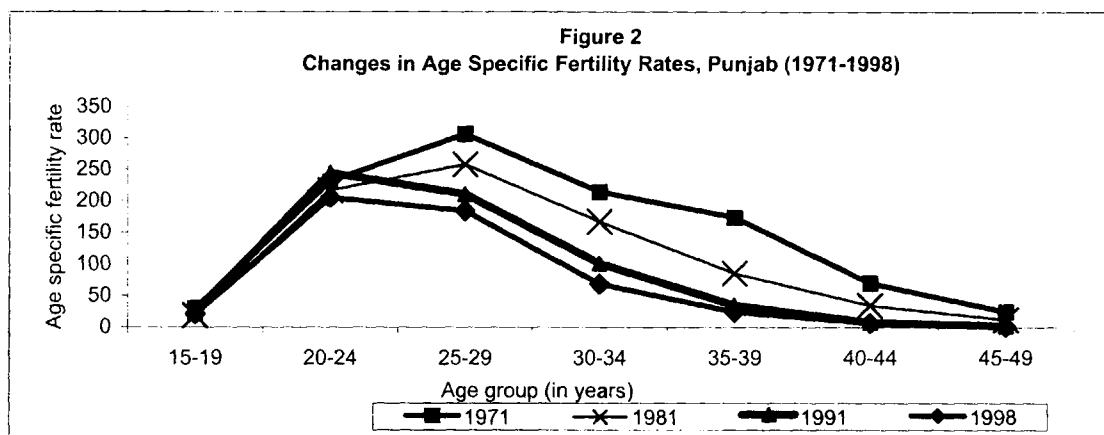
Age Pattern of Fertility

The age pattern of child-bearing in Punjab has undergone a change during the last three decades with fertility limitation being increasingly common at relatively old ages. Though fall in fertility has been observed among women of all ages, the contribution to the fertility decline has been mostly from women in the age 35 years and above, according to the SRS. Two successive rounds of NFHS, recording a rapid fall in fertility, higher than the national standard, in Punjab during the 1990s, also document lesser contribution by younger women (age 15-29) than by older women (age 30-49). Relatively less enthusiasm among younger women in limiting fertility can be attributed to social and cultural reasons that stress the need for child-bearing immediately after marriage. Child-bearing, coming shortly after marriage, is mainly concentrated in 20-24 and 25-29 age groups, which account for 40 and 36 per cent respectively, of the births in the entire reproductive period of women (NFHS 2, 2001). Such concentration of births is more severe among urban than rural women. Between 1991-93 and 1996-98 (the two rounds of NFHS), the contribution of women aged 20-29 years to overall fertility declined from 76 to 72 per cent. Fall of fertility, by this magnitude, may also be regarded as substantial as it is at young age that the pressure to bear children is immense in Punjabi society.

Table 3
Levels and Trends in Age Specific Fertility Rate (ASFR) in Punjab (1971-1998)

Age group (in completed years)	1971	1976	1981	1986	1991	1996	1997	1998	Percent decline in ASFR (1971-98)
15-19	29.9	25.2	18.9	23.2	23.3	14.9	16.4	20.9	30.1
20-24	231.0	244.6	216.7	236.5	244.2	213.8	199.6	205.5	11.0
25-29	306.5	299.6	258.0	234.8	210.8	197.2	204.3	184.2	39.9
30-34	214.3	184.6	166.9	118.2	101.1	86.8	82.5	68.6	68.0
35-39	173.9	134.4	85.5	51.5	34.9	27.3	31.0	24.3	86.0
40-44	68.4	55.3	34.6	16.1	7.5	8.9	9.5	6.9	89.9
45-49	24.7	13.7	12.3	3.9	2.2	4.0	0.5	1.1	95.5

Source: Sample Registration System (SRS), Registrar General, India, New Delhi. Various volumes.



Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

Socio-Economic Differentials

Social and economic conditions considerably determine the course of fertility transition, as fertility varies most according to economic and social backgrounds. In Punjab, fertility differentials are sharp across selected economic and social indicators. As seen from the recent round of NFHS, variations in fertility (measured in terms of differences in total fertility rates, current pregnancy rates, and mean number of children ever born to women in 40-49 age group) by the standard of living, educational attainment, place of residence, religion and caste are striking. For instance, the TFR, of women in households with a low standard of living (3.77) is nearly 2.1 times higher than their counterparts with a high standard of living (1.74), and of illiterate women is 1.8 times higher than that of women with education high school and above (1.71). Women in cities and towns also report lower TFR (1.79) than women in villages (2.42). Since there exists a great degree of concurrence between caste affiliation and economic well-being, inequality in the economic sphere often gets reflected in demographic indicators. In Punjab, Scheduled Caste women and other Backward Caste women record higher levels of TFR (2.93 and 2.55) and percentage of pregnancy rates (6.1 and 5.4) as against women from other castes (1.79 and 3.5). Interestingly, for the two major religious groups that accounted for a little more than 97 per cent of the population in 1991 in the state, differences by religion are narrow. Demographic reflections of social inequalities are clear and still persist, according to the NFHS. Over time, there has been little change in relative positions by social or economic class, in terms of the respective contribution to overall fertility, though the major social and economic groups have shown a decline in current pregnancy rates and fertility.

Age at Marriage, Birth Intervals, Age at First and Last Birth

Marriage patterns are important determinants of fertility and family planning regimes. Traditionally the female age at marriage has been relatively higher in Punjab than the national average (Goyal 1988). The NFHS indicates that in 1998-99, for women aged 25-29, the median age at first marriage was 3.6 years higher in Punjab (20.0 years) than in the nation as a whole (16.4 years). Among the major states, only Kerala had a slightly higher median age at marriage (20.2 years) than Punjab, according to this source. As data from the 1991 Census indicate between 1981-86 and 1986-91, the female mean age at marriage increased by 0.4 years in Punjab as against 0.3 years in the entire

country, excluding Jammu and Kashmir. During 1981-1991, as against 53.3 per cent of currently married women who married before they reached 18 in India, 24.7 married earlier than the legal minimum age in Punjab. Even if the share of such women fell in the state from 21.0 per cent in 1981-86 to 15.7 per cent in 1986-91, there is still need to identify these weaker sections in terms of socio-economic characteristics, and to concentrate on them in order to eliminate the practice of early marriage.

One significant aspect of fertility trends and levels is the frequency of child-bearing, as indicated by the length of birth-intervals. While quick successive pregnancies cause extensive health risks to the mother and the child, those with longer gaps promote child-survival and help in reduction of fertility. Among major states of India, the median interval between two most recent births, according to recent NFHS statistics, is the longest in Kerala (38.1 months) and the shortest in Punjab (28.0 months). In the latter, in nearly six years time, the median birth interval decreased by 1.3 months and the percentage of births occurring within 24 months of previous birth dropped from 35.7 to 33.2, indicating compression of intervals and a move towards bunching of births among the communities. The median birth interval varies substantially by background characteristics and reveals comparatively frequent child-bearing among socially and economically disadvantaged women in Punjab. Rural women, less educated women, women from Scheduled Castes and from households with low standards of living, tend to reproduce faster than others, according to the NFHS. For example, women in low-standard of living households (26.5 months), women with less education (illiterate 27.3 months) and Scheduled Caste women (25.6 months) have shorter birth intervals than women in households with a high standard of living (31.1 months), women having greater education (31.7 months for high school completed and above), and women with non-Scheduled Caste status (30.6 months). Spacing of births is determined by such intervening factors as the practice of contraception, duration of breast-feeding, order as well as sex of the previous birth, in addition to its survival status. The NFHS-2 also reveals that high parity mothers space their last interval longer than the low parity mothers. Similarly, death of the child causes the median birth interval to shrink considerably (from 28.5 months in the case of a surviving child to 24.4 in case of a dead child). The sex of the previous child also affects the frequency of child-bearing through reduction in the median birth interval (by 1.2 months in the case of a daughter). The fact that these birth-interval differentials have persisted for a long time among the ever-married women, as existing studies report (NFHS 1995, 2001 and Abbi et al. 2000), is an indicator of differential approaches to family formation among communities in Punjab.

The age at first birth and the age at last birth are two important indicators that highlight the length of the reproductive period in terms of initiation and cessation of child-bearing. A trend towards shortening of reproductive life in Punjab, in recent times, from 9.0 to 7.4 years has been documented by the NFHS. Between 1992-93 and 1998-99, little change has been observed among women in the state in the onset of fertility, even if the age at which child-bearing is terminated is on the decline. For instance, in both rounds of NFHS, the age at first birth among women aged 25-29, 30-34, 35-39, 40-44, and 45-49 differed little with the median age of first birth, around 21.0-21.5 years. On the contrary, termination of child-bearing earlier is reported in the second survey, with the median age at last birth declining from a little over 30.0 to 28.6 years, for women aged 40-44 years. The data on age at first birth also establish early child-bearing among economically and socially deprived women.

Data on birth-interval, on a long-term perspective, support the idea that strategies of reproduction are changing in Punjab. Couples from diverse backgrounds are giving up the old practice of relatively longer gaps between two successive births or between marriage and the first birth in favour of shorter birth-intervals. Such gradual shortening of birth-intervals, alongside the fertility decline, is in response to a variety of social, economic and other demands, that the society is imposing on the couples for conforming to newer reproductive goals of having fewer children. These aspects are to be factored into population programmes in the state aimed at keeping the birth-intervals longer, more so among weaker sections, so as to delay the first and subsequent births. In other words, further lengthening of intervals is difficult unless female education is increased beyond a threshold level, campaigns are set in motion to increase breast-feeding and programmes are put in the place to reduce infant mortality and substantially eradicate son preference. These are required in addition to addressing economic concerns about raising living standards of households.

Prospects for Further Decline

Pathways to fertility decline are complex, changing and non-universal. As fertility declines in a variety of situations, generalizations about social, cultural and economic causes of fertility decline are not easy and seldom necessary. However, routes to lower fertility in different settings have been historically documented and have extensively improved the understanding of reproduction patterns. In the absence of systematic explorations of receding fertility in Punjab, with a focus on dimensions of development and mechanism of influence, existing evidence point to overall effects of sustained economic prosperity flowing from the green revolution, a well-off rural sector, impact of a strong family planning programme, greater access to health care services, superior infrastructure in terms of housing, roads, transport and basic amenities, improved exposure to education and communication, high female age at marriage, better female literacy as against males, and more recently, induced abortion, etc.

While it is important to acknowledge the fact that fertility has fallen considerably in the state, since the early seventies, despite constraints, it is more useful to explore the prospects of further decline in the near future. The key to this lies in eradicating the existing strong son preference, reduction in the level of infant mortality, augmenting contribution by socially and economically poor sections to lowering of fertility, progress in eliminating the unmet need for contraception, change in reproductive strategies among younger couples and overall advance in living conditions.

MORTALITY CHANGE

Reduction in mortality has been an important goal of planning since the First Five Year Plan. Programmes have been initiated at the national as well as the state level to improve overall survival conditions, as a result of which mortality decline is visible among segments of population in most of India. A dramatic fall in mortality has been also observed in Punjab for last three decades of the twentieth century.

Levels, Trends and Differentials

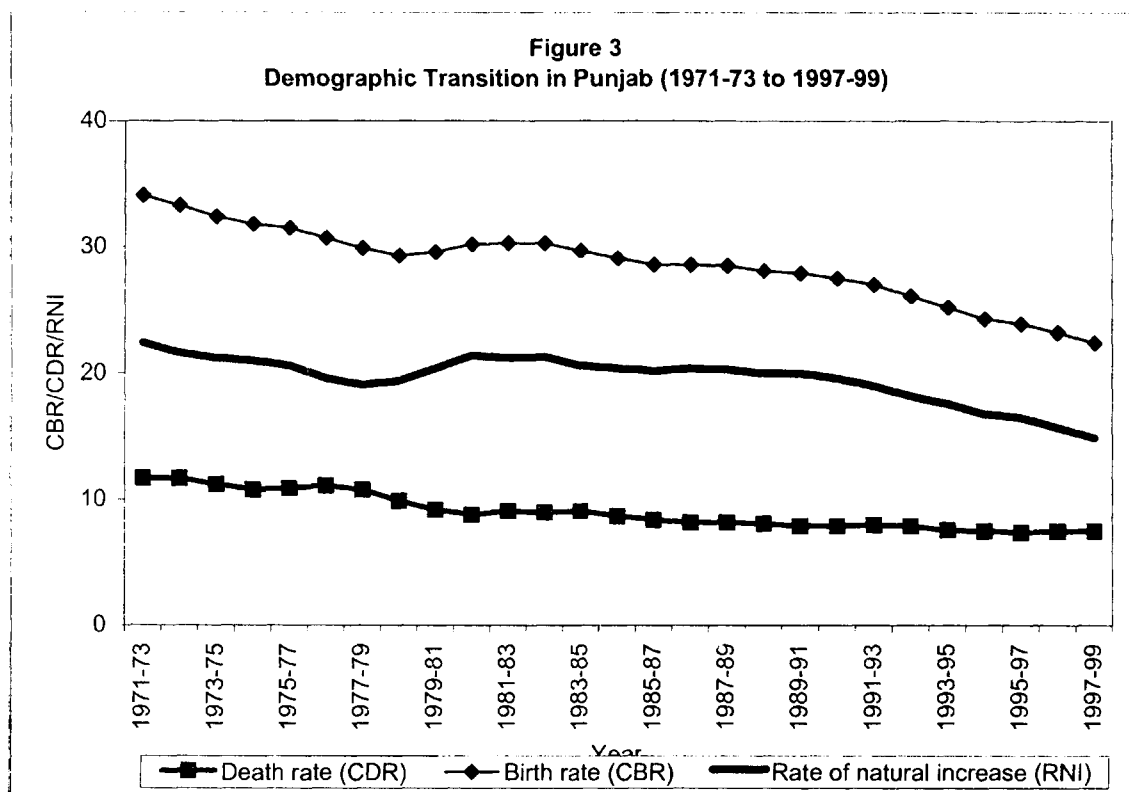
In Punjab, as the time series data based on three-yearly moving average, show, the overall crude death rate (CDR) declined from around 12 per 1,000 in the early seventies,

to around nine per 1,000 in the early eighties, and to eight per 1,000 in the early nineties (Table 4). Reduced mortality has been an integral part of the demographic transition in the state, and has extensively contributed to increased life expectancy at birth and at other ages. Though overall mortality in Punjab has been consistently lower than the national average, yet, over time, the advantage that Punjab initially had, in terms of lower probability of death, has diminished systematically after the mid-eighties. For example, in little less than three decades, the advantage of Punjab over the national mortality situation declined by 12 percentage points, from 26 per cent in 1971-73 to 14 per cent in 1998-2000. This was because the other states had made comparatively faster progress in curbing their respective death rates. Both rural and urban areas have gained consistently from the onset of mortality decline, even if rural death rates continue to exceed urban death rates for a variety of reasons in Punjab, as elsewhere in India. Notwithstanding a marginal rise in the crude death rate in the nineties, as reported by the NFHS, overwhelming evidence shows that overall death rates have decisively fallen in Punjab.

Table 4
Levels and Trends in Crude Death Rate (CDR) in India and Punjab (1971-73 to 1998-2000)

Period	India	Punjab			Comparative advantage of Punjab (in percent)
	Total	Total	Rural	Urban	Total
1971-73	15.9	11.7	12.4	9.1	26.4
1972-74	15.7	11.7	12.5	8.9	25.5
1973-75	15.3	11.2	11.8	8.8	26.8
1974-76	15.0	10.8	11.3	8.9	28.0
1975-77	15.2	10.9	11.4	9.0	28.3
1976-78	14.5	11.1	11.7	9.0	23.4
1977-79	13.9	10.8	11.3	8.6	22.3
1978-80	13.1	9.9	10.5	8.0	24.4
1979-81	12.7	9.2	9.7	7.3	27.6
1980-82	12.3	8.8	9.5	6.7	28.5
1981-83	12.1	9.1	9.8	6.9	24.8
1982-84	12.1	9.0	9.8	6.5	25.6
1983-85	12.1	9.1	10.0	6.6	24.8
1984-86	11.8	8.7	9.5	6.4	26.3
1985-87	11.3	8.4	9.0	6.8	25.7
1986-88	11.0	8.2	8.7	6.9	25.5
1987-89	10.7	8.2	8.7	7.0	23.4
1988-90	10.3	8.1	8.6	6.6	21.4
1989-91	9.9	7.9	8.6	6.1	20.2
1990-92	9.9	7.9	8.7	6.0	20.2
1991-93	9.7	8.0	8.6	5.9	17.5
1992-94	9.5	7.9	8.2	6.1	16.8
1993-95	9.2	7.6	7.9	6.0	17.4
1994-96	9.1	7.5	7.9	6.2	17.6
1995-97	9.0	7.4	7.8	6.1	17.8
1996-98	9.0	7.5	7.9	6.2	16.7
1997-99	8.9	7.5	8.0	6.2	15.7
1998-2000	8.7	7.5	8.0	6.1	13.8

Source: Sample Registration System (SRS), Registrar General, India. Various volumes.



Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

Age- and Sex-specific Death Rate

In addition to rural and urban variations, mortality situation is also better understood through its sex composition and age pattern. Gains to males as well as females from mortality decline are distinct over the years in Punjab (Table 5), with net gain to females, notwithstanding early-age vulnerability surpassing the net gain to males in the process of mortality transition. In fact, a notable feature of mortality transition in Punjab, between 1971 and 1998, has been larger gains for females than for males in general. The narrowing down of sex differential in mortality, characterized by comparatively higher female mortality, as observed in 1971, has yielded to a reverse, yet, more common pattern, as in 1998, where male crude death rate outstripped female crude death rate.

The age-specific mortality curve for Punjab in 1971, as well as 1998, was the usual 'U'-shape, due to relatively higher mortality at young and old ages. Though, for nearly three decades, the mortality pattern by age has remained broadly the same, significant changes seem to have taken place in different segments of the population. Mortality rate at the early age of life (0-4 years) has strikingly plummeted down for males as well as females in urban and rural areas. In the five-to-nine year age group, mortality decline appears to have been confined to males and females only in urban areas, leaving rural female children untouched. Dynamics of mortality change also suggest a trade-off in the mortality of the young and old, between the early seventies and late nineties. For males below 20 years of age, mortality dropped sharply in contrast to a moderate rise for those 20-54 years old, and a substantial rise for those 55 years and above. Similarly, for females, during the same period, the mortality rate fell for those below 45 years and increased for those aged 45 and above. Punjab has recorded gains in the reproductive

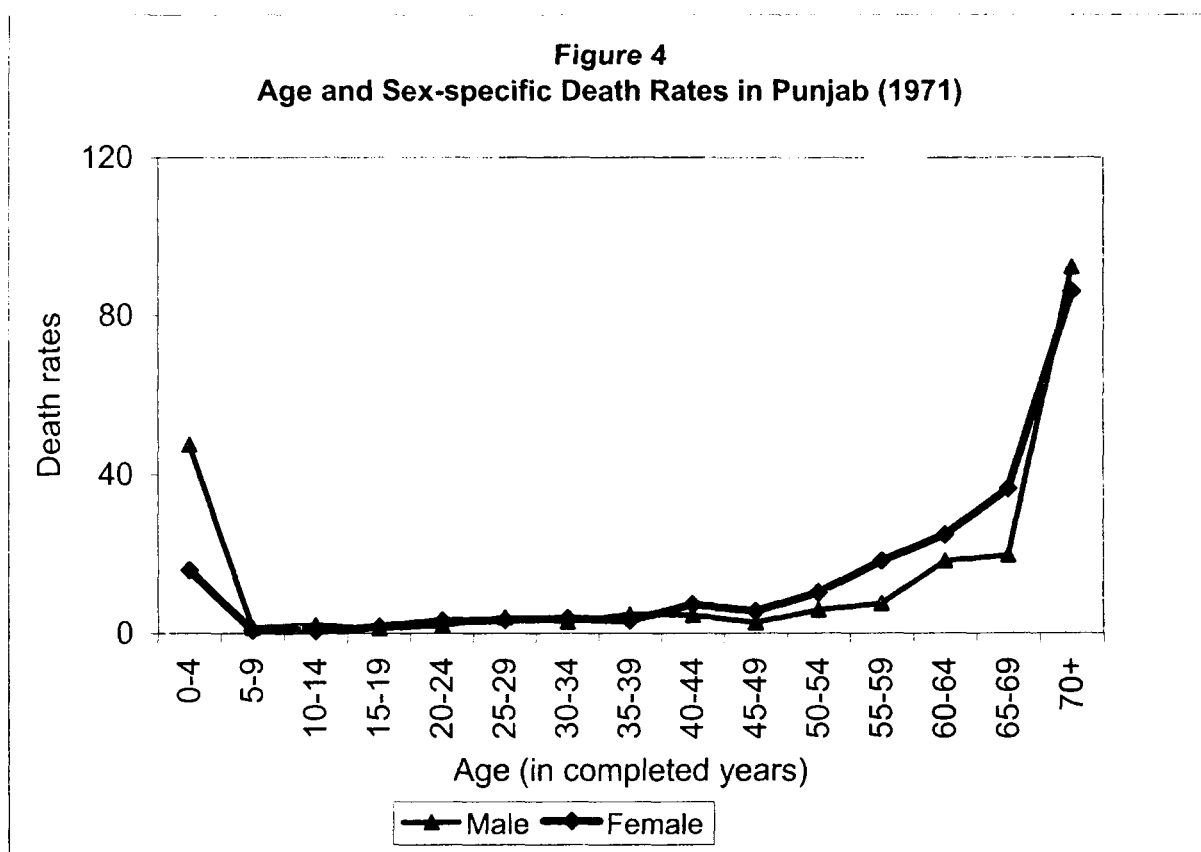
age group (15-44 years) too, where the risks of child-bearing decisively enhances female exposure to death through maternal mortality.

Table 5
Changes in Age-specific Death Rates (ASDR) by Sex in Punjab (1971-98)

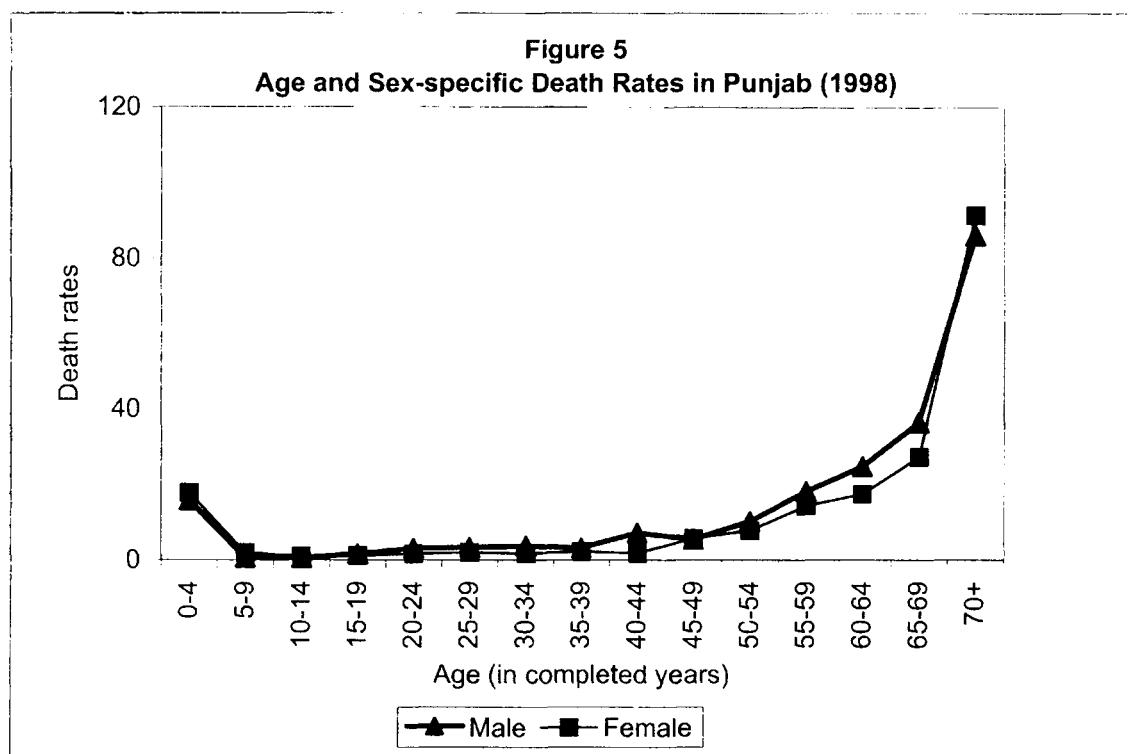
Age (in completed years)	1971						1998					
	Male			Female			Male			Female		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
0-4	32.0	28.4	31.3	52.0	30.8	47.6	16.2	15.0	15.9	20.8	8.6	17.9
5-9	1.6	1.9	1.7	1.0	3.0	1.4	0.8	0.4	0.7	2.2	1.3	2.0
10-14	0.9	--	0.7	2.3	1.2	2.1	0.6	0.7	0.6	0.8	1.6	1.0
15-19	0.8	1.0	0.9	1.2	1.1	1.2	1.5	1.9	1.6	1.4	0.5	1.2
20-24	3.6	0.3	2.8	2.3	1.1	2.0	3.7	1.2	3.1	1.8	0.9	1.6
25-29	2.9	1.2	2.5	4.1	3.5	4.0	4.3	0.4	3.3	2.1	1.9	2.0
30-34	3.8	1.3	3.2	3.7	--	2.9	4.4	2.0	3.7	1.6	2.0	1.7
35-39	3.4	1.4	2.9	4.7	4.7	4.7	3.4	2.8	3.2	1.6	4.2	2.3
40-44	4.4	10.2	5.7	4.8	3.6	4.5	7.7	6.1	7.2	2.3	0.6	1.8
45-49	8.0	3.2	6.9	1.6	5.1	2.7	6.2	3.9	5.5	4.7	8.4	5.7
50-54	8.6	14.9	9.9	3.6	14.8	5.8	10.5	9.2	10.2	6.8	10.6	7.8
55-59	8.5	36.6	13.8	5.9	21.2	7.5	15.5	26.0	18.2	11.3	22.8	14.3
60-64	27.3	24.5	26.7	19.2	14.9	18.2	25.9	20.8	24.8	20.8	5.5	17.5
65-69	24.4	28.6	25.2	17.1	28.8	19.6	35.1	40.7	36.4	25.3	34.4	27.3
70+	80.7	74.7	79.6	95.0	80.5	92.2	89.0	70.6	86.0	74.7	70.8	91.4
All	10.0	8.9	9.8	11.7	8.7	11.1	8.8	6.6	8.2	7.5	6.1	7.1

Source: Sample Registration System (SRS), Registrar General, India.

Note: '--' Indicates data not available.



Source: Sample Registration System (SRS), Registrar General, India.



Source: Sample Registration System (SRS), Registrar General, India.

The improvement in mortality has also brought to the fore some sharp differences in the sex composition of death in Punjab. It is apparent from Table 5 that at some specified ages the sex of the individual is one of the important indicators of exposure to death. While female mortality-disadvantage is greatly pronounced during childhood and adolescence (0-14 years), male vulnerability begins to be high from the age of 20 and onwards.

Infant, Child and Under-five Mortality

Infant and childhood mortality-reduction goals have continued to be national priority since the First Five Year Plan (Planning Commission 1952), as mortality varies with age and children below five years typically have a relatively higher probability of death in Indian circumstance. The situation in Punjab might compare favourably with the national scene, but the overall economic prosperity of the state is not reflected in trends of infant and child survival (Table 6). In spite of lower incidence of poverty, greater agricultural prosperity, attainment of better living standards and access to basic amenities, elevated urbanization, higher female literacy, greater network of transport, increasing private participation in health care services, and less rural and urban gap in provision of health infrastructure, mortality has continued to be high for infants and children. If development means elimination of preventable deaths for human welfare, then higher mortality trends for the children below five years of age should be a major cause for serious concern in Punjab.

Table 6
Infant Mortality Rate (IMR) by Selected Background Characteristics in Major Indian States

State	IMR (2000)	Percentage of births in medical institutions ² (1998-99)	Percent-age of population poor ³ (2000)	Percent-age of females literate ⁴ (2001)	Percent-age of population living in urban areas ⁵ (2001)	Percent-age of females participating in workforce ⁶ (2001)	Annual rate of growth of GDP in per cent ⁷ (1991-92 to 1997-98)
A. P.	65	49.8	15.8	51.2	27.1	34.9	5.0
Assam	75	17.6	36.1	56.0	12.7	20.8	--
Bihar	62	14.6	42.6	33.6	10.5	18.8	2.7
Gujarat	62	46.3	14.1	58.6	37.4	28.0	9.6
Haryana	67	22.4	8.7	56.3	29.0	27.3	5.0
H. P.	60	28.9	7.6	68.1	9.8	43.7	--
J & K	NA	35.6	3.5	41.8	24.9	22.0	--
Karnataka	57	51.1	20.0	57.5	34.0	31.9	5.3
Kerala	14	93.0	12.7	87.9	26.0	15.3	5.8
M. P.	87	20.1	37.4	50.3	26.7	33.1	6.2
Maharashtra	48	52.6	25.0	67.5	42.4	32.6	8.0
Orissa	95	22.6	47.2	51.0	15.0	24.6	3.3
Punjab	52	37.5	6.2	63.6	34.0	18.7	4.7
Rajasthan	79	21.5	15.3	44.3	23.4	33.5	6.5
Tamil Nadu	51	79.3	21.1	64.6	43.9	31.3	6.2
Uttar Pradesh	83	15.5	31.2	43.0	20.8	16.3	3.6
West Bengal	51	40.1	27.0	60.2	28.0	18.1	6.9
INDIA	68	33.6	26.1	54.2	27.8	25.7	6.9

Source: 1. Sample Registration System (SRS), Registrar General, India.
 2. National Family Health Survey 2 (1998-99), India
 3. Poverty Estimates for 1999-2000, Planning Commission, India.
 4. 5. and 6. Provisional Population Totals, Punjab, Papers 1, 2 and 3, Census of India 2001.
 7. Ahluwalia (2000)

Note: 1. The estimates of poverty (percentage of population below poverty line) are based on a 30-day recall period and the state specific poverty lines of 1999-2000.
 2. -- Indicates data not available.

In spite of a seemingly lower infant mortality rate (IMR) in Punjab than in most of the major states of India, the number of deaths before the first birthday is very high (Table 6). The fact that recent estimates of infant mortality vary somewhat between 52-57 per 1,000 live births, depending on the source (SRS or NFHS), cannot hide the reality that out of total deaths in 1998, the share of infant deaths was 16 per cent in Punjab as against four per cent in Kerala (SRS). Barring Punjab, all the developed states in the Union were able to reduce their infant mortality level substantially between 1981 and 2000. During this period, for instance, the IMR fell by 62 per cent in Kerala, by 47 per cent in Gujarat, by 45 per cent in Tamil Nadu, by 39 per cent in Maharashtra as against only 36 per cent in Punjab (Table 8). Mortality among infants has not been showing signs of real decline since the early nineties, as indicated by the time-trend (Table 7). Reasons for this merit some investigation, in the context of the link between overall economic deceleration in Punjab as reported recently and living standards of households, particularly in the rural sector (Table 6).

For greater success in infant mortality reduction in Punjab, there is need to concentrate on rural areas, where two-thirds of the total population reside. The major States (Kerala, Maharashtra, Tamil Nadu and West Bengal), with mortality among infants before first birthday lower than in Punjab, are those, which were able to reduce infant mortality

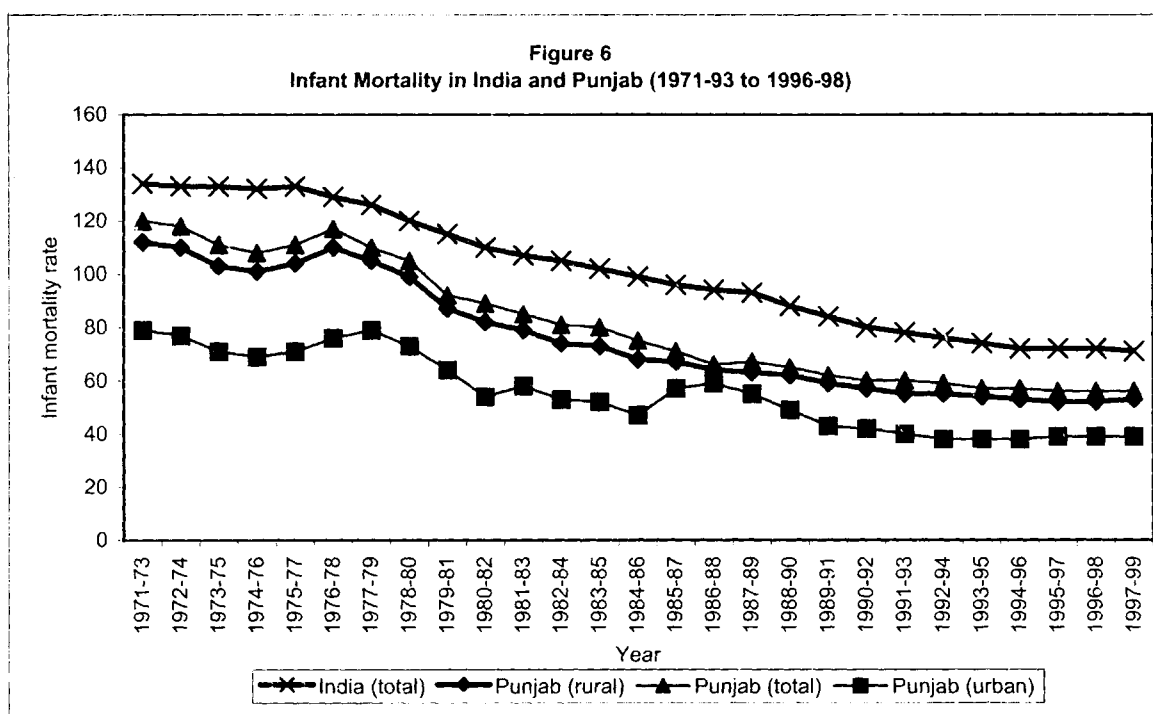
progressively by focusing consistently on rural areas. For instance, decline in rural infant mortality in Kerala (51%), Maharashtra (24%), Tamil Nadu (35%) and West Bengal (30%), during 1986-88 and 2000, far exceeded the decline in Punjab (15%). The fact that rural areas in Punjab require urgent attention in this regard is clear from the latest early-life NFHS mortality statistics. Neo-natal, post-neonatal infant, child and under-five mortality rates are shown as, 69 per cent, 42 per cent, 58 per cent, 96 per cent, and 64 per cent higher respectively in villages than in cities and towns. Lack of rural bias is perhaps one of the reasons why Punjab has had a much slower decline in mortality during one and half decades of the last century, as indicated by the percentage change in the IMR. Any innovative programme-formulation and management must recognize this rural-urban dichotomy.

Table 7
Levels, Trends and Sex Composition
in IMR in India and Punjab (1971-73 to 1998-2000)

Year	Levels and trends in infant mortality				Gender disparity (f/m) in infant mortality [@]	
	India	Punjab			India	Punjab
	Total	Total	Rural	Urban		
1971-73	134	112	120	79	1.05	1.16
1972-74	133	110	118	77	--	--
1973-75	133	103	111	71	--	--
1974-76	132	101	108	69	--	--
1975-77	133	104	111	71	--	--
1976-78	129	110	117	76	1.07	1.10
1977-79	126	105	110	79	1.05	--
1978-80	120	99	105	73	1.03	--
1979-81	115	87	92	64	1.01	--
1980-82	110	82	89	54	1.00	--
1981-83	107	79	85	58	0.99	--
1982-84	105	74	81	53	0.99	0.98
1983-85	102	73	80	52	1.01	1.05
1984-86	99	68	75	47	1.01	1.12
1985-87	96	67	71	57	1.01	1.15
1986-88	94	64	66	59	1.00	1.15
1987-89	93	63	67	55	0.99	0.99
1988-90	88	62	65	49	1.00	1.06
1989-91	84	59	62	43	1.00	0.99
1990-92	80	57	60	42	1.01	1.13
1991-93	78	55	60	40	1.01	1.09
1992-94	76	55	59	38	1.00	1.21
1993-95	74	54	57	38	1.01	1.27
1994-96	72	53	57	38	1.01	1.25
1995-97	72	52	56	39	1.03	1.20
1996-98	72	52	56	39	1.03	1.13
1997-99	71	53	56	39	1.03	1.09
1998-2000	70	53	57	39	--	--

Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

Note: '--' Indicates data not available and '@' based on sex specific moving averages.



Source: Sample Registration System (SRS), Registrar General, India. Various volumes.

The timing of infant death has also far-reaching importance for framing measures that enhance the survival chances of the newborns. Since biological factors are largely decisive in determining chances of survival in the neo-natal period, and environmental and behavioral factors in the post neo-natal period, classification of deaths into such categories also help in understanding their pattern during infancy.

Mortality, at all stages, has declined considerably in Punjab since the early eighties, as in other major states (Table 8). In spite of social, economic and cultural constraints, many states have performed better than Punjab in reducing childhood mortality. For instance, Tamil Nadu and Kerala have been able to reduce mortality among children below five years of age by nearly three-fifths and West Bengal by two-fifths, as against only 23 per cent in Punjab. Such states like Kerala, Tamil Nadu, West Bengal and Maharashtra were also able to lessen substantially the neo-natal, post neo-natal, infant and child deaths. This needs to be emulated in Punjab, which has substantial loss of lives during childhood (0-4 years); 20 per cent of total deaths occur in childhood in Punjab as against five per cent in Kerala, 14 per cent in Tamil Nadu and 18 per cent in Maharashtra. This indicates that with the right kind of intervention, the scope to reduce childhood mortality is immense in Punjab.

Gender Bias in Infant and Child Mortality

Sharp sex-differentials characterize infant and childhood mortality in Punjab. Data from both the SRS and NFHS show comparatively high female mortality in Punjab than in other states of India. In view of considerable gains to both sexes from the onset of mortality decline during last three decades, such male-female divergence is possible, in theory, when female children benefit either equally or less in relation to male children. In

spite of improvements in literacy, expansions in outreach of health-care services and rise in overall living standards in recent times, the sex composition of infant mortality trends in Punjab indicate that greater vulnerability of the girl child has remained virtually unchanged in the long run (Table 9 and Figure 7). On the contrary, more recent data reveal intensification of gender disparity in mortality in Punjab at every stage of childhood, particularly before the fifth birthday (Table 9). Rise in female disadvantage in mortality between 1992-93 and 1998-99 is a worrisome sign, implies preponderance of social, cultural and economic rather than health and medical factors, and reinforces the need for corrective measures.

Table 8
Changing Mortality at Different Stages of Childhood in India and Major States

State	Neo-natal mortality rate			Post neo-natal mortality rate			Infant mortality rate			Child mortality		
	1981	1998	Percent decline during 1981-98	1981	1998	Percent decline during 1981-98	1981	2000	Percent decline during 1981-2000	1981	1998	Percent decline during 1981-91
A P.	60	46	23.3	26	21	19.2	86	65	24.4	30	20	33.3
Assam	67	51	23.9	39	25	35.9	106	75	29.2	40	32	20.0
Bihar	74	44	40.5	44	37	15.9	118	62	47.5	43	33	23.3
Gujarat	75	44	41.3	41	21	48.8	116	62	46.6	41	27	34.1
Haryana	58	41	29.3	44	29	34.1	101	67	33.7	37	33	10.8
H. P.	15	50	-233.3	57	18	68.4	71	60	15.5	19	22	-15.8
J & K	44	--	--	28	--	--	72	50	30.6	26	--	--
Karnataka	49	42	14.3	21	17	19.0	69	57	17.4	24	21	12.5
Kerala	26	11	57.7	12	5	58.3	37	14	62.2	12	5	58.3
M. P.	81	61	24.7	62	37	40.3	142	88	38.0	61	37	39.3
Maharashtra	54	29	46.3	25	19	24.0	79	48	39.2	26	18	30.8
Orissa	80	60	25.0	55	37	32.7	135	96	28.9	42	29	31.0
Punjab	49	33	32.7	32	22	31.3	81	52	35.8	26	20	23.1
Rajasthan	60	50	16.7	49	33	32.7	108	79	26.9	50	40	20.0
Tamil Nadu	63	35	44.4	29	18	37.9	91	51	44.0	35	14	60.0
U. P.	96	52	45.8	54	33	38.9	150	83	44.7	60	38	36.7
West Bengal	64	30	53.1	27	23	14.8	91	51	44.0	34	20	41.2
INDIA	70	45	35.7	41	27	34.1	110	68	38.2	41	29	29.3

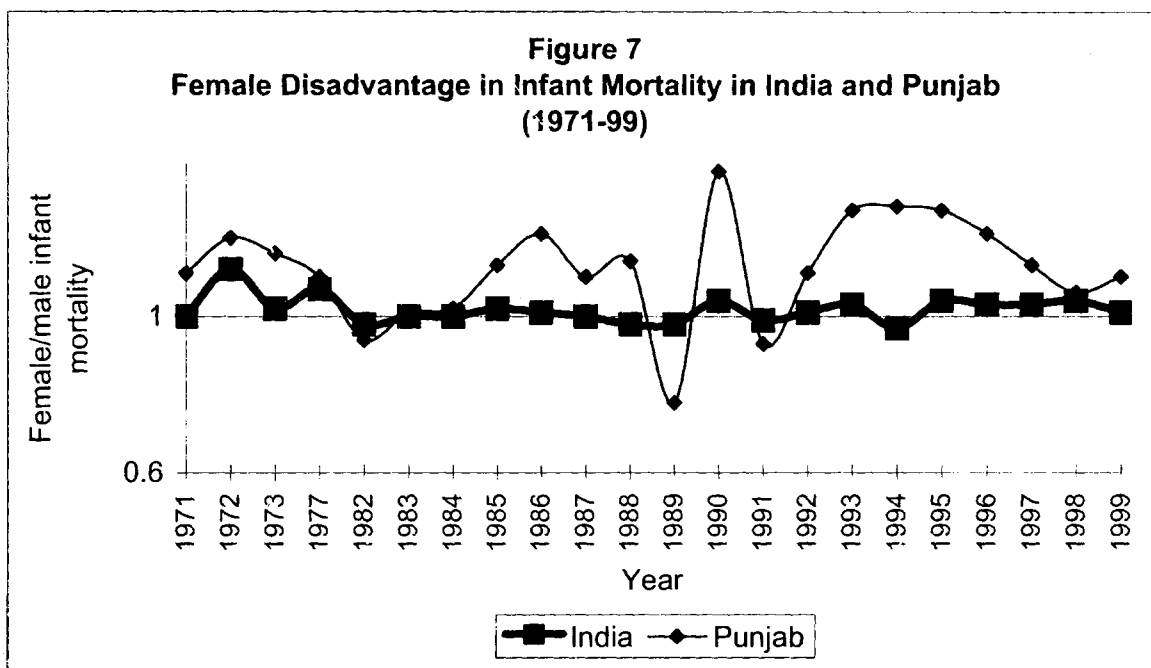
Source: Sample Registration System (SRS), Registrar General, India.

Note: '--' Indicates data not available.

Table 9
Levels and Trends in Neo-natal, Post neo-natal, Infant, Child and Under-five Mortality by Sex Differentials in India and Punjab (1992-93 to 1998-99)

State	Type of mortality									
	Neo-natal mortality		Post neo-natal mortality		Infant mortality		Child mortality		Under-five mortality	
	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99
Punjab										
Male	32.9	34.4	22.8	15.3	55.6	49.7	12.7	5.9	67.6	55.4
Female	27.0	37.9	22.1	27.3	49.1	65.2	23.0	23.8	71.0	87.4
Female disadvantage (f/m)	0.8	1.1	1.0	1.8	0.9	1.3	1.8	4.0	1.1	1.6
INDIA										
Male	57.0	50.7	31.7	24.2	88.6	74.8	29.4	24.9	115.4	97.9
Female	48.1	44.6	35.8	26.6	83.9	71.1	42.0	36.7	122.4	105.2
Female disadvantage (f/m)	0.8	0.9	1.1	1.1	0.9	1.0	1.4	1.5	1.1	1.1

Source: National Family Health Survey (1992-93 and 1998-99), India.



Source: Sample Registration System (SRS), Registrar General, India. Various Volumes.

Causes of Death in Infancy and Childhood

Though reliable data on direct causes of death are vital for its assessment in early childhood, such information is rarely available in a format that can be useful for initiating health-assessment and intervention programmes. However, data from *Survey of Causes of Death in Rural Areas* (Registrar General, India) fill the gaps in mortality statistics to some extent and identify the top killer diseases during infancy and childhood. For example, for infants dying before first birthday in rural Punjab in 1998, the causes were premature birth (25%), pneumonia (25%), anaemia (10%), respiratory infections (6%), diarrhoea (6%), congenital malformations (4%) and birth injury (1%). Similarly, major causes of rural-child deaths in Punjab in 1998 were pneumonia, diarrhoea and gastroenteritis, and malaria, which together accounted for 60 per cent of deaths in the 1-4 years age group (Registrar General, India).

Investigation of circumstances that create an environment for higher levels of infant and child mortality in general, and excess female mortality in particular, leads one to a set of factors that are deeply embedded in the socio-economic position of the households. For instance, studies on Punjab have indicated that place of residence, education and work-status of mother, caste affiliation, standard of living and pattern of differential care based on the sex of the child in households, extensively affect the chances of survival of children below five years of age at various stages (Das Gupta 1987, Krishnaji 2002). Demographic determinants, such as order of birth, sex of the child, mother's age at birth, length of the previous birth interval, etc., are also found to be crucial in the levels of neonatal, post neo-natal, infant, child and under-five mortality (NFHS 1995 and 2001). Studies are required to ascertain the role of a dominant backward population, gender preference, access to and utilization of health-care services particularly during pre-natal, natal and post-natal periods slowing down of economic growth and impact of the current structural adjustment programme on recent trends in infant and childhood mortality in the state.

Further reduction in mortality, due to the above causes, will certainly depend not only on the state of public health programmes in Punjab, but also on overall levels of economic and social development in terms of health, hygiene, environmental sanitation, levels of living, financial capacity to pay for health care and socio-cultural barriers in accessing it. The enormity of the tasks ahead, in relation to infant mortality, can well be visualized from the fact that Punjab has to go a long way, in order to conform to the national goal of bringing down the IMR to 45 by 2007, 30 by 2010, and 28 by 2012, as laid down in the National Population Policy (2000) and the Tenth Five Year Plan (2002-2007). This appears difficult to achieve, as for some time in the recent past, the infant mortality level has been stagnating in the state, with the rates hovering around 53 per 1,000, and not falling as normally expected.

Ways to fight infant mortality would include removal of gender bias, strengthening of the Child Survival and Safe Motherhood (CSSM) Programmes under the RCH umbrella, screening mothers-to-be for ante-natal check-up and nutritional intake, reduction in the share of non-institutional births, adequate provision for emergency obstetrics services, introduction of nutritional programmes especially for anaemic mothers, proper immunization, baby-friendly infant-feeding practices and nourishment for the newborn, strengthening the sub-centres, subsidiary health centres and primary health centres, and making women doctors available for female clients, particularly at selected centres in remote rural areas, and wider community involvement.

Maternal Mortality

Maternal mortality ratio (MMR), as an important indicator of socio-economic development, women's empowerment and access to basic health care, has been recognized by the planning process from the First Five Year Plan (1951-56) onwards (Planning Commission 1952). Yet, in India, more than 1,00,000 women die every year from causes connected with pregnancy, childbirth and related complications (NFHS 2000). This has strong implications for infant survival, family ties and generational well-being, as these deaths not only devastate the families concerned but also lead to unfavourable social and economic relations between generations. Even if, in India, maternal deaths are substantial, precise data on these are rare at the state level. One of the different ways of improving assessment of maternal mortality is to upgrade the data on such deaths through advances in the vital registration system, reporting the exact cause of death, and inclusion of some basic background characteristics of the deceased.

Lack of studies on maternal mortality, particularly in Punjab, hamper efforts to address the problem. Though the SRS provided the MMR for Punjab for the first time in 1998, the rate is far from the reality, as it is based on information collected through the post-death verbal-autopsy method for a small sample of deaths (eight). An MMR of 199 for Punjab as against the national average of 407 seems to be a gross underestimate. Even if the SRS-based MMR is considered correct, it is still far from the National Socio-Demographic Goal for 2010, which aims to bring the MMR below 100 per 1,00,000 live births, as enunciated in the National Population Policy 2000 (NPP 2000). Maternal deaths according to the SRS are due to direct causes, consisting of haemorrhage (88%) and complications predominantly related to puerperium (12%).

According to some hospital- and community-based studies, variations in maternal mortality can be directly related to rural and urban residence, availability and use of health infrastructure for ante-natal, natal and post-natal requirements, conditions of

Levels and Trends in Use

The use of contraceptives among Indian couples shot up to a reasonable level in a brief period from virtually no practice at the time of independence. Notwithstanding policy rigidities, socio-cultural barriers, programme deficiencies, etc., contraception today is at the core of the demographic changes that are widely sought, both officially and privately. Discounting the riddles that official service statistics present, some states have done less better than others in programme performance, and hence have contributed to regional disparity in the use of family planning methods.

In the north, apart from Himachal Pradesh (61%), Punjab is widely recognized for its good performance in implementing the family planning programme, like Maharashtra (60%) and Gujarat (53%) in the west and Andhra Pradesh (59%), Karnataka (57%), Kerala (56%), and Tamil Nadu (50%) in the south, according to the recent NFHS. Since the inception of the programme, the contraceptive prevalence rate (CPR) has consistently remained higher in Punjab than the national average, notwithstanding the controversies that had dogged the programme, till recently. Apart from awareness, the growth in CPR in the state can be attributed to vigorous programme implementation strategies, mainly tagged to incentives and disincentives to programme-staff and clients. Both official service statistics and independent contraceptive prevalence surveys have consistently established the edge of Punjab over others in making contraception reach the population widely (Table 10, Figure 8). In addition to a real difference in use of methods, the differences between official and non-official figures can also be attributed to methodological differences in the estimation.

Table 10
Levels and Trends in Current Contraceptive Prevalence Rate (CPR) due to All Modern Methods in India and Punjab (1973-99)

Year	MOHFW		NSS/ NFHS/ ORG		Levels and trends in method composition							
	India	Punjab	India	Punjab	Sterilization		IUD		Condom		Oral pill	
					India	Punjab	India	Punjab	India	Punjab	India	Punjab
1973	15.0	24.8	12.2	21.8 [@]	11.3	11.5	1.4	6.0	2.3*	7.3*	--	--
1975	16.3	24.6	--	--	12.4	12.8	1.4	5.1	2.5*	6.8*	--	--
1976	18.9	29.1	--	--	14.1	14.2	1.5	5.2	3.4*	9.7*	--	--
1977	26.1	36.0	--	--	21.1	20.5	1.6	5.6	3.5*	9.8*	--	--
1978	24.4	33.1	--	--	20.4	20.3	0.9	3.5	3.0*	9.3*	--	--
1979	24.4	28.9	--	--	20.2	19.8	1.0	3.3	3.3*	5.9*	--	--
1980	23.9	27.6	--	--	20.2	19.4	1.1	3.3	2.7*	4.9*	--	--
1981	24.3	27.4	--	--	20.0	19.2	1.1	3.6	3.2*	4.6*	--	--
1982	25.6	30.2	--	--	20.7	20.6	1.2	4.4	3.8*	5.1*	--	--
1983	28.4	37.7	--	--	22.0	24.0	1.4	7.9	4.9*	5.8*	--	--
1984	32.4	48.0	--	--	23.7	27.5	2.3	11.1	6.2*	9.4*	--	--
1985	35.8	57.4	--	--	25.0	29.9	3.0	14.3	7.8*	13.1*	--	--
1986	38.7	60.6	--	--	26.5	31.2	3.9	15.8	8.3*	13.6*	--	--
1987	46.7	72.0	--	--	27.9	33.9	4.8	18.9	7.4	17.2	1.3	1.9
1988	44.2	78.3	39.9	65.9 [#]	28.9	36.6	5.5	21.8	8.3	18.0	1.5	1.9
1989	46.7	79.9	--	--	29.8	37.2	6.2	22.4	8.9	18.4	1.7	1.9
1990	48.6	85.5	--	--	30.1	39.3	6.6	23.9	10.0	20.2	1.9	2.1
1991	49.6	85.4	--	--	30.3	41.1	7.0	25.5	10.1	16.6	2.1	2.1
1992	48.6	83.8	--	--	30.3	38.3	6.6	25.3	9.4	17.8	2.2	2.4
1993	48.7	80.2	36.3	51.3 [#]	30.3	37.9	6.6	24.3	9.9	16.1	2.0	1.9
1994	51.3	89.8	--	--	30.3	38.5	7.2	26.3	11.2	22.1	2.7	2.9
1995	51.6	90.8	--	--	30.2	38.9	7.6	28.1	10.8	20.6	3.0	3.3
1996	52.2	91.9	--	--	30.2	38.8	8.2	31.4	10.7	18.3	3.2	3.4
1997	51.0	86.6	--	--	29.6	38.5	7.8	28.8	10.4	16.5	3.1	2.9
1998	50.8	77.5	--	--	29.3	35.5	7.6	24.7	10.1	14.7	3.8	2.7
1999	--	--	42.8	53.8 ^{\$}	--	--	--	--	--	--	--	--

Source: 1. Ministry of Health and Family Welfare, Government of India, *Year Books*. Various volumes.

2. @: *National Sample Survey (NSS)*, 28th Round, 1978.

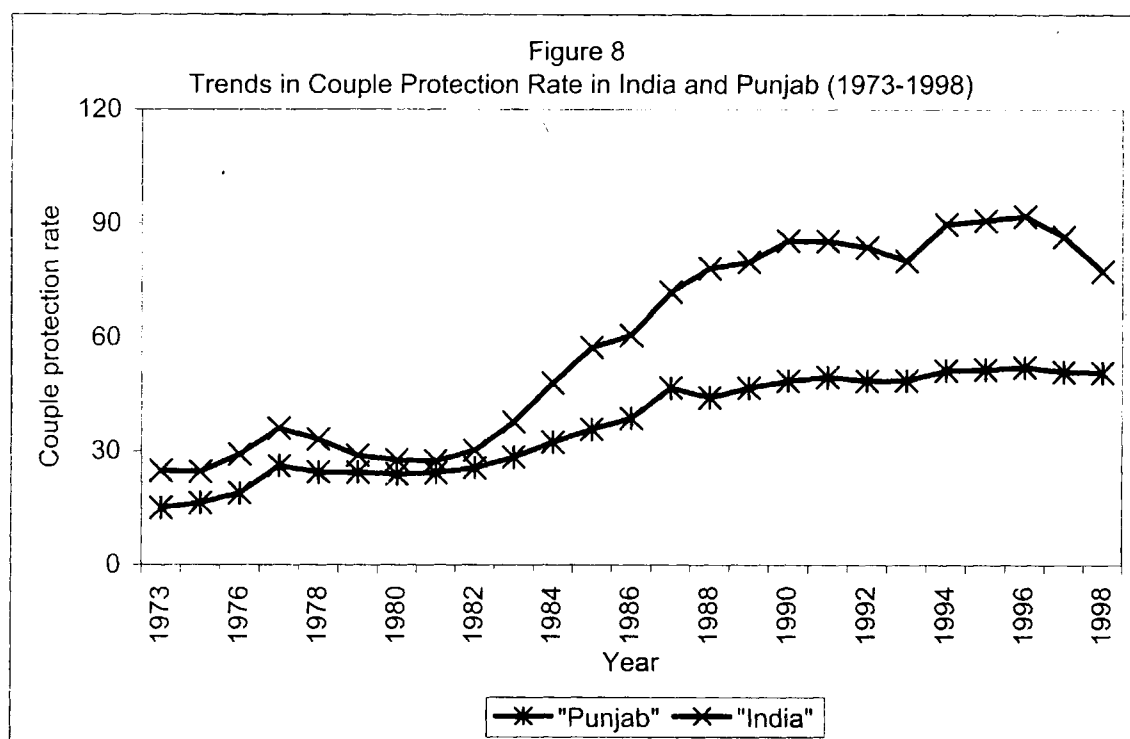
3. #: *Operations Research Survey III* (1988-89), Operations Research Group (ORG), Baroda.

4. \$: *National Family Health Survey (NFHS)*, India, 1992-93 and 1998-99.

Note: 1. "*" Includes use of oral pills also.

2. "--" Indicates data not available.

3. Figures are in percentages.



Source: Ministry of Health and Family Welfare, Government of India, *Year Books*. Various volumes.

Method Mix

The three decades of the seventies, eighties and nineties, while recording an impressive rise in contraception prevalence, also witnessed significant changes in method-preference of the couples in Punjab (Figures 9 and 10). Among modern methods, the terminal ones, such as sterilization and spacing methods like the IUD continued to dominate the range of contraceptives offered by the state and registered remarkable growth in acceptance among the couples (Table 10). Comparison of results from two successive rounds of NFHS also point towards a transition in contraception-prevalence in the state in terms of method-mix and preferences, with direct implications for policy planning besides programme implementation. Rapid rise in the share of traditional methods, growth in the popularity of condoms, stagnation in the acceptance of IUD, and reduction in the traditional dominance of sterilization are some of the salient features of this transition. Already, low share of male sterilization in total sterilization has further declined from eight per cent in 1992-93 to five per cent in 1998-99, indicating continuity in male lack of enthusiasm for adoption of terminal methods. Traditional methods are more popular among older than younger women.

state can currently focus more on women in rural areas, Muslims women, women in the age group 20-29 and those with one child, in order to enhance couple-protection rates. While such target groups express the desire to delay child-bearing through family planning methods, older women, higher parity women, Hindu women and Sikh women are more for termination of child-bearing through contraception. If the family planning programme in the state is to be more result-oriented, then innovative strategies must be put in place to bring in these interested sections of the community. Existence of unmet need also reinforces the argument that fertility in Punjab can be lowered further without any coercive measures to limit the family size.

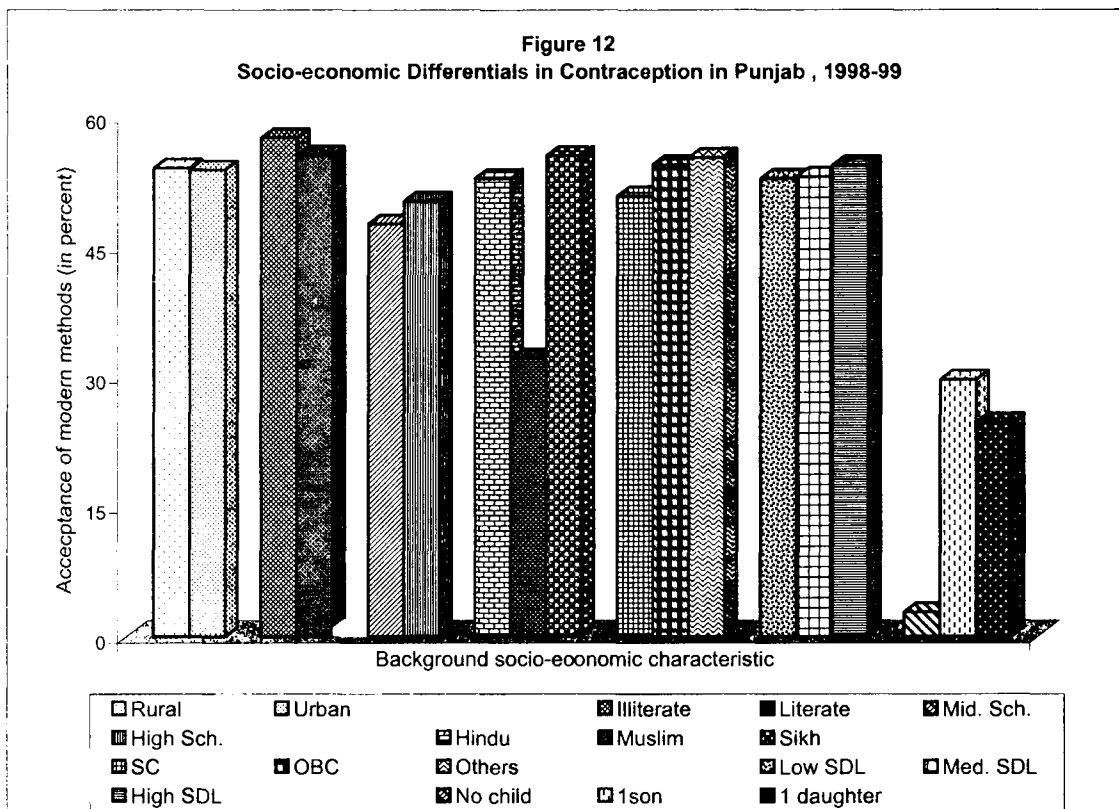
While a lower volume of unmet need for contraception reflects the potential for family planning programme in the state, both by the government and the non-government sector, very high met need for contraception in Punjab, even higher than in Kerala, may not entirely reveal the real scope for intervention. This is so because the definition of unmet need is subjective, grounded on the perception of the individual woman, which could underestimate the actual need for family limitation in dynamic and macro perspectives.

Non-use and Discontinuation

Unmet need for contraception can be better understood, if the reasons for non-use as well as discontinuation of contraception are investigated. The main reasons why couples refrain from currently using contraception in Punjab are the desire for additional children (42%), postpartum amenorrhoea and breast-feeding (32%), menopause and hysterectomy (12%) and health concerns (5%), as suggested by NFHS. Hence, increasing contraception-prevalence rate substantially in Punjab in the near future does not seem easy, without confronting pro-natal norms, particularly son preference, and addressing health concerns including possible side effects. Towns and cities in the state are virtually free from any opposition to family planning methods, reluctance to use them because of side effects and method inconvenience when compared to villages. Avenues for direct action by the state for removing bottlenecks is limited, as, over time, opposition to contraception (by religion, family and husband) and method-inconvenience are on the decline in recent times, as indicated by NFHS. Discontinuation of the used method also throws insight into programme dynamics, and rural as well as urban areas record similar patterns of discontinuation in Punjab. Couples mostly discontinue family planning when they want to have a child (19%) or when the husband is away (16%), though side effect is also a significant factor.

Social, Economic and Demographic Differentials

Socio-economic differentials in family planning practice are distinct in Punjab, as evident from NFHS. Acceptance of traditional methods of family planning, surprisingly, is much higher in urban than in rural areas, whereas in modern methods there is little gap in rural and urban use. While female sterilization is the most popular modern method in rural areas (with 64% of couples using them), in urban areas the condom is used extensively (by 33% of couples). Couple-protection rate through use of modern methods is lowest among Muslim women (32%) and women with middle school education (48%). Women from Scheduled Castes, Other Backward Castes, and households with low standard of living have also been observed to use contraception to a lesser degree than other women in the state.



Source: National Family Health Survey 2.

The family planning programme in Punjab is also influenced by son-preference, as opting for contraception or not by couples depends to a large extent not only on the total number of living children but also on the number of living son(s). As NFHS indicates, a strong correlation also exists between the sex composition of surviving children and methods adopted for family planning (Table 11). Comparison between spacing and terminal methods shows that the acceptance of terminal methods by couples are largely dependent on the needed number of male children in the family. Even such methods as condom and IUD, which often do not finally terminate child-bearing, are used by couples after meeting the targets of family-size in terms of the required number of sons. If the family planning programme in the state has to make further inroads and be sustainable, it must address and confront the gender dimensions.

Both the panels in Table 11 suggest that the 'Two Child Norm' is strongly rooted in the fertility planning of the couples and determines the choice method in Punjab. The idea, highly ingrained in the minds of couples that contraceptives are only meant for use after the birth of at least one child, needs to be changed. It also confirms that there exists vast scope in the state for increased family planning practices among couples. At least, spacing methods, such as the IUD and condom, can be more vigorously promoted in the state, particularly among women with no child, one child and two children. If method-specific concerns are dealt with properly, the pill could also be reasonably promoted among women. This perhaps will have a direct impact on the level of unmet need that has been earlier recorded in the state.

being increasingly so in the recent past? There is little evidence, till now, in contemporary demographic literature that suggests a strong deviation in the sex composition of births from the biologically established 'norm' of 105-106 males per 100 females in Punjab. Analysis of historical sex ratios at birth for Punjab, though not conclusive, implies no reason why a surplus of male births was prevalent in colonial Punjab, as some would suggest. Annual fluctuations, coverage-error, recall lapse and classification of births either into live or still, etc., cannot justify the rise of the magnitude of sex ratio at birth (SRB) that is being witnessed since the early 1980s. The cause of this unusual increase in the surplus of male babies at the time of birth can less likely be described in terms of any biological or medical perspective, that would answer why women in Punjab have the higher probability of giving birth to male offspring(s) than their counterparts elsewhere in India.

Table 13
Levels and Trends in Sex Ratio at Birth (SRB) in India and Punjab (1972-81 to 1999)

State	Sample Registration System (SRS)		National Family Health Survey (NFHS)			Civil Registration System (CRS)				
	1981	1996	1972	1982	1993-97	1995	1996	1997	1998	1999
	-	-	-	-						
	90	98	81	91						
Punjab	113	123	106	118	114	129	132	133	126	128
India	110	111	107	106	107	--	--	--	--	--

Source: 1. *Sample Registration System (SRS)*, Registrar General, India.
2. *National Family Health Survey (NFHS) 1992-93: India and different states.*
3. *National Family Health Survey (NFHS 2) 1998-99: India and different states.*

Note: 1. Sex ratio at birth (SRB) is defined as number of males per 100 females.
2. '--' indicates data not available.

The SRB is a direct manifestation of sex ratio at the time of conception. If social, cultural, environmental and biological factors that selectively affect the conception and carriage of female foetus to full term are absent, then higher than a 'normal' SRB is less probable. Being 'secondary' in nature, SRB is greatly affected by what happens to the 'primary' sex ratio (the ratio of conception) and to pregnancies. With medical evidence that endogenous factors are more hostile to the survival of male babies, not only in pregnancy but also during four weeks after birth, one expects the male (numerical) advantage at the time of conception to prevail, but at a lesser level, conforming to the 'normal' SRB. But the fact that in Punjab the male advantage is more than 'normal' at the time of birth, gives currency to the argument that a significant share of females are lost either at the time of conception or during pregnancy. Widely available sex-selection technologies, at affordable prices, till recently with little social or legal hurdles, seem to have made intervention possible for couples, either at conception or during early pregnancy.

Another route by which SRB affects child sex ratio is through its extended impact on the order of birth. In the absence of any intervention, biological or behavioural, in the process of conception and pregnancy, the sex ratio at the time of birth tends to be less masculine, or at least remains constant with the rise in the order of birth, as the later-borns are more likely to be girls than boys (Klassen 1994). Hence, it may be assumed that in high-fertility populations, more births per woman means a natural cushion against masculinity. With fertility transition under way, higher order births are being stopped

faster in Punjab than in India as a whole, leading to the preponderance of the first- and second-order births, as seen in NFHS. So, on the basis of this biological lead, one would have expected that the fertility decline in these two populations might have had a natural and independent diminution effect on the femininity of the child population, depending on its frequency. It is necessary to verify this possible effect.

Higher Female Childhood Mortality

In addition to the sex ratio at birth, the other distortion in child sex ratio comes from excess female child mortality (discussed earlier in detail). Though young-age children from both the sexes have gained in chances of survival, especially during the past two decades, improvements in mortality conditions have not been able to wipe out the excess female disadvantage that has long characterized mortality in Punjab. The persistent higher death rate for the girl child, relative to the opposite sex, highlights the setback that young female members of households have to face. Shortages of females, at birth and at early age, create numerical disparity in the childhood for each cohort, difficult to alter subsequently.

Sex Preference

Changes in sex ratio are linked to the overall preference for the male child in Punjab. Strong male dominance in mediaeval history, extending up to the modern period, has characterized the state. Regular invasions from across the border, male-oriented agricultural system, presence of sizeable sections of lower-caste population, focus on male-centric rituals and kinship systems, absence of strong social reform movements, etc., have contributed to higher value of the male child in traditional Punjabi society. In modern Punjab, in spite of the rise in female education and legal support, there are many reasons, in popular perception, for not having a female child. Here, the position of the daughter-in-law in the family is defined, on her arrival, to the culturally-sanctioned urgency of producing a child, preferably a son.

In spite of economic progress, institutional arrangements, constitutional support and educational campaigns, preference for a male child among the couples still persists extensively in Punjab. As indicated by two sets of NFHS, for couples in the state, in 1999, the mean ideal number of children, on an average, was 2.3, which consisted of 1.2 sons, 0.8 daughters and 0.3 children of either sex. In 1993, the mean ideal number was 2.6 with 1.5 sons, 0.9 daughters and 0.2 children of either sex. The fact that among ever-married women in 1999, 86.2 per cent of the couples wanted at least a son and 78.0 per cent at least a daughter, 29.1 per cent wanted more sons than daughters and 0.4 per cent more daughters than the sons, highlights how the desire for a male child is endemic in Punjab.

Sex-Selective Abortions

Desire for a male child being strong and the sex ratio at birth increasingly turning masculine in Punjab, it is likely that a sizeable share of female foetuses are terminated during pregnancy. Data on the nature and scale of abortions in Punjab, as revealed by recent surveys, do not indicate such a scale of pregnancy terminations as to result in a highly masculine sex ratio at birth. Recent large-scale surveys data are silent on the sex composition of induced abortions, though they establish a somewhat higher incidence of such abortions in Punjab than the national average. Direct data too suggest acceleration

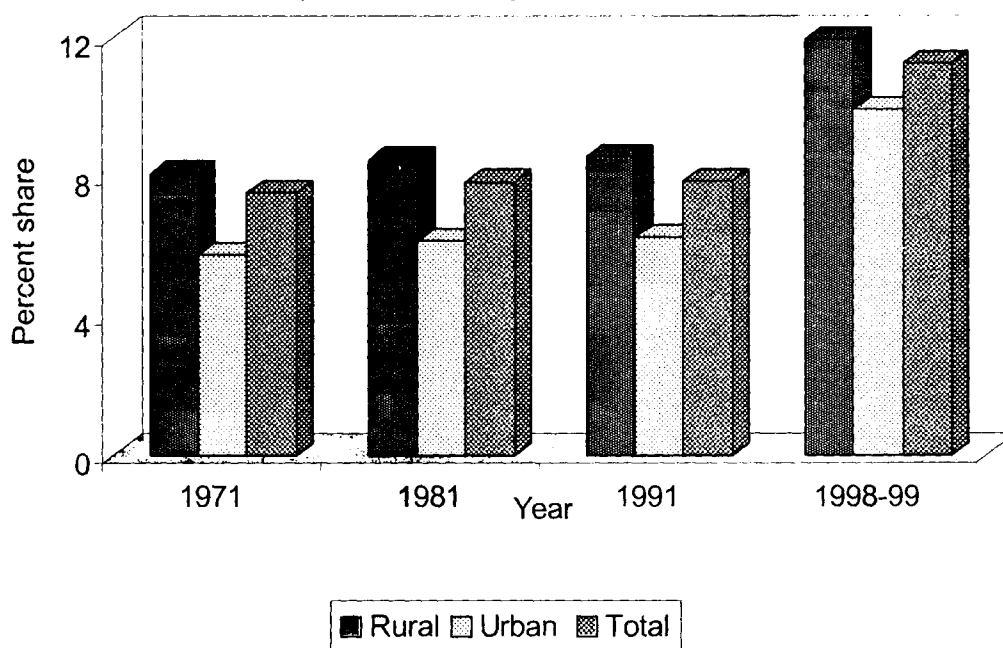
With gains in average life expectancy being substantial in the state as observed, survival to a higher age is increasing and causing a continuous rise in numbers and percentages of persons aged 60 and above in both rural and urban areas (Table 16, Figures 5 and 6). Rise in the share of male and female elderly in Punjab, when considered in the national context, is on the higher side. In 20 years, the old age population has increased by 57 per cent in the state from 1.01 million in 1971 to 1.59 million in 1991.

Table 16
Trends in the Percent Share of Persons 60 and above in Rural and Urban Areas in India and Punjab (1971 to 1998-99)

Year	Punjab			India		
	Rural	Urban	Total	Rural	Urban	Total
1971	8.03	5.72	7.48	6.21	4.98	5.97
1981	8.44	6.12	7.80	6.84	5.36	6.49
1991	8.51	6.25	7.84	7.11	5.75	6.70
1998-99	11.90	9.90	11.20	8.10	7.30	7.90*

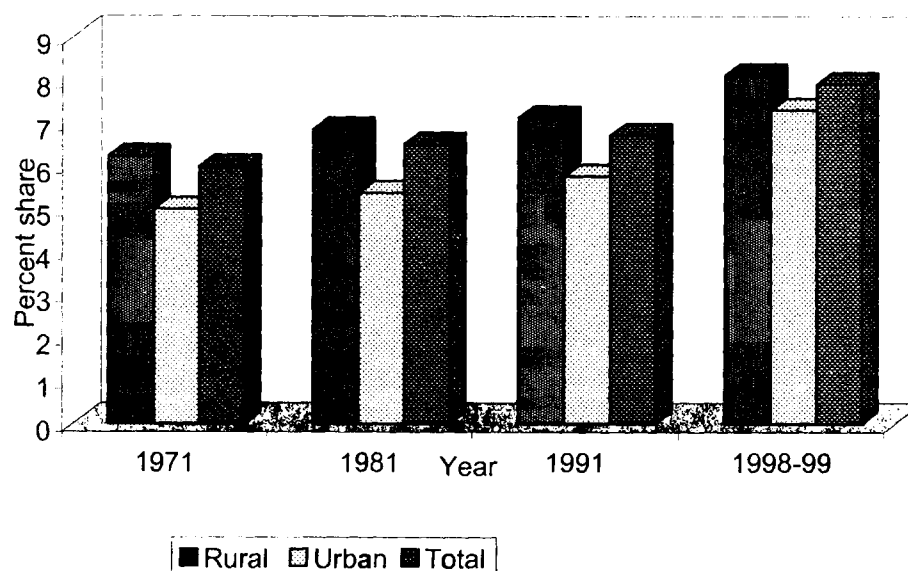
Source: 1. *Ageing Population of India: An Analysis of 1991 Census Data*, Registrar General, India.
 2. ** *National Family Health Survey 2: India and Punjab*.

Figure 13
Share of the Aged in Total Population in Punjab (1971-99*)



Source: 1. *Ageing Population of India: An Analysis of 1991 Census Data*, Registrar General, India.
 2. ** *National Family Health Survey 2: India and Punjab*.

Figure 14
Share of the Aged in Total Population in India (1971-99)



- Source:** 1. *Ageing Population of India: An Analysis of 1991 Census Data*, Registrar General, India.
 2. *National Family Health Survey 2: India and Punjab*.

In 20 years since 1971, the average annual growth rate, among the elderly in Punjab, has changed considerably in terms of both sex and age. Growth in the population of elderly women not only surpassed that of the elderly male but also of the female population of all ages (Table 17). Among both male and female elderly population, growth rates of the 'young-old' population (aged 60-79) exceeded those of the 'old-old' (aged 80 and above).

Table 17
Average Annual Growth Rate of Aged Population in India and Punjab (1971-91)

Age (in completed years)	Punjab		India	
	Male	Female	Male	Female
60+	2.28	3.65	3.70	3.63
All ages	2.42	2.56	2.73	2.70
60-69	2.23	3.75	3.27	3.40
70-79	2.57	3.97	4.12	3.97
80-89	2.04	3.03	5.93	4.54
90-99	1.89	3.07	5.39	4.16
100+	0.12	-1.09	1.25	0.47

Source: *Ageing Population of India: An Analysis of 1991 Census Data*, Registrar General, India.

Note: Figures are in per cent.

Implications of Ageing and Need for Suitable Measures

Rise in the proportion of the elderly in the scale observed and expected in Punjab, has multifaceted consequences that need to be addressed seriously. These broadly relate to continuous social, economic, cultural, technological, and health transformations in the society. Specifically, these implications can be elaborated as changes in marital status, newer living arrangements, widespread age and gender discrimination, ongoing epidemiological transition, frequent loneliness and depression, impairment of functional status leading to disability, lowering of socio-economic status, decline in family support, non-availability of social security, lack of care-giving, vulnerability to natural disasters, etc. Unfortunately, for the population in Punjab, not much is known of these aspects and there is need for more research and documentation in these areas for effective intervention.

While dealing with ageing in Punjab, lessons have to be drawn from other ageing societies, so that the mistakes of treating the problem primarily as an issue of health care and economic empowerment, must not be repeated in policy planning for the elderly. In addition to these two aspects, the social and emotional dimension of ageing must be addressed, if its onslaught is to be effectively dealt with. Foundations for a new philosophy of ageing are essential for a regime of 'productive ageing' where older persons are active contributors rather than mere consumers.

At the national level, the National Policy on Older Persons (NPOP), announced in 1999, recommends a series of steps that help to deal with issues related to ageing. In Punjab, there is need to assess the progress that has been made till date, under NPOP, to encourage individuals to make provision for their own as well as their spouse's old age, and other old family members; ensure primacy of non-institutional care, added protection for vulnerable elderly such as widows, frail, handicapped, abused and destitute, promotion of geriatric health care and services, monitoring, evaluation and up-gradation of services for the elderly, fostering of inter-sectoral partnership and spread of awareness for the elderly. Involvement of the district administration, local self-government, NGOs and *Panchayati Raj* institutions and self-help groups in devising integrated programmes, also need to be examined along with progress in the establishment of old age homes. Such an evaluation will make the initiatives and measures more meaningful and relevant to the needs and welfare of the aged.

REGIONAL DEMOGRAPHIC DISPARITY

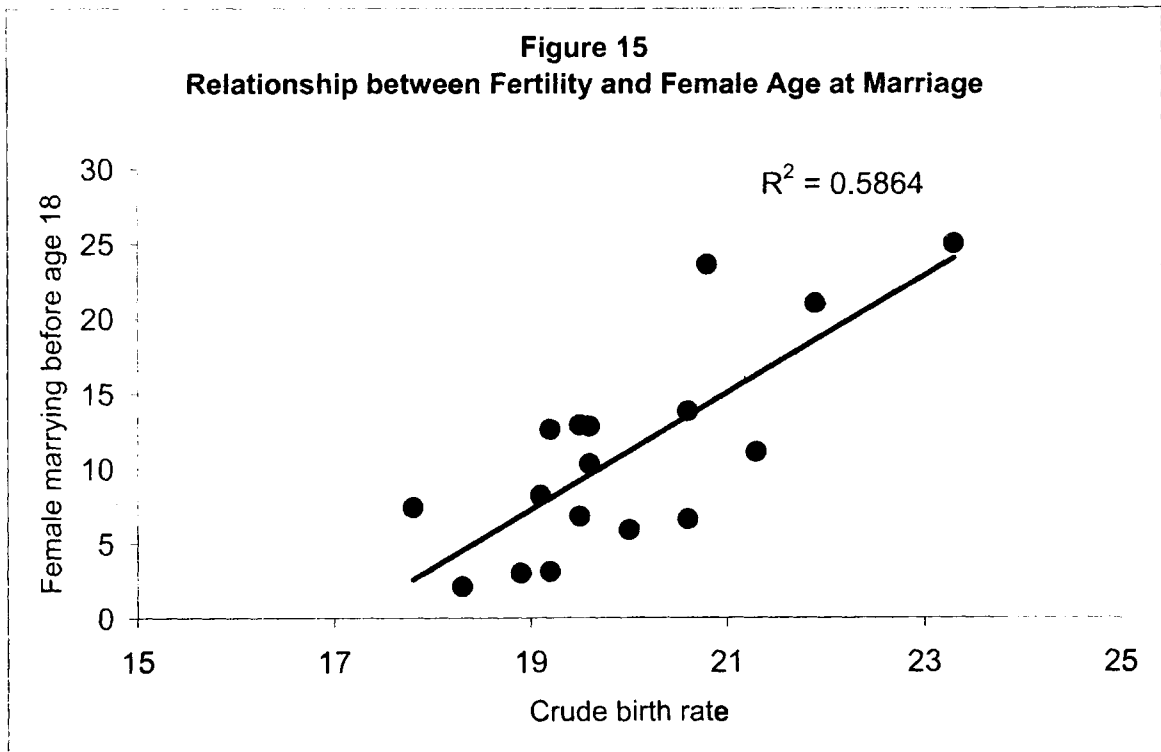
Like every major state in India, the demographic situation in Punjab is very different across communities, rural and urban areas and administrative units. Serious difficulties are encountered while capturing these variations meaningfully, even if they are useful for policy planning and programme implementation. One such constraint is lack of appropriate data for smaller units, particularly for districts that are at the hub of decentralized planning. Selected information from some recent surveys and estimations are by and large meaningful overview the demographic disparity in Punjab, which are manifestations of social, economic, cultural and other diversities.

Data on selected indicators reflect the demographic heterogeneity in Punjab. Lower rates of growth in Nawasahar (1.04%), Hoshiarpur (1.38%) and Moga (1.39%), and

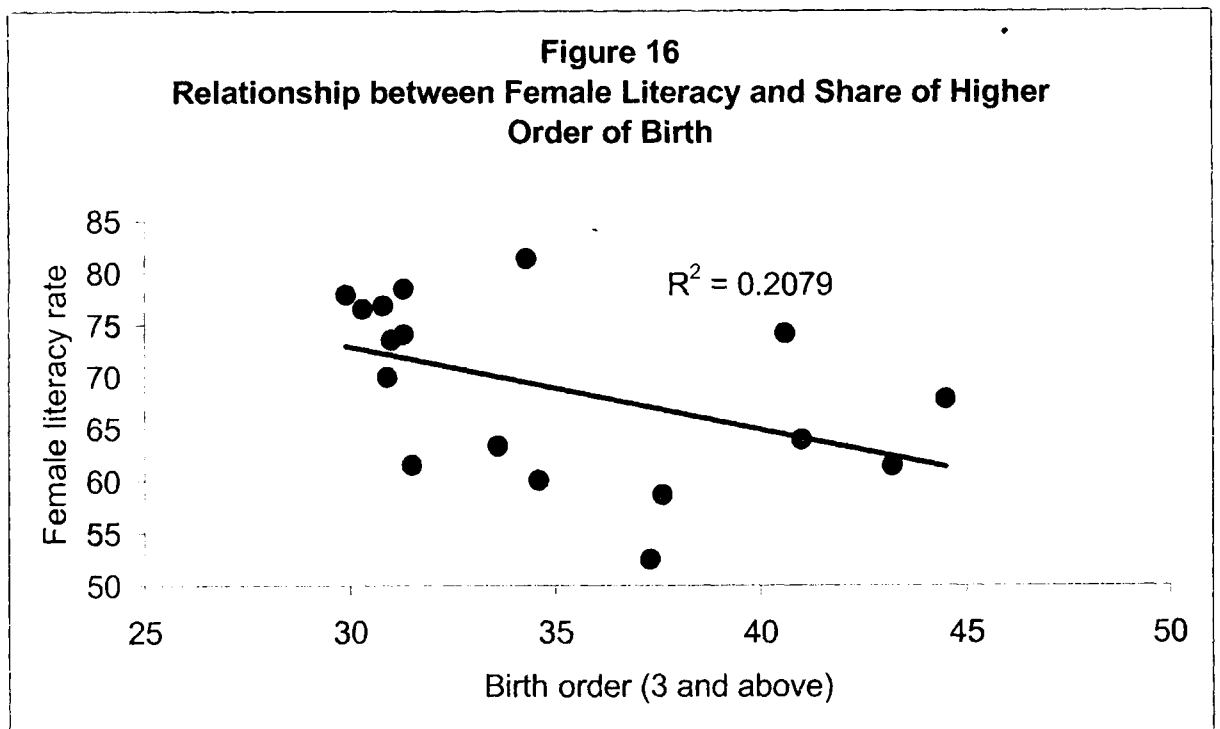
higher rates in Ludhiana (2.45%), Rupnagar (2.34%) and Amritsar (2.27%), as against the state average (1.98%) for the total population during 1991-2001 indicate the varied demographic situation. Even if fertility is declining in Punjab, variations in the fertility are still considerable. Recent indirect estimates (Guilmoto et al. 2002) indicate total fertility to range from as low as 2.1 in Jalandhar to as high as 2.8 in Firozpur in 2001; with districts in central Punjab recording lower TFRs (2.2 in Kapurthala and Nawasahar, and 2.3 in Hoshiarpur, Ludhiana) than their counterparts elsewhere. Data on birth-order indicate that in the high fertility districts a substantial share of women depart from the two-child norm and have more of higher-order births. For example, 45 per cent of births are third and higher order in Amritsar as opposed to 30 per cent in Jalandhar. Other districts where third and higher order births are sizeable in the state (36.0%) are Firozpur (43%), Moga (41%), Gurdaspur (41%), Mansa (37%) and Muktsar (38%), according to data from the 1998 Rapid Household Survey (RHS). District-level regression of fertility on some selected socio-economic variables for 1991 indicate that fertility is significantly correlated with female literacy rate, female mean age at marriage, percentage of married females in the age group 15-19, percentage of households with electricity connections, percentage of households living in *pucca* households (Registrar General, India 1997).

Variations in family planning practice, as a proximate determinant of fertility, can directly account for some inter-district differences. While on the whole Punjab has a higher level of contraception, couples in Rupnagar (71%) and Bhatinda (69%) were greater users of family planning methods than the couples in Mansa (64%), Moga (64%) and Firozpur (62%) in 1998. It is interesting to note that some low-fertility districts, namely, Jalandhar (65.0%), Hoshiarpur (64%), Kapurthala (63%) and Nawansahar (65%) are not at the top of family planning use. Age at marriage, a direct element in demographic change, varies considerably in Punjab. Districts where females marry earlier, before the legal minimum age 18, are mostly confined to the southwest (Firozpur, Mansa, Moga, Bhatinda and Faridkot). District level changes in the child sex ratio in Punjab can be viewed through the sex ratio at birth available from the Civil Registration System (CRS 1999), in spite of its inadequacies. Bhatinda (135), Mansa (135), Sangrur (137) and Patiala (136), all in the west, have very high masculine sex ratio (males per 100 females) at birth. Interestingly, in none of these districts reporting masculine sex ratio at birth, induced abortion is higher than the state average, except for Patiala, according to the 1998 RHS. On the contrary, the percentage of pregnancies deliberately aborted is reported to be high in Kapurthala (5.8), Jalandhar (5.1), Fatehgarh Sahib (5.0), and Amritsar (4.9).

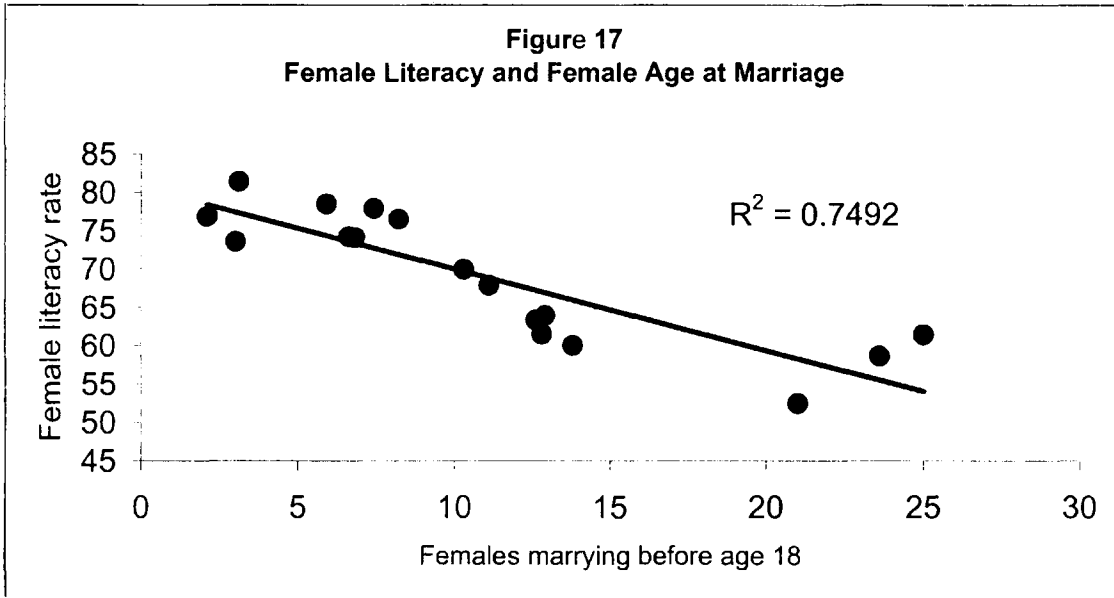
Correlation of some demographic variables with others at the district level reveals deficiencies of the quality of data and establishes the complexity of relationships in Punjab. In some cases the relationship is clear (Figures 15, 16, 17, 18 and 19), whereas in others (between sex ratio at birth and child sex ratio) it is intricate. Such patterns among demographic and socio-economic variables need elaboration and reinforce the need for policy interventions to be specific rather than grossly uniform across the state.



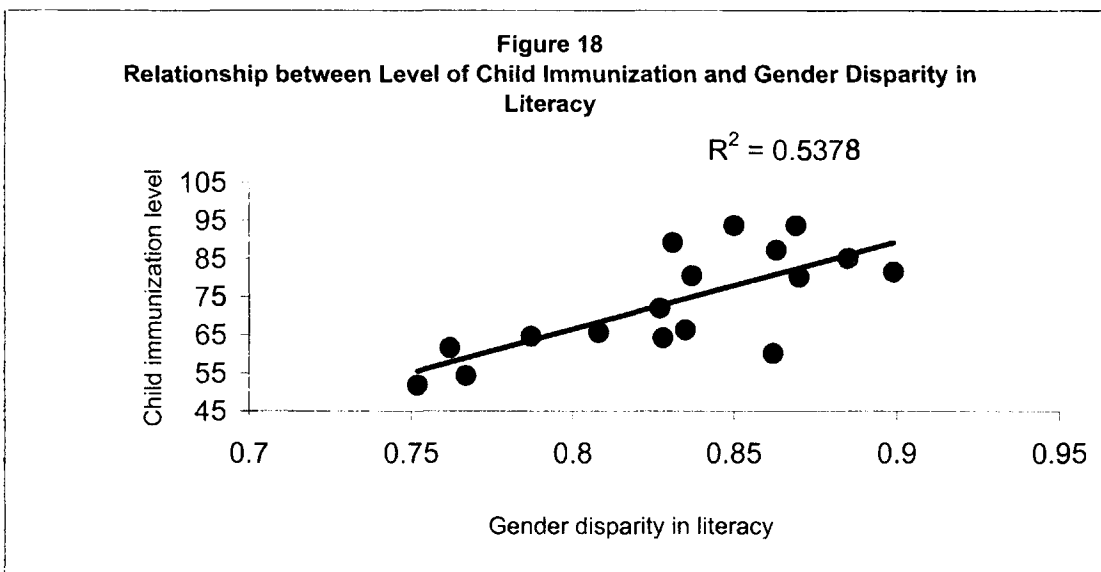
Source: Rapid Household Survey (RHS), 1998.



Source: Rapid Household Survey (RHS), 1998.



Source: *Rapid Household Survey (RHS), 1998.*



Source: 1. *Rapid Household Survey (RHS), 1998.*
2. *Provisional Population Totals, Paper 1, Punjab, Census of India 2001.*

POPULATION MIGRATION

Migration as an element of population change can play a significant role in social and economic development. For a variety of reasons, the perception about migrants is different across the society leading to debate about their contribution. Assessing the migration pattern in Punjab is difficult at this point of time, partly because the 2001 Census data on migration are not yet available to reflect recent changes in the mobility in the 1990s, and 1991 data on migration seem to be relatively old. However, existing

migration statistics may describe some of the patterns that have confronted Punjab till recently.

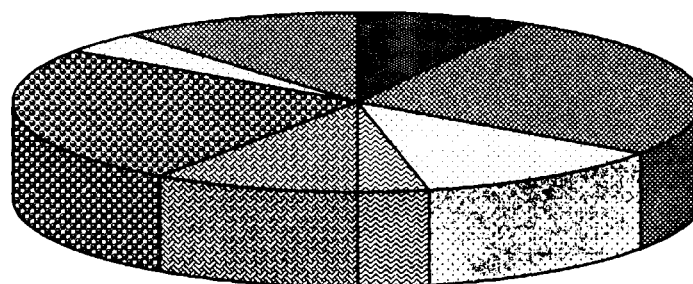
Migration into Punjab needs to be examined in terms of domestic and international sources. Depending on the definition, based either on place of birth or on place of last residence, used to measure migration in India, the 1991 Census enumerated 1.12-1.13 million interstate migrants into Punjab, who came from other states and Union Territories in India as compared to 0.87-0.89 million in 1981 and 0.58-0.64 million in 1971. Such migrants constituted 5.5 per cent of the total population in the state in 1991, 5.3 per cent in 1981 and 4.3 per cent in 1971. Sources of inflow indicate that the majority of domestic migrants into Punjab are from the adjoining and neighbouring states and Union Territories (Table 18). The only far-away locations from where people move in large numbers into Punjab are either in Bihar and Uttar Pradesh, which, together with the adjoining states and Union Territories, account for a little less than 90 per cent of interstate migrants into Punjab (Figure 19).

Table 18
Trends in Interstate Migration into Punjab (1971-1991)

Origin of migration	1971		1981		1991	
	Place of birth	Place of last residence	Place of birth	Place of last residence	Place of birth	Place of last residence
Bihar	1.3	1.3	5.8	5.4	8.1	7.9
Haryana	31.0	32.5	28.4	29.4	26.5	26.6
H. P.	15.4	13.7	12.9	12.1	12.1	11.7
J. & K.	4.5	4.1	3.5	3.4	3.2	3.2
Rajasthan	10.0	11.7	10.5	10.3	9.8	9.7
U. P.	24.0	22.4	25.2	24.0	24.9	24.4
Delhi	4.2	5.7	4.2	4.7	4.1	4.4
Others States and UTs in India	9.6	8.6	9.5	10.7	11.3	12.1
All interstate migrants	100.0 (584853)	100.0 (636230)	100.0 (872377)	100.0 (887492)	100.0 (1126149)	100.0 (1120282)

Source: Census of India 1971, 1981, 1991: Punjab.

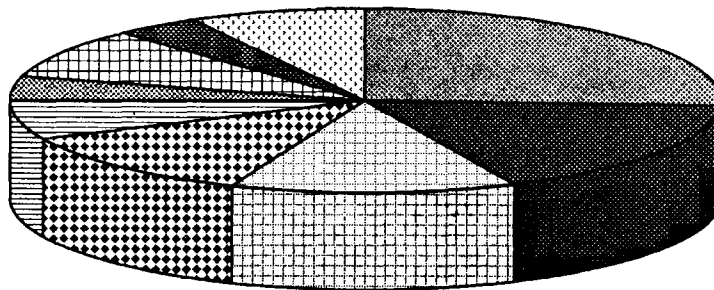
Figure 19
Interstate Migration into Punjab (1991)



■ Bihar ■ Haryana □ H.P. ▨ J and K ▩ Rajasthan ■ U.P. □ Delhi ▨ Others

Source: Census of India.

Figure 20
Interstate Out-migration from Punjab (1991)



Haryana
 Delhi
 Rajasthan
 U.P.
 H.P.
 Maharashtra
 Chandigarh
 M.P.
 Others

Source: *Census of India.*

Migration from across the border is negligible in Punjab. For 1971, 1981 and 1991, the total immigration (from the countries of Asia, Africa, Americas, Europe and Oceania) into Punjab has been estimated as 1.1 million, 0.87 million and 0.55 million respectively, according to the place-of-birth definition, and 0.81 million, 0.68 million and 0.47 million respectively, according to the place-of-last residence definition. Inflow of such magnitude may appear sizeable in absolute terms, but the reality is that a bulk of such migration is from a single origin and was a one-time affair as part of a tumultuous event in the history of India--partition and creation of the present day Pakistan--in 1947. The share of the movement from Pakistan in the total international immigration into Punjab remained incredibly high in the post-independence period, declining marginally from 98.5-97.9 per cent in 1971, to 98.3-97.9 per cent in 1981, and to 96.8-96.5 per cent in 1991, depending on the method of measurement. Next to Pakistan, the other source from where more than 10,000 international migrants have come to Punjab is Nepal. It is extremely difficult to record out-migration from Punjab to destinations outside the country accurately. Data on international out-migration from Punjab is extremely difficult to compile, making the available estimates inadequate and unreliable. Indirect evidence and periodic reports, other than migration statistics, tend to imply a regular and substantial emigration from Punjab, particularly the *Doaba* region.

Economic and social factors motivate people to leave their homes for new destinations, and this is true for migrants heading towards Punjab. Besides being part of the family movement, search for employment and matrimonial alliance are two major reasons why men and women migrate into Punjab. While male migration is mainly employment-related, female migration is predominantly due to marriage. During 1987-88, according to the National Sample Survey (NSS), nearly two-thirds of the male in-migrants explained their movement as primarily employment- and business-related, and 28 per cent associated the moves with family movement. Among female in-migrants, 76 per cent attributed their movement to marriage, and 16 per cent to migration of the family to which they belonged, in the rural areas of Punjab. Similarly, among all urban male in-migrants, 50 per cent cited (better) job prospects as the main reason for relocation, and 30 per cent said that they accompanied their families, as against 43 per cent and 46 per cent of females who gave the main reason as marriage and accompanying their families into towns and cities.

Even if out-migration is considered to be significant in Punjab, reliable data is available only for those going to other place in the country. According to 1991 migration statistics, based on the place-of-birth definition, 1.38 million interstate migrants from Punjab were found in other States and Union Territories. Within India, outward migration from Punjab is mainly directed towards the neighbouring States and Union Territories, which receive a little more than three-fourths of the interstate outflow from Punjab. For example, the most popular destinations outside the state, for those leaving Punjab, are places in Haryana, Delhi, Rajasthan, Uttar Pradesh, Himachal Pradesh, Maharashtra, and Madhya Pradesh. Out of 100 persons migrating from Punjab to different places in India, 26 go to Haryana, 17 to Delhi, 13 to Rajasthan, 12 to Uttar Pradesh, seven to Himachal Pradesh, and four each to Madhya Pradesh and Maharashtra. In the absence of the 1991 data on population movements towards Jammu and Kashmir, if Chandigarh is added to the list of destinations, the above States and Union Territories together are home to 92 per cent of interstate migrants from Punjab. This indicates that as in other states, domestic migration from Punjab is primarily middle- and short-distanced. Since 1971 there has not been any significant change in the inland destinations of migrants from Punjab. They constitute a sizeable proportion in Himachal Pradesh (43%), Haryana (23%), Rajasthan (14%), Uttar Pradesh (9%) and Delhi (7%), and are significant from the point of view of these States and Union Territory, according to the place-of-birth statistics of 1991.

POPULATION POLICIES AND PROGRAMMES: NEED FOR STATE POPULATION POLICY

In the Indian context, the population policy is basically meant to lower fertility through greater family planning efforts. It covers other areas such as marriage, mortality, migration, reproductive and child health, other health care delivery, gender relations, nutrition, community participation and communication that aid reduction in fertility levels. Institutionalization of demographic and related concerns through setting up long-term and short-term goals, organizational arrangements, outlining frameworks for interventions, specification of operational strategies, provision of monitoring and evaluation, and mechanisms of impact-assessments may also be some other elements of such a policy. Programmes are designed and put into practice, by (with support from) the government, to influence demographic structures and trends with or without explicit policy statements to cover relevant tasks.

Scores of programmes, mostly sponsored by the Union Government, address the demographic and related issues of Punjab; some more directly than others. Infrastructure, transport, community participation, women's involvement, health guides, reproductive and child health, school health check-up, training of health workers, post-partum services, contraception, sterilization beds, social marketing, information, education and communication, etc., are some of the critical areas covered in the state by the department of family welfare under a host of schemes. While some of these schemes are evaluated and feedback made available, others need to be examined for making them more effective for promoting health and population outcomes, with or without a population policy for Punjab.

The National Population Policy 2000 (NPP 2000) is a milestone in dealing with issues related to health and family welfare, and reflects the national demographic concerns of

the country. While the NPP 2000 addresses diverse national issues, there is need to prioritize the concerns and focus on the policy options at the state level, for which the state population policy is an excellent instrument. Moreover, as a step towards grassroots planning, it has the advantage of accommodating the district and community level interests singularly. Perhaps this is the reason why state level population policies are being increasingly formulated in India to focus on specific problems in greater detail. Since health is a state subject, such documents are increasingly seen as documents of decentralization, regional planning, integration with the national scene, local commitment, and desire to deal with the problem differently. Formulated in this background, there is neither disagreement nor duplication between the NPP and the state population policies. In fact, the NPP can provide an important framework for the advocacy and operationalization of state population policies, which can supplement the goals of NPP. This synergy between the two is particularly useful when the states are guided and funded by the Union Ministry of Health and Family Welfare in the matters of its concerns.

The states are realising progressively the role of the state population policy in charting out the course of population growth in the context of the commitment to time-bound benchmarks, decentralized planning and socio-economic development. Hence, such states as Gujarat, Karnataka, Madhya Pradesh, Maharashtra, and Rajasthan have already announced their respective state population policies, whereas Haryana, Kerala, Orissa, and Tamil Nadu, Uttar Pradesh are in the process of drafting them. In the long term, health and demographic programmes, tailored to the goals enunciated in the state population policy, are to provide continuity to population stabilization efforts. Realization of the spirit of the SPP is a step forward in shaping the demographic dimensions in tune with welfare, as well as sustainable development objectives. However, in spite of the centrality of demographic issues in public policy measures, Punjab has not yet come out with a population policy. While initiatives have reportedly been taken in this regard in drafting the policy, the government is yet to adopt it, and the details have not been made public for initiating debates and discussions in relevant circles. Some recent developments, particularly in the field of data availability from the Census of India 2001, National Family Health Survey (NFHS), Rapid Household Survey (RHS) and completion of a set of thematic in-depth studies at the micro-level, perhaps fulfill the primary information needs for such a policy at the state level.

Creation of institutions, such as State Population Commission, not necessarily in the pattern of the National Population Commission, can also help in need-assessment and envisaging near- and far-term objectives for the state. With adequate provision of inter-sectoral co-operation beyond official organs, such a commission can foster and mobilize the desired impact. If needed, a special piece of legislation on the subject can also motivate the government. These steps would presuppose not only a non-traditional approach and strong political commitment, but also critical evaluation of the efforts undertaken till date.

DEMOGRAPHIC CHALLENGES AND OPPORTUNITIES: PERSPECTIVES FOR FUTURE

Attempts at greater economic and social development in Punjab must also include focus on demographic dynamics. The demographic challenges the state faces today are manifold and steps are needed to address these concerns. Demographic goals may be easily articulated, quantified and enunciated in policy documents, but translating them into reality is difficult. Bringing about desired behavioural changes in the target population is complex and time-intensive. This is why demographic programmes have long gestation periods for yielding results. Moreover, unlike other areas, the spillovers are crucial to demographic attainments and there is a great deal of interdependence between population dynamics in the state and events outside. As elsewhere, anchored strongly in the economic and social conditions of the people, the fate of demographic development in the state is going to be profoundly influenced by the strategies of economic development and overall improvement in living standards.

The contours of population planning must go beyond the goals set in the National Population Policy and cover grounds that are central to larger issues of human development. Some of the direct and foreseeable demographic challenges that Punjab faces today can be outlined as attainment of replacement level of fertility, elimination of early-age child-bearing, reducing infant and childhood mortality coupled with excess female disadvantage, getting rid of sex-selection during conception and practice of female foeticides, balancing a skewed sex ratio that is highly masculine among children, eliminating extensive son-preference, raising low hospital delivery rates resulting in undesirable maternal deaths, changing the unfavourable demographic regime among socially and economically weaker sections, meeting the unmet need for contraception, promoting men's participation in family planning, removal of regional demographic disparities, and preparations for dealing with an ageing population. At one level, these thematic areas must be at the core of a series of actions by the state, whereas at the other, some critical areas should be simultaneously considered to make the thematic outcomes successful. There are listed below.

Restoration of public confidence in government's health sector is a daunting task and has implications for achievement of demographic goals in the state. In rural areas, Community Health Centres, Primary Health Centres, Subsidiary Health Centres, and Sub-centres are not fully equipped to respond to people's needs and are known to have constraints that prevent optimum utilization of their services. Since family planning is largely seen as the government's initiative and is implemented through the health department, health sector performance is critical to the success of the family planning programme.

Another area, which merits serious attention, is the need for greater public participation. Broad-basing community participation implies not only greater involvement in programme-implementation but in policy formulation as well. Schemes do not succeed because they do not reflect the needs and concerns of the people with changing times. Programmes are not altered in tune with the changing reality in rural or in urban areas. With the 73rd and 74th Constitutional Amendments providing a framework for grassroots devolution and local participation, efforts to stabilize population can only succeed if the functions, functionaries and funds are used in keeping with expectations of the public at all levels. Related with this is the identification of fringe and vulnerable groups and

ensuring that their legitimate interests are well represented in programme formulation and implementation. Scheduled Caste population, migrant groups, landless households, slum dwellers, etc., constitute such marginalized sections whose demographic profiles might need more attention. Creating adequate opportunities for these groups and safeguarding their interests are also major tasks of the future for achieving demographic goals. The current programme interventions do not address gender disparities adequately. Much of the success in population and related programmes depends on how the issues that confront women and children are reflected in the policy and programme priorities. Since women are at the centre of demographic change, creating a mechanism that is sensitized towards their position in society, will also determine the success of initiatives by the government.

Reliable, long-term and cross-sectional data aid demographic assessments, make policy formulations and programme interventions accurate as well as focused. In Punjab, there is need to encourage indigenous data generation, particularly in the course of programme intervention. Overhauling present data collection, compilation, management and use-systems, is long overdue, as the current management information system does not keep pace with the rapid and ongoing changes in the society. Useful data have to be regularly collected, rigorously tested, systematically compiled, and made accessible to the public. Demographic publications are not many, not updated regularly, and are not widely available, leading to poor public perception of the issues involved. The focus on segmentation at various levels is lacking, with maintenance of records in most of the health institutions deficient and unreliable. Utility of data management is yet to be fully understood and the meagre networking with nodal centres yields fewer inputs to field staff. There is need to examine the constraints and provide strong support to such endeavors, in terms of allocation of funds, qualified personnel and infrastructure. Efforts of Punjab Health Systems Corporation (PHSC) in compiling and analysing data from 154 hospitals and community health centers (CHCs), to identify areas of intervention and bring about improvements, are a step forward.

Turning the demographic tide is not difficult in Punjab, with higher ranking in human development being its great asset. The state has some inherent healthy features that are the source of enormous advantage in population planning and weigh heavily in favour of attempts to define and shape demographic attributes. Provision of a wide rural infrastructure, wider access to basic amenities, high and balanced urbanization pattern, low incidence of poverty, less rural-urban gap in the provision of health services, an innovative and spread-out private sector, household prosperity, regular media exposure, greater female literacy, traditions of religious philanthropy, etc., act as force-multipliers in intervention activities and hold out great promise for efforts to change the population profile.

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Chapter 10

HEALTH

INTRODUCTION

Health is clearly stated as a priority, in the First Five Year Plan: 'nothing can be considered of higher importance than the health of the people which is a measure of their energy and capacity as well as of the potential of man-hour for productive work in relation to the total number of persons maintained by the nation. For the efficiency of industry and of agriculture, the health of the worker is an essential consideration'.¹ To define health is a complicated task. Medical professionals look at health as the absence of disease. The World Health Organization (WHO) defines health as a state of complete physical, mental and social well-being and not merely an absence of infirmity and disease. As reflected in many studies, the health of an individual does have a direct relationship with human resource development and economic development.

This chapter attempts to describe the development of health services, particularly after 1966. Starting from a historical perspective of health-planning in India and Punjab, it analyses various issues, mainly related to trends in outlays and expenditure during the different Five Year plans and the annual plans; availability of infrastructure facilities and other health services in Punjab during 1966-2001; morbidity and treatment pattern; health-seeking behaviour and utilization patterns of available health care facilities and services; health of the vulnerable population with special reference to maternal and child health services; status of nutrition; and the disabled population. An attempt has also been made to incorporate the health provider's perspective as to what needs to be done further for developing the health sector and services in Punjab. The last section describes the vision and works out some operational strategies to achieve the same.

A HISTORICAL PERSPECTIVE

Health Planning in India

Health Planning in India started, as early as in 1943, when the Bhole Committee was appointed to go into health and medical needs of India. The committee recommended the control of major communicable diseases, and development of health organizations for providing health services to the people. Its recommendations were given due importance during the subsequent five year plans. At the time of independence in 1947, the health infrastructure was mainly urban and clinic-based, providing only curative services. On 2 October 1952, rural health services were launched through a Primary Health Centre (PHC) in each block, covering a population of 66,000. Along with the establishment of health-centre complexes, a number of disease control programmes were taken up (vertical programmes), to be integrated with rural health services. They were malaria, filaria and goitre in the 1950s; leprosy, tuberculosis and small pox in the 1960s; and the expanded immunization programme (EPI) and National Programme for Control of Blindness in the 1970s. Thus, by the end of the Third Five Year Plan, India

¹ *The First Five Year Plan*, Planning Commission, Government of India, p. 488.

laid the foundation of basic health services, originally defined by the WHO as 'a network of coordinated, peripheral and intermediate health units with a central administration, capable of performing effectively a selected group of functions essential for the health of a nation, and assuring the availability of competent professional and auxiliary personnel to perform these functions'.² Subsequent five year plans focused on the need to integrate family planning with maternal and child health (MCH) and nutrition services, and to intensify control of communicable diseases, particularly malaria and small pox, and also the training programmes. The Sixth Five Year Plan (1980-85) adopted the goal of Health for All (HFA 2000 AD) and the net reproduction rate (NRR) of Unity by 2000 A.D. The plan provided for restructuring norms for rural health infrastructure and its vast expansion and development of promotive and preventive services along with curative facilities. In 1983, for the first time, a National Health Policy was formulated. It laid stress on preventive, promotive, public health and rehabilitative aspects of health care and pointed to the need for establishing comprehensive primary health care services to reach the population in the remotest areas of the country.

In the Seventh Five Year Plan (1985-90), the major thrust was laid on the consolidation of the health infrastructure already developed. The objectives of the Eighth Five Year Plan (1992-97) realized that the health facilities must reach the entire population by the end of the plan period. The HFA paradigm must take into account not only high-risk vulnerable groups, i.e., mothers and children, but also focus sharply on the underprivileged segments, and, therefore, within this strategy, 'Health for Underprivileged' would be promoted consciously and consistently. The Ninth Five Year Plan (1997-2002)³ observed that inappropriate location, poor access, poor maintenance, gaps in critical manpower, mismatch between personnel and equipment, lack of essential drugs/diagnostics, poor referral linkages, are some of the factors responsible for sub-optimal functioning of primary health care institutions. The plan in general aims to improve the health-status of the population by optimizing coverage and quality of care by identifying and rectifying the critical gaps in infrastructure, manpower, equipment, essential diagnostic reagents and drugs.

Most recently, the Ministry of Health, Government of India has prepared the National Health Policy (NHP) 2002. The main objective of NHP-2002 is to achieve an acceptable standard of good health among the general population of the country.

Health Planning in Punjab

Punjab, as such, does not have any specific health policy of its own. Health programmes in the state, as in most of the other Indian States, have continued to pursue, the policies of the Union Government. Even though health is a state subject, the policies and programmes framed by the Central Government are top priorities, as they are usually accompanied by a grant component, sometimes up to 100 per cent.

Prior to the beginning of the Fourth Five Year Plan, efforts had already been made to expand the health services to meet the requirements of the people of the state,

² Dutt, P.R., *Primary Health Care Rural Communities*, Vol. 1 (1993), Gandhigram Institute of Rural Health and Family Welfare Trust, Tamilnadu, India, p.4

³ *Ninth Five Year Plan (1997-2002), Thematic Issues and Sectoral Programmes*, Government of India, Planning Commission, New Delhi, p. 142.

according to the guidelines laid down by the Central Government. However, the problem of making these services adequate for the community was yet to be solved: The population served in 1966 was 2,758 per doctor, 8,119 per midwife, 7,797 per nurse and 1,384 per dai, which were grossly inadequate. The total numbers of beds available (8,737) in 1966 were much less, and on an average 72 beds were available per lakh of population. Moreover, there were large-scale disparities in the availability of beds. For example, three districts, namely, Amritsar, Ludhiana and Patiala had 57 per cent of the total beds available in the state. It was stated in the Draft Outline of Fourth Plan that 'there has been a steady increase in the health facilities available in the Punjab State but, unfortunately, the gains made had been absorbed by the growing population'⁴. It was further felt that 'there should also be qualitative improvements in the service rendered to the community. Whatever the deficiency in the registration of "vital statistics", the high death rate as well as high infant mortality rate are indicative as much of the inadequacy and the low quality of health services available to the population in general'⁵. It was felt that there is an urgent need to expand the health facilities at a faster rate than the rate of growth of population particularly in Sangrur, Bhatinda, Ferozepur, Rupnagar, Hoshiarpur and Gurdaspur districts.

Based on the above few priorities listed in the Fourth Plan, allocations were made to improve the quality of service, particularly in rural areas, and meet the need for special inducement and facilities provided to the medical and paramedical personnel. 'Thus, during the Fourth Five Year Plan, efforts were made to provide medical and health facilities to the people, both in urban as well as in rural areas of the State. Efforts were made to improve the hospitals in the matter of staff, equipment and physical facilities and the highest priority was assigned to the family planning programme to check the growth of population in the State'⁶. For the first time, Rupees 25 lakh were earmarked for 'Child Health Care Campaign' in the last year of the Fourth Plan (1973-74), out of which only Rupees 16.63 lakh were utilized.

The Fifth Five Year Plan laid emphasis on building the health infrastructure. It was proposed to establish health Sub-centres at the rate of one each for a population of 10,000. Provisions were incorporated for upgradation of 29 PHCs to 30-bedded rural hospitals. Proposals were made for opening 150 new dispensaries in rural areas and to establish dental clinics in each block. There were proposals to open new Ayurvedic/Unani dispensaries, and to establish common medical facilities in rural areas, including diagnostic facilities such as X-Ray, laboratory, operation theatre and library for doctors serving in these areas, and completion and improvement of existing district hospitals.

In the Sixth Five Year Plan, it was strongly felt that the existing number of medical institutions in the state was sufficient to meet the needs of the people. Simultaneously, it was also felt that the expansion of these institutions had not been brought to a reasonable norm of efficient functioning. A number of shortcomings, such as shortages of para-medical staff, buildings, modern machinery and equipment in the working of public health system were noticed. As a result, it was considered appropriate to go slow

⁴ *Draft Outline Fourth Five Year Plan Punjab State*, Planning Department, Government of Punjab, p. 75

⁵ *Ibid*, p. 75

⁶ *Draft Fifth Five Year Plan (1974-79)*, Planning Department, Government of Punjab, Chandigarh, p. 171.

with further expansion and concentrate on meeting existing deficiencies and improving operational efficiencies of medical institutions in the state. Thus, the Sixth Plan focused on improvement of infrastructure and provision of quality health services. Under public health, the Seventh Plan provided adequate outlays for purchasing essential machinery and equipment, replacement of obsolete equipment and for the completion of spill-over work, so as to optimally utilize the investment already made. During this plan, 330 Subsidiary Health Centres (SHCs), more commonly known as rural dispensaries, were upgraded to the level of Primary Health Centres (PHCs), raising the total to 460, i.e., one each for approximately 30,000 rural population. An additional community health officer, staff nurse, laboratory technician and two class IV employees were provided to PHCs. In tune with the earlier FYPs the Eighth Five Year Plan aimed at strengthening the infrastructure, provision of equipments and manpower development. A section on state-specific strategies laid down that for 'States like Punjab and Haryana with above average level of infrastructure and below average performance in some health indices, specific efforts need be made to identify the factors responsible for the relatively poor performance and correct them'.⁷ Punjab's, Ninth Plan highlighted the need to strengthen the existing health infrastructure. It was felt that despite rapid expansion, the majority of the institutions were without proper buildings. The main role of the Ninth Plan envisaged consolidation and strengthening of existing medical institutions (Allopathic, Ayurvedic and Homeopathic) in the state, by meeting the existing deficiencies in building, machinery and equipment, and provision of basic minimum services in the health sector. A proposal was also made to establish a four-bedded hospital each at 277 focal points in the state.

A Punjab Health System Corporation (PHSC) was set up in 1996-97 covering 150 hospitals at the level of Community Health Centres, sub-divisional hospitals and district hospitals. Among these, 86 medical institutions are situated in rural and 64 in urban areas. The corporation upgraded the facilities with the aid of a soft World Bank loan (70%), state government (20%) and other loans (10%). User charges in the 150 hospitals are levied at the same rate as in other hospitals in the state. Collections through user charges are retained entirely by the hospitals concerned, unlike the collections from hospitals not covered by the Corporation, which accrues to the state exchequer. Thus, the burden of servicing the World Bank loan (after a five year loan moratorium) will be borne by the state government, to which the charges levied on beneficiaries of the loan at present do not accrue. It is thought that five years hence, user charges on all improved facilities could be enhanced. At that stage, there could perhaps be an earmarking of a portion of the enhanced charge for servicing the loan.⁸

Most recently, the Tenth Five Year Plan of the Government of Punjab indicates that 70 per cent sub-centres, 67 per cent Subsidiary Health Centres (dispensaries), 62 per cent Primary Health Centres and 51 per cent Community Health Centres are without proper buildings. A total sum of Rupees 32,840 lakh would be needed to provide proper buildings for these institutions. Like the earlier plans, the major thrust of the Tenth Five Year Plan would be to consolidate and strengthen the existing medical institutions in the state in Allopathic, Ayurvedic and Homeopathic medicines, by removing the existing deficiencies in buildings, medicines, machinery and equipment and providing basic

⁷ *Ninth Five Year Plan (1997-2002), Volume II, Thematic Issues and Sectoral Programmes*, Government of India, Planning Commission, New Delhi, p. 148.

⁸ Indira Rajaraman, Hiranya Mukhopadhyay, H.K. Amar Nath *State Fiscal Studies: Punjab*, National Institute of Public Finance and Policy, New Delhi, 1999. p.26.

minimum services in the health sector. Besides extending the targets covered in the Ninth Plan, the Tenth Plan has emphasized mental health care, biomedical waste and diagnostic services in the state, setting up an institute of para-medical services, opening new dispensaries in urban slum areas, provision of toilets and attendants, accommodation in medical institutions, establishment of new PHCs/upgradation of existing SHCs to PHCs and completion of the provision for four-bedded hospitals at the remaining 197 focal points out of the 277 selected.⁹

From the above, it should be evident that during the formulation of all the Five Year Plans, the focus of the state government has largely remained on strengthening the health infrastructure in the form of buildings, machinery, equipment and manpower for primary health care. It did not realize the importance of having a proper health management information system, which would have helped in setting need-based priorities. Moreover, the state has not made many efforts to establish referral linkages, management of life-style diseases -- diabetes, cancer and cardiovascular diseases, regulation of private health care services, and involving the voluntary sector in different health programmes.

RESOURCE ALLOCATION AND EXPENDITURE

The major industrial countries of the world spend a substantial portion of government expenditure on health. For example, United States, Australia, Switzerland and United Kingdom spend between 14 to 20 per cent of their total expenditure on health. The Asian countries, such as Bhutan, Maldives, Thailand, Sri Lanka and Malaysia, spend six to ten per cent, while India spends a considerably low amount, at around 1.5 per cent of its total expenditure on health.¹⁰

Outlays and Expenditure during the Five-Year Plans

In Punjab, the percentage share of medical and public health sector in the total budget outlay has been fluctuating between 1.8 per cent and 4.5 per cent during the different Five Year Plans. Table 1 gives percentage shares in total outlay and total expenditure and proportion of total expenditure to total outlay for medical and public health (MPH), nutrition and social services¹¹ other than MPH and nutrition.

Table 1 indicates that during all these Five Year Plans, outlays on MPH have remained between 1.9 per cent and 4.5 per cent of the total outlay, nutrition between 0.04 to 0.5 per cent and other social services between 12.3 to 28.3 per cent. On the other hand, expenditure patterns indicate that in reality the percentage share of MPH had been between 1.5 and 2.5 up to the Eighth Plan and rose to 4.2 per cent during the Ninth

⁹ *Tenth Five Year Plan and Annual Plan, Government of Punjab (2002-2003)*

¹⁰ *Health Information of India, 1997-98, Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi*

¹¹ Most recently these include general education, technical education, sports and youth services, art and culture, medical and public health, water supply and sanitation, housing (including police housing), urban development (including state capital project), information and publicity, welfare of SCs, STs and other BCs, labour and labour welfare, social security and welfare, other social services, and defence services welfare.

Plan; for nutrition it was insignificantly low between 0.04 to 0.3 of the total expenditure during all the Five Year Plans. However, the share of expenditure on other social services (excluding MPH and nutrition) rose considerably during all the Plans from 10.8 per cent in the Fourth Plan to 24.0 per cent in the Ninth Plan, which indicate clearly that health and nutrition has been accorded a lower priority among the social services.

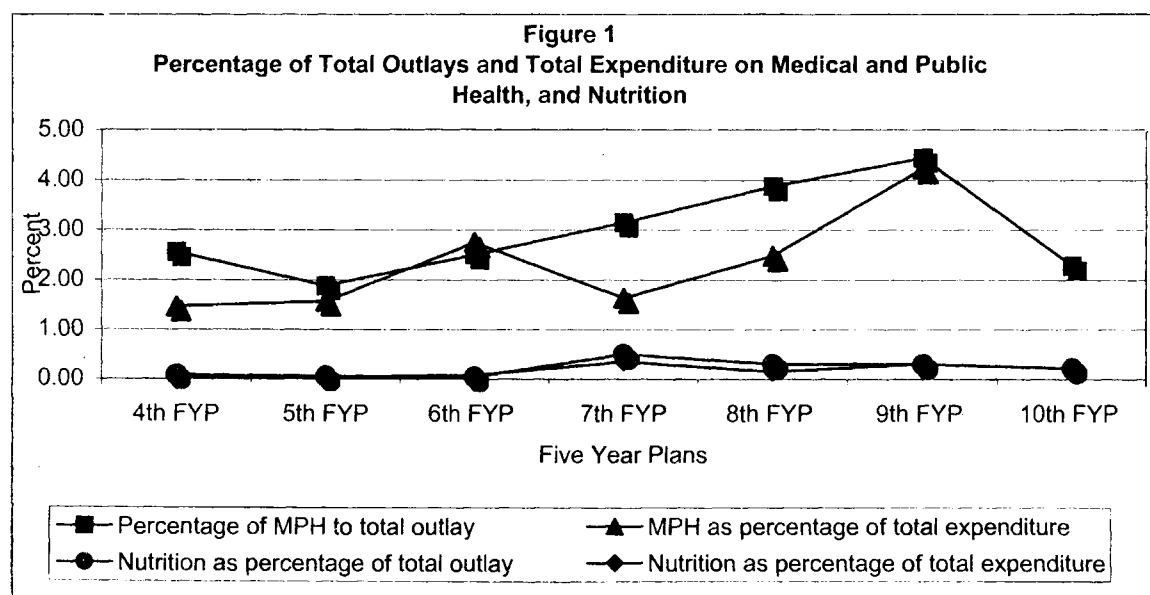
Table 1
Proportions of Outlays and Expenditure on Medical and Public Health, Nutrition, Social Services in Punjab (as percentage of total), 1969-2007

Five Year Plan (FYP)/ period	Percent share in total outlay			Percent share in total Expenditure			Proportion of total expenditure to total outlay		
	MPH	Nutrition	Social services (excluding MPH and nutrition)	MPH	Nutrition	Social services (excluding MPH and nutrition)	MPH	Nutrition	Social services excluding MPH and nutrition
4 th FYP (1969-74)	2.55	0.09	13.14	1.47	0.04	10.76	0.83	0.66	1.19
5 th FYP (1974-78)	1.88	0.06	20.17	1.57	0.04	18.77	0.58	0.50	0.65
6 th FYP (1980-85)	2.50	0.04	16.31	2.75	0.08	13.42	1.06	1.81	0.79
7 th FYP (1985-90)	3.15	0.50	12.35	1.64	0.35	11.45	0.56	0.75	1.00
8 th FYP (1992-97)	3.88	0.30	24.55	2.49	0.15	20.20	0.66	0.50	0.85
9 th FYP (1997-02)	4.45	0.30	28.26	4.24*	0.31*	24.01*	0.74*	0.79*	0.66*
10 th FYP (2002-07)	2.28	0.22	20.81	NA	NA	NA	NA	NA	NA

Source: Calculated on the basis of information provided in different issues of *Statistical Abstracts of Punjab/Annual Plans, Five Year Plan and Annual Plan Documents*

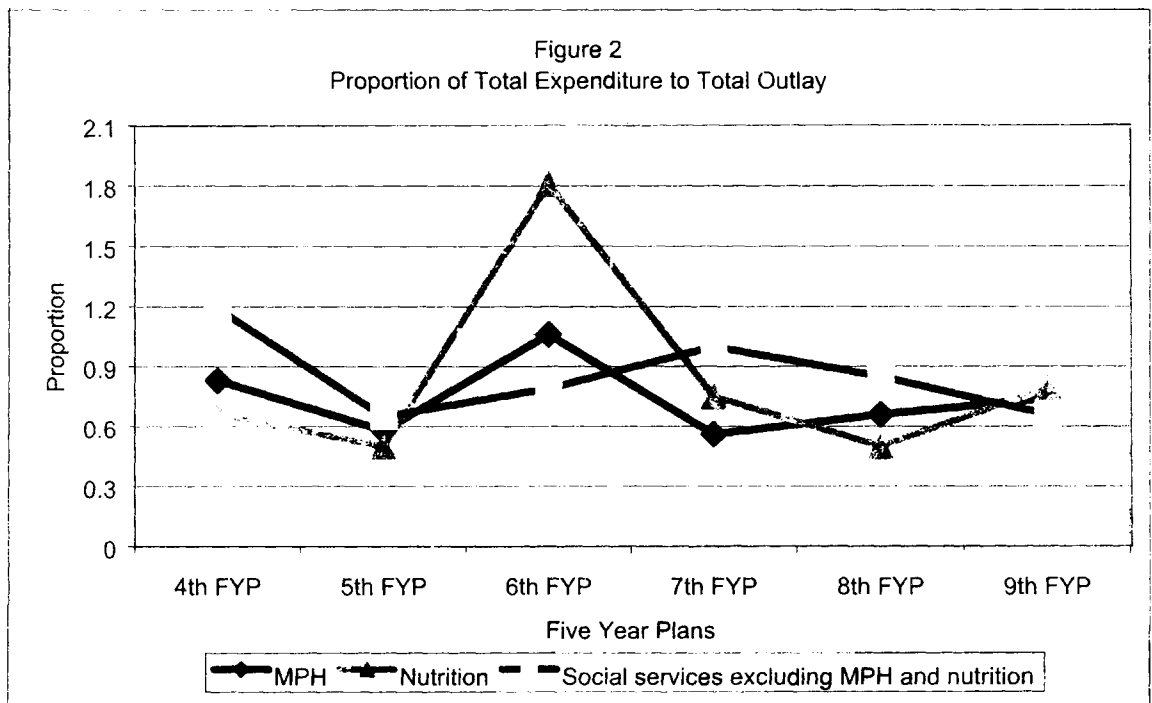
Note: * - Includes anticipated expenditure for the annual year 2001-2002.

Figure 1 indicates the percentage of total outlays and expenditure on MPH and nutrition. It is evident that the total expenditure was minimum during the Fourth Plan and the maximum during the Ninth Plan. Except for the Sixth Plan, the expenditure has always been less than the total outlay, indicating a poor performance of the plan. The outlays for nutrition during the different five-year plans indicate that it has always had a very small share of the total budget (0.1-0.5%), and even that money was not spent fully.



Source: Various volumes of *Statistical Abstract, Punjab*

The proportions of total expenditure to total outlays indicate that MPH and nutrition were accorded less priority among the social services (Table 1 and Figure 2). If we examine the proportionate figures for total outlays and total expenditure, we find that except during for Sixth Plan and marginally during the Ninth Plan, when the proportion of actual expenditure to total outlay was more for MPH and nutrition, the expenditure on other social services has always been higher.



Source: Various volumes of *Statistical Abstract, Punjab*

Outlays and Expenditure during the Annual Plans (1980-2002)

Table 2 gives the percentage of annual share in total outlay and total expenditure on medical and public health and social services excluding MPH. These have increased over time for both the categories, i.e., MPH and social services excluding MPH. However, the increase in other social services expenditure is higher than that of MPH.

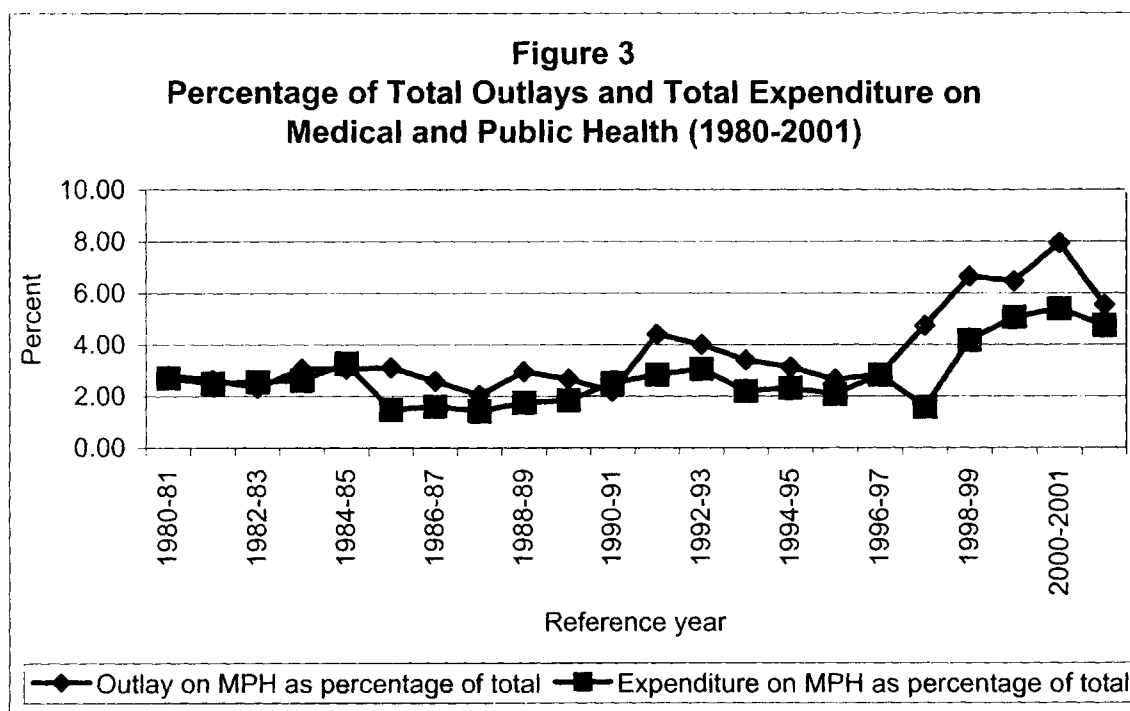
Table 2
Proportions of Outlays and Expenditure on Medical and Public Health, Social Services
Excluding MPH in Punjab (as percentage of total), 1980-81 to 2001-2002

Annual Plan	Percent share in total outlay		Percent share in total Expenditure		Proportion of total expenditure to total outlay	
	MPH	Social services (excluding MPH)	MPH	Social services (excluding MPH and nutrition)	MPH	Social services excluding MPH and Nutrition
1980-81	2.80	16.62	2.73	16.84	0.97	1.01
1981-82	2.64	16.29	2.51	14.25	0.95	0.88
1982-83	2.34	12.21	2.57	11.85	1.10	0.97
1983-84	3.07	12.04	2.63	11.39	0.83	0.92
1984-85	3.07	11.81	3.28	13.44	1.04	1.11
1985-86	3.11	12.25	1.49	9.94	0.47	0.80
1986-87	2.58	12.72	1.61	9.66	0.73	0.89
1987-88	2.04	10.52	1.43	8.81	0.74	0.88
1988-89	2.95	11.50	1.76	11.55	0.61	1.02
1989-90	2.66	22.83	1.85	17.09	0.76	0.82
1990-91	2.19	19.02	2.52	13.23	1.26	0.76
1991-92	4.40	21.81	2.85	19.05	0.68	0.92
1992-93	4.00	25.30	3.07	20.54	0.59	0.63
1993-94	3.40	22.64	2.21	24.54	0.59	0.99
1994-95	3.13	26.94	2.32	22.78	0.85	0.97
1995-96	2.65	21.19	2.09	18.30	0.86	0.94
1996-97	2.85	23.68	2.84	17.78	0.97	0.73
1997-98	4.73	25.69	1.58	19.00	0.32	0.71
1998-99	6.64	25.27	4.18	18.46	0.50	0.59
1999-2000	6.46	31.68	5.07	30.87	0.51	0.64
2000-01	7.93	27.22	5.40	22.31	0.56	0.67
2001-02	5.54	23.59	4.74*	28.73*	0.86*	1.22*
2002-03	3.33	20.41	NA	NA	NA	NA

Source: Calculated from the information provided in various issues of *Statistical Abstracts of Punjab/Annual Plans*

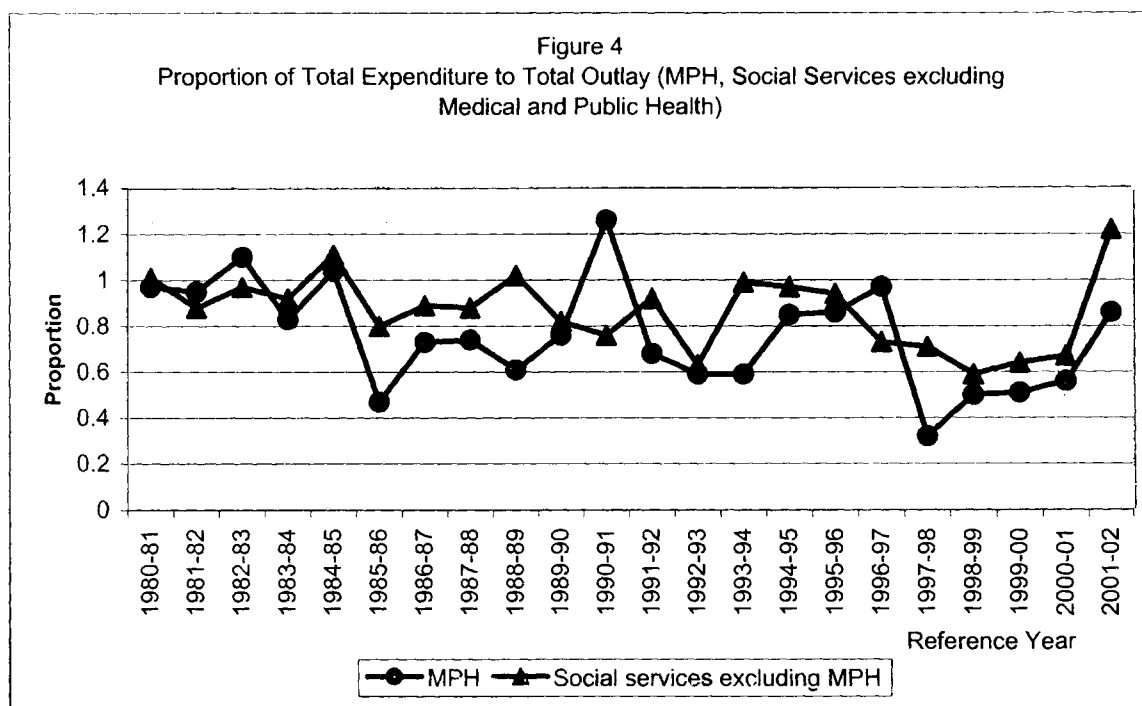
Note: * - Includes anticipated expenditure for the annual year 2001-2002.

Figure 3 shows that the share of the medical and public health sector in the total outlay during the annual plans has increased over a period of time. For example, it was 2.8 per cent in 1980-81, and increased to 7.9 per cent during 2000-2001 and 5.5 per cent during 2001-2002. Even though the share of medical and public health increased in the total outlay, in the total expenditure it remained static between 1.5 per cent and 3 per cent during 1980-81 to 1997-98. The recent period, particularly after 1998-99, has witnessed a slight increase in the percentage of spending on medical and public health, ranging between four to five per cent of the total expenditure.



Source: Various volumes of *Statistical Abstract, Punjab*

Figure 4 shows the proportions of total expenditure to total outlay during the different annual plans on MPH and Social Services other than MPH. Except during the three annual plans, i.e. 1982-83, 1990-91 and 1996-97, the proportion of expenditure to total outlay on MPH has always been less than that on social services other than MPH. This clearly shows that MPH was given a lesser priority than other social services.



Source: Various volumes of *Statistical Abstract, Punjab*

HEALTH INFRASTRUCTURE AND SERVICES

It is now well known that Punjab, like all other states, has made significant improvements in bringing down the crude death rate (CDR), infant mortality rate (IMR), and in bringing up the standard of living and expectancy of life at birth. Moreover, significant improvements in the control of various communicable and non-communicable diseases, such as diphtheria, poliomyelitis, tetanus (both neonatal and others), whooping cough, measles, leprosy, malaria, tuberculosis, goitre, blindness, etc., are well known.

In Punjab, health services (comprising of preventive, promotive and curative) are provided through the Department of Health and Family Welfare. Since primary health care is the first and the nearest contact between the individual and health care services, Punjab, like many other states of India, has made intensive provisions for primary health care services through a network of Sub-Centres (SC), Subsidiary Health Centres (SHCs), Primary Health Centres (PHCs) and Community Health Centres (CHCs). To support these primary health care services, provisions have been made for secondary-level health care facilities through sub-divisional and district hospitals. Further, tertiary-level health care facilities in the form of specialized hospitals and hospitals attached to the state medical colleges, have been provided for to support the secondary-level health care services. These institutions, besides extending support to secondary-level health care systems, are expected to carry out research and manpower development for the health services of the state.

Availability of Health Institutions

At the time of independence, there was only one medical college at Amritsar. A medical college was established during the First Plan at Patiala. In 1966, there were only 496 medical institutions and the average population served per institution improved only marginally from 24,729 in 1962 to 24,538 in 1966¹². In 1966, Amritsar, Kapurthala, Ludhiana and Patiala districts were in the lead in the availability of medical facilities, whereas Gurdaspur, Ferozepur, Hoshiarpur, Bhatinda and Sangrur districts were backward. The average radius served per institution showed that the medical facilities were comparatively inadequate in Ferozepur, Bhatinda and Sangrur districts.¹³

Punjab has taken rapid strides in the promotion of health infrastructure services. Today, it has 2,852 Sub-Centres, 1,465 Subsidiary Health Centre (each having a medical officer and a pharmacist), 484 PHCs, 117 Community Health Centres, three medical and two dental colleges along with attached hospitals. In addition, 40 mobile dispensaries have been provided for intensive health care to serve the population living within 16 km of the international border. There are 230 Allopathic hospitals in the state. They range from 50-beds hospitals in smaller towns to larger hospitals attached to the five medical colleges, one each at Patiala, Faridkot and Amritsar and two at Ludhiana with facilities for dealing with complicated cases and acting as referral hospitals and teaching colleges. To promote the Indian system of medicines and homeopathy (ISM&H), there are 473 Ayurvedic dispensaries, 17 Ayurvedic Swasthya Kendras, five 10-bedded Ayurvedic hospitals (one each at Jalandhar, Bathinda, Ludhiana, Hoshiarpur and Amritsar), one government Ayurvedic college at Patiala, 105 Homeopathic dispensaries,

¹² *Draft Outline Fourth Five Year Plan Punjab State*, Planning Department, Government of Punjab, p. 73

¹³ *Ibid.* p. 75.

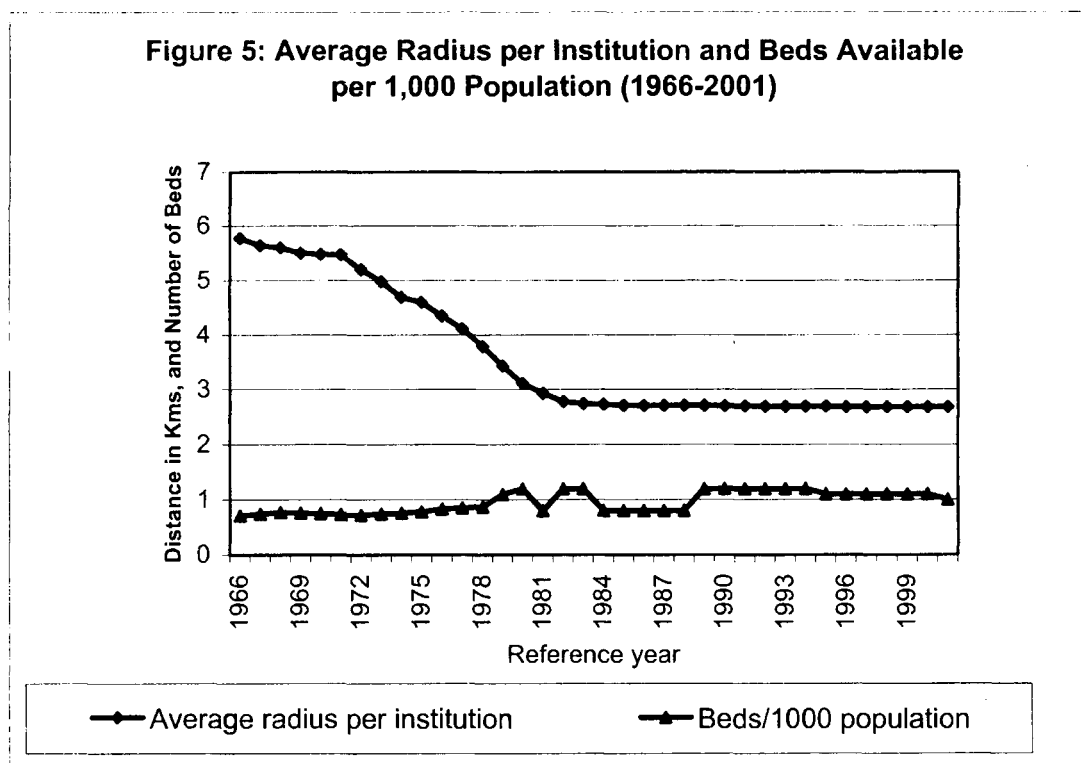
and 34 Unani (Arab/Persian medical system) dispensaries in the state. The state has one doctor for every 1,470 of the population, and one hospital bed for every 864 people -- ratios that are probably the best in the country.

Development of Health Infrastructure (1966-2001)

The following figures highlight some of the significant changes that have occurred in the development of the health infrastructure in the state since 1966.

Radius covered per Institution/Beds Available per 1000 Population

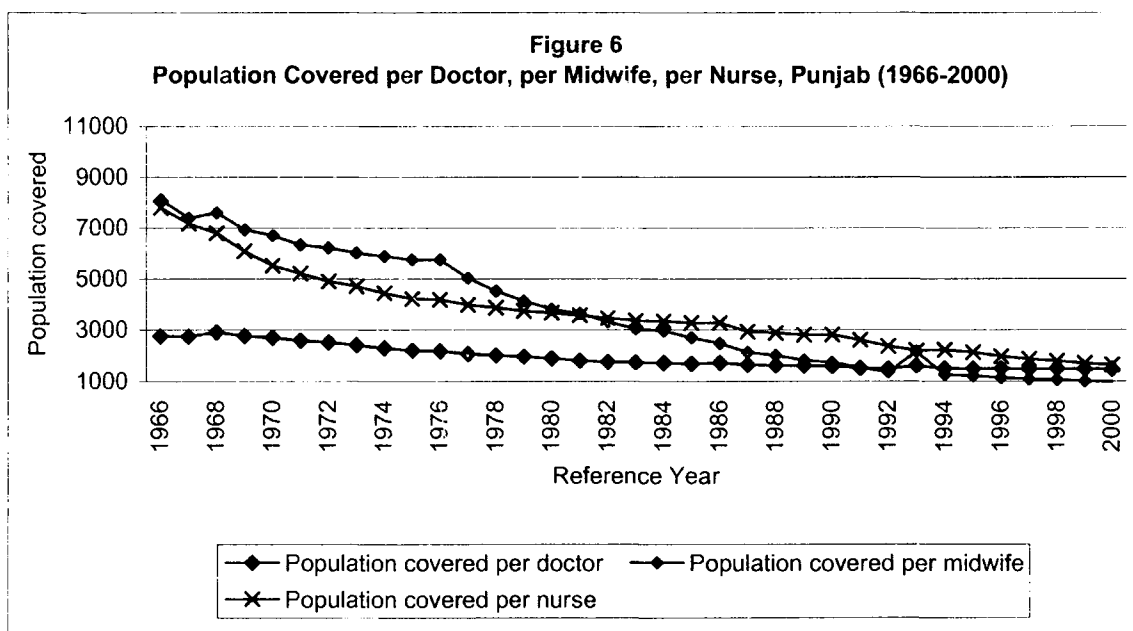
There has been remarkable improvement in the availability of health institutions, number of beds, doctors, midwives and nurses during 1966 to 2000. As revealed in Figure 5, the average radius covered was 5.8 km per health institutions in 1966, which has been reduced to 2.7 km in 2001. Similarly, in 1966, beds available per 1,000 of population were 0.7, which increased to 1.1 during the year 2001. The numbers of additional beds provided in hospitals, however, were compensated by the increase in population during these years.



Source: Various volumes of *Statistical Abstract*, Punjab

Manpower Availability

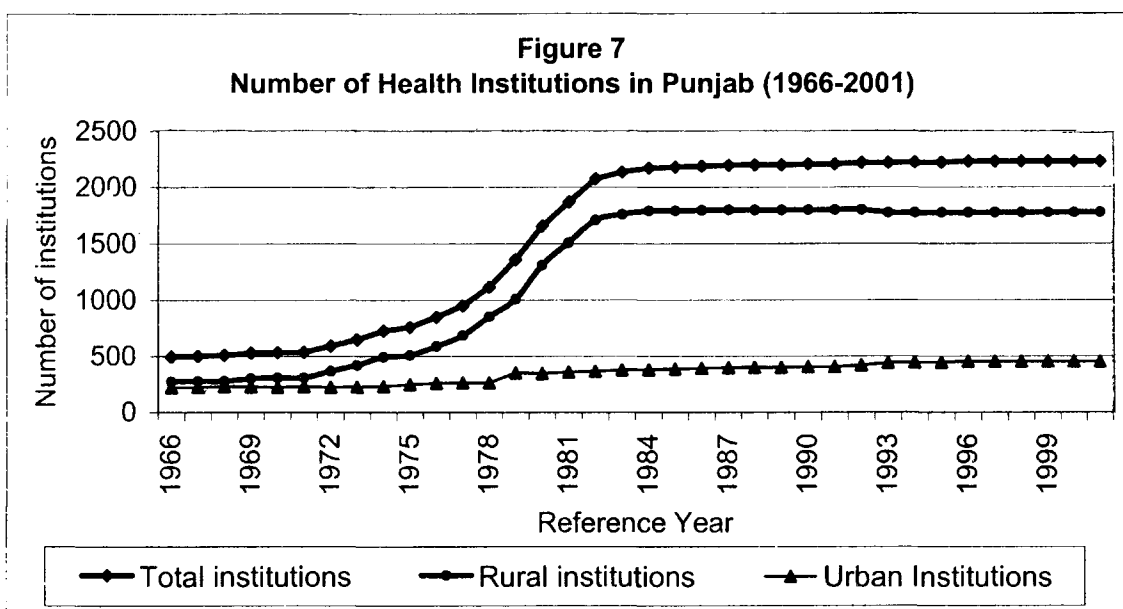
Figure 6 shows that there has been a tremendous increase in the availability of medical and para-medical manpower during 1966-2001. For instance, in 1966, the population covered per doctor was 2,758, per midwife 8,119 and per nurse 7,797, which declined to 1,470, 982 and 1,636 respectively during 2001. In fact, there has been a consistent increase in the availability of manpower (both medical and para-medical) in the state.



Source: Various volumes of *Statistical Abstract*, Punjab

Growth of Health Institutions

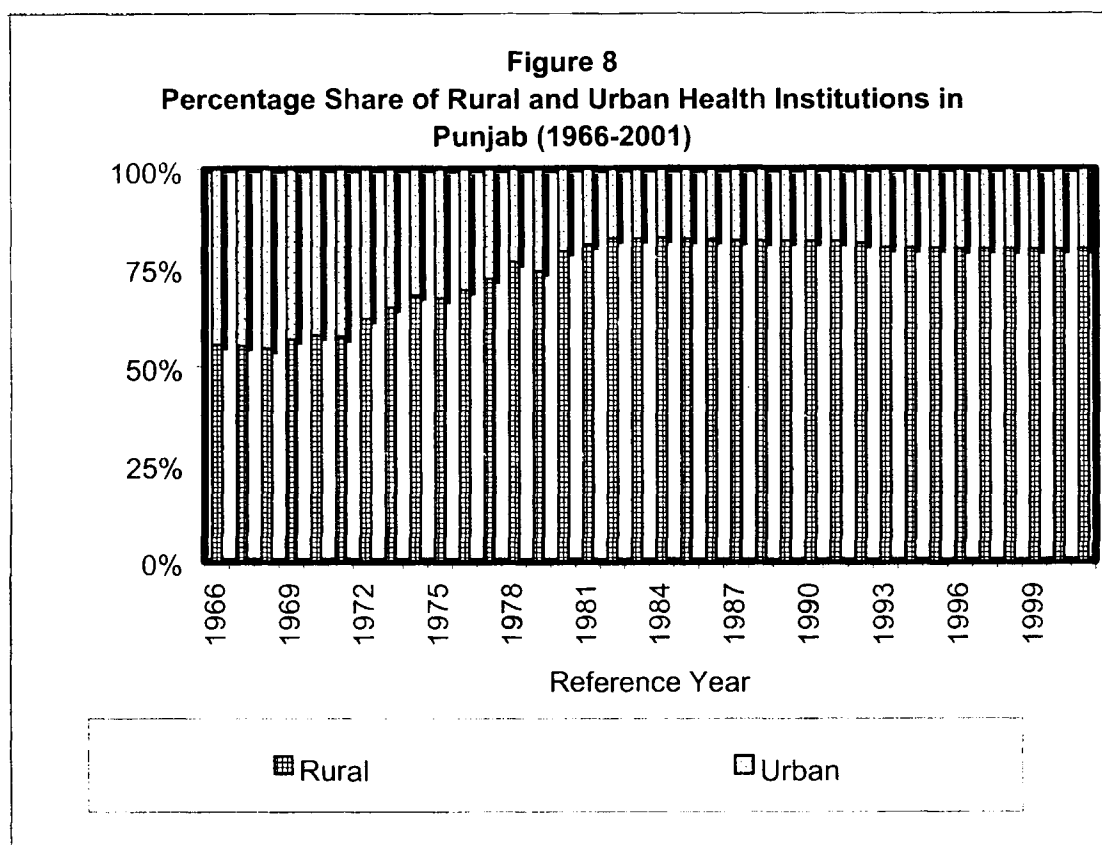
The availability of health institutions in the state increased 4.5 times (6.5 times in rural areas and two times in urban areas) between 1966 and 2001 (Figure 7). In absolute terms, the total number of institutions rose from 496 in 1966 to 2,229 in 2001, the rural health institutions in the state rose from 275 to 1,777 during the same period, and the urban health institutions from 221 to 452 during 1966-2001. There was considerable increase in the number of rural health institutions during 1973-83, the period during which Sub-Centres and SHCs were set-up by the Government of Punjab on the recommended of the Government of India. There has hardly been any increase in the number of health institutions since 1985.



Source: Various volumes of *Statistical Abstract*, Punjab

Share of Rural and Urban Institutions

As revealed by Figure 8, the percentage share of rural health institutions was 55.4 per cent among total health institutions in 1966, increased to 64.9 per cent in 1973, 79.1 per cent in 1980, and 81.6 per cent by the year 1990. During the 1990s, there was some additional emphasis on urban infrastructure. As a result, the share of urban health institutions increased slightly from 18.4 per cent to 20.3 per cent.

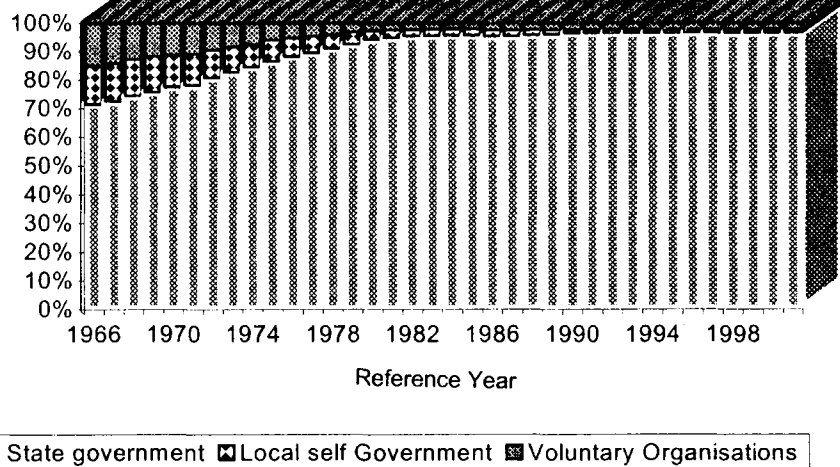


Source: Various volumes of *Statistical Abstract, Punjab*

Health Institutions by Ownership

The percentage share in the number of health institutions by ownership among the state government, local self-governments and voluntary organizations (Figure 9), decreased sharply for the last two categories. In fact, the local self-government has completely withdrawn from the health sector. For example, the respective shares of the three sectors were 71.6 per cent, 13.3 per cent and 15.1 per cent in 1966, which changed to 96.6 per cent, 1.1 per cent, and 2.3 per cent respectively in 2001. Thus, during the last 37 years, local self-government and voluntary organizations have withdrawn from the health sector.

Figure 9
Percentage Share of Institutions by Type of Ownership (1966-2001)

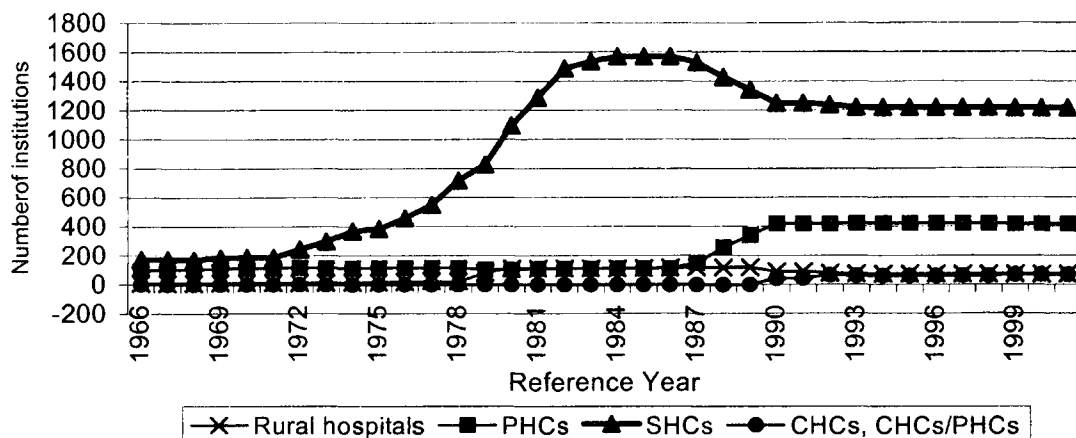


Source: Various issues of *Statistical Abstract*, Punjab

Growth of Rural Health Institutions

If we look at the growth of rural health institutions, it is clear that during all these years, there has been an emphasis on the opening up of newer dispensaries in the state (Figure 10). The growth of rural hospitals took place during 1978-80. Their number increased from 23 in 1978 to 79 in 1979 and to 111 in 1980. Their number remained more or less stagnant up to 1989, and then started decreasing, as many of them were accorded the status of Community Health Centres (CHCs), according to the revised guidelines of the Government of India. Likewise, earlier there was one PHC per block in Punjab, but in response to the revised criterion of one PHC per 30,000 population, many rural dispensaries have been given the status of PHCs since 1987. As a result, while the number of PHCs has increased, that of SHCs has decreased. Most of these PHCs continue to be known as Mini PHCs in Punjab, with inadequate infrastructure facilities and without drawing and disbursing powers (DDO) powers and operated by a single medical officer.

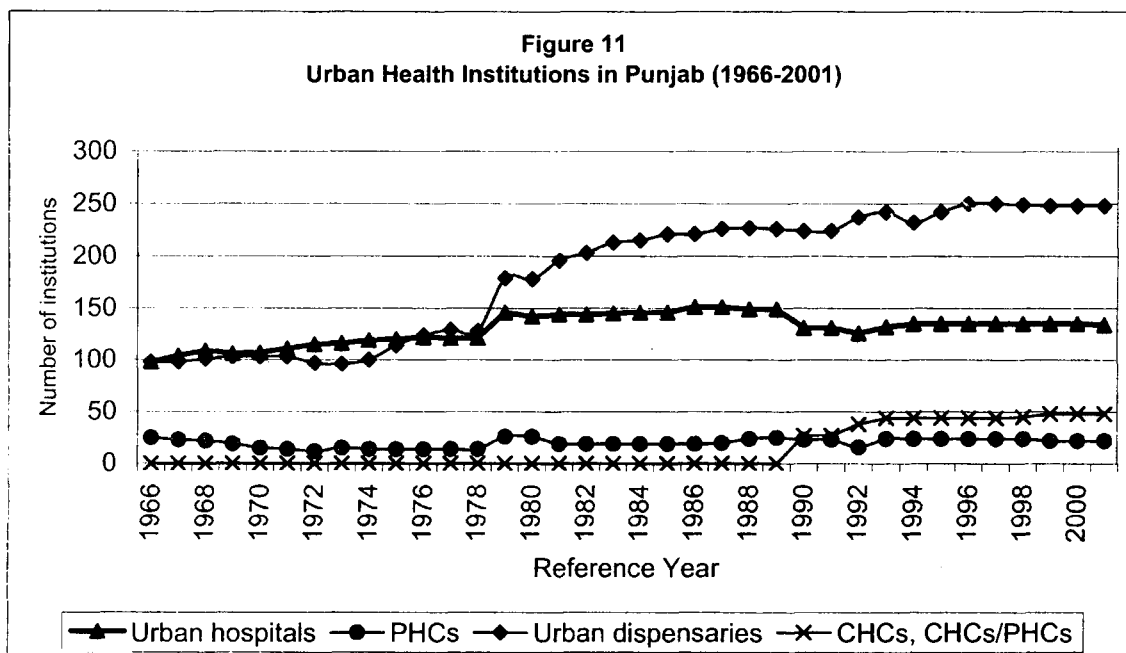
Figure 10
Rural Health Institutions in Punjab (1966-2001)



Source: Various volumes of *Statistical Abstract*, Punjab

Growth of Urban Health Institutions

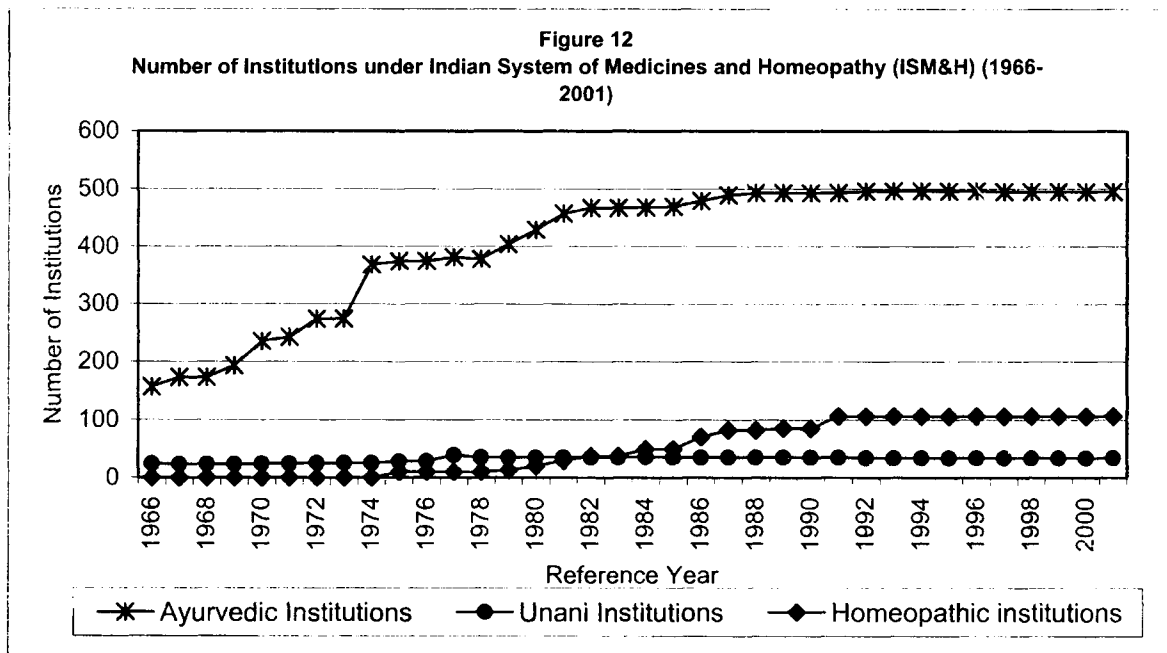
Urban health institutions have not kept pace with the rising urbanization in the state. As regards the growth of urban health institutions, the number of urban hospitals has increased only slightly from 106 in 1970 to 134 in 2001. Urban PHCs too have remained more or less static during the recent years. The only significant increase has been in the number of urban dispensaries, which increased from 98 in 1966 to 248 in 2001, an increase of 2.5 times (Figure 11).



Source: Various volumes of *Statistical Abstract*, Punjab

Growth of Health Institutions under Indian System of Medicines and Homeopathy (ISM&H)

During 1966-2001, minor importance has been given to the development of health institutions under the alternative system of medicines, popularly known as Indian System of Medicines and Homeopathy (ISM&H). Figure 12 shows that the number of ayurvedic institutions increased from 157 in 1966 to 495 in 2001. The major growth of ayurvedic health institutions took place during 1970-1984. There has been no emphasis on the Unani system of medicines. Slightly more emphasis was given to homeopathy during 1986-1992. The data clearly reflect that the efforts to develop ISM&H have not been as focused as it should have been.



Source: Various volumes of *Statistical Abstract*, Punjab

Private Health Institutions in the State

The private health sector plays a crucial role in the health delivery system. With a wide network of services, it caters to the needs of both rural and urban populations and has expanded considerably to meet increasing demands. The total health expenditure in India is estimated to be about six per cent of GDP, of which private health care expenditure is 75 per cent. About, one-third of this expenditure is on secondary and tertiary in-patient care, the rest meet the curative needs at the primary level. Insurance coverage mechanisms are negligible and most of this expenditure is out of pocket. For each one per cent increase in per capita income, private health care expenditure has increased by 1.47 per cent. About 57 per cent of hospitals and 32 per cent of hospital beds are in the private sector. At present, about 80 per cent of 3,90,000 allopathic doctors registered with medical councils in India are working in the private sector. Moreover, there are over 6,50,000 providers of other systems of medicines practicing in India and most of them come under the private sector. Utilization studies show that one third of the in-patients and three-quarters of out-patients utilize private health care facilities.¹⁴ Punjab has an abundance of private health care institutions and practitioners, but despite playing such an important role, no information as to the actual number of private hospitals and clinics is available with the Government of Punjab, as there is no provision for it. Registration is not required for starting a hospital, a nursing home, or private practice.

¹⁴ Ramesh Bhat, 'Characteristics of Private Medical Practice in India: A Provider Perspective', *Health Policy and Planning*, Volume 14 (1), Oxford University Press, 1999, p. 26-37.

Maternal and Child Health Referral Services

Efficient maternal and childcare services include immediate referral services to the first referral units, which can reduce infant mortality rate and maternal mortality rate considerably. The mid-term appraisal of the Ninth Five Year Plan (1997-2002) also iterates the need to obtain and analyze information on health care infrastructure and manpower.¹⁵

A perusal of Table 3 reveals that there is need for more specialized childcare hospitals in Punjab. The Ninth Plan suggested that in all government hospitals in urban areas in-patient facility for maternal care services should constitute four out of ten beds for maternity care.

Table 3
Institutions Providing Specialized Medical Services

Specialized services/Type of management	Total number of institutions		Number of beds	
	Hospital	Ward	Hospital	Ward
Pediatrics	1	115	100	1047
State public	0	108	100	817
Voluntary organizations	0	6	0	170
State special	0	1	0	6
Services available for deliveries, complications of pregnancy, child birth and puereperium	14	68	742	2063
State public	5	57	72	1632
Voluntary organizations	6	5	250	345
State special	0	6	0	86
Municipal	3	0	420	0

Source: *Directory of Medical Institutions in Punjab State as on 1-4-1995*, Series No. 8, Publication No. 26, Directorate of Health and Family Welfare, Punjab, Chandigarh.

MORBIDITY PATTERNS IN PUNJAB

Health experts find serious errors in the data recording information related to morbidity. Despite this limitation, this section attempts to highlight some of the morbidity patterns in Punjab as revealed by surveys undertaken during different rounds of the National Sample Survey Organization (NSSO), and the Health Care surveys undertaken by the National Council of Applied Economic Research (NCAER).

¹⁵ *Mid-Term Appraisal of Ninth Five Year Plan (1997-2002)*, Planning Commission, Government of India, New Delhi, October 2000, p.247.

Incidence and Prevalence of Morbidity

NSS 28th Round (October 1973-1974) defines morbidity as sickness that includes injury and poisoning and means any deviation from the state of physical and mental well-being with a specific cause. The survey did not treat chronic events as morbidity. It estimated both the incidence rate¹⁶ (frequency of morbidity commencing during the reference period, started and ended during the reference period) and prevalence rate¹⁷ (frequency of morbidity prevailing in the reference period). Table 4 shows that Punjab had higher incidence and prevalence rates of morbidity than all-India for both rural and urban areas. No variations by residential status of households were reported in the incidence and prevalence rates of morbidity at the all-India level, but greater morbidity (both incidence and prevalence) was reported in rural than in urban areas of Punjab.

Table 4
Incidence and Prevalence Rates of Morbidity per thousand Persons

State/country	Incidence rate		Prevalence rate	
	Rural	Urban	Rural	Urban
Punjab	19.3	16.7	27.5	24.6
All India	12.6	13.5	22.5	22.8

Source: 'NSS 28th Round', *Sarvekshana*, Volume IV, No. 1 & 2, 1980.

Household Survey of Medical Care (NCAER, May-June 1990) covered a sample of 8,417 households from 34 villages in 12 districts to study morbidity patterns in Punjab. It classified illnesses by various socio-economic characteristics of the households, such as sex, income, education and occupation. Classification of all household illness-episodes revealed that the prevalence rate was higher among males and boys than among females or girls in both rural and urban areas of Punjab and all-India. While all-India trends show a declining morbidity with increase in income, Punjab does not. Similarly, education has not had much impact on morbidity patterns, except that reporting of illnesses was less among the illiterates, or not formally educated, in both rural and urban areas of Punjab. In rural areas, businessmen, including petty shopkeepers, reported maximum morbidity than the other occupational groups. Urban areas did not show any such trend (Table 5).

¹⁶ Estimated number of spells (started and terminated during the reference period + started during the reference period and continued in the survey)/estimated population exposed to risk * 1000

¹⁷ Estimated number of spells (started before the first day of the reference period + started and terminated during the reference period + started during the reference period and continued in the survey + started before the first day of the reference period and continued on the last day of survey)/estimated population exposed to risk * 1000

Table 5
Prevalence Rate of Illnesses by Socio-economic Characteristics (per 1000 Persons)

Socio-economic characteristics	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Sex				
Males	58.4	105.3	61.2	88.1
Females	23.9	59.8	34.0	46.6
Boys	47.4	93.9	79.4	90.8
Girls	7.1	45.7	33.4	40.5
Annual income				
Low income (< 12,000)	25.0	87.4	67.1	77.2
Middle income (12,500-56,000)	48.8	65.7	43.4	63.1
High income (> 56,000)	18.0	47.2	45.7	57.6
Education				
No formal education	27.8	74.9	25.9	69.7
Primary	25.2	84.8	50.1	65.4
Secondary	56.3	79.1	60.5	70.0
Graduate and others	52.3	78.6	53.2	66.6
Occupation of the head of household				
Cultivators	41.6	71.2	32.4	67.2
Wage earners	28.0	94.0	79.9	66.3
Salary earners	50.8	79.0	51.3	68.2
Professionals	40.3	73.7	55.5	69.3
Artisans	0.0	84.3	45.2	62.5
Petty shopkeepers	79.4	91.0	47.3	67.9
Businessmen	139.3	97.4	18.2	60.1
Others	0.0	73.1	6.3	78.0
Total	37.7	79.1	49.7	67.7

Source: NCAER, *Household Survey of Medical Care*, May-June 1990

NCAER (1993) survey of health care utilization and expenditure also measured the prevalence rate of illnesses. It pointed out that the prevalence rate of illnesses per 1,000 persons was much higher in Punjab than the national average (132.0 in rural areas in Punjab as compared to 106.7 in India, and 175.4 in urban areas of Punjab as compared to 103 in India). The survey also indicated some sex-wise rural-urban differentials. For instance, the prevalence rate of illnesses was much higher among rural males in Punjab than in India (155.8 per 1,000 as against 105.5 per 1,000). It was also much higher for both males and females in urban areas of Punjab than the national average. The percentage of illness episodes treated was also much higher in Punjab than in India (Table 6).

Table 6
Prevalence Rate and Treatment of Illness by Area and Sex (per 1000 Persons)

Sex	Rural areas				Urban areas			
	Punjab		India		Punjab		India	
	Prevalence of illness	Percent treated	Prevalence of illness	Percent treated	Prevalence of illness	Percent treated	Prevalence of illness	Percent treated
Males	155.8	100.0	105.5	88.1	120.6	95.0	98.2	92.4
Females	106.4	98.2	108.1	88.4	175.4	94.2	108.4	90.9
Total	132.0	99.3	106.7	88.2	175.4	92.3	103.0	91.7

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995.

Classification of Illnesses

NSS 28th round survey revealed that more people suffered from chronic diseases with increase in age in both the rural and urban areas of Punjab. Such chronic morbidity was more prevalent among males in rural areas and among females in urban areas. Asthma, piles, rheumatism, bronchitis, tuberculosis, epilepsy, kidney stone or kidney trouble and high blood pressure were the common chronic diseases suffered by the people of Punjab in both rural and urban areas (Table 7).

Table 7
Number of Persons Suffering from Chronic Diseases in Punjab by Age, Sex and Residential Status (per 100000 Persons)

Characteristics	Punjab (Rural)			Punjab (Urban)		
	M	F	P	M	F	P
Age-group						
0-14	247	269	257	473	334	405
15-24	759	900	827	416	607	502
25-44	2459	3503	2970	1724	2342	1998
45-59	6689	5772	6238	4097	7042	5513
60+ above	9717	6708	8458	8036	7326	7718
Not recorded	-	-	-	-	-	-
All ages	2348	2197	2277	1621	1993	1794
By type of chronic disease						
Tuberculosis	102	130	115	75	107	90
Leprosy	-	-	-	56	65	60
Syphilis	45	22	34	19	21	20
Cancer	13	-	7	-	43	20
Thyroid trouble or Goiter	13	7	10	19	62	40
Diabetes	13	50	30	37	22	30
Mental illness	51	50	51	19	43	30
Epilepsy	70	58	65	37	21	30
Rheumatic fever	26	65	44	-	-	-
High blood pressure	45	123	81	130	215	169
Bronchitis	102	86	95	130	86	110
Asthma	774	468	630	391	407	398
Peptic ulcer	26	72	48	19	43	30
Kidney stone or Kidney trouble	96	72	85	56	-	30
Arthritis	6	14	10	-	22	10
Rheumatism	154	195	173	56	257	149
Stroke	26	14	20	-	-	-
Piles	204	86	149	37	107	70
Others	582	685	630	540	472	508
Not recorded	-	-	-	-	-	-
All types of ailments	2348	2197	2277	1621	1993	1794
No. of sample ailments	367	305	672	87	93	180

Source: 'NSS 28th Round', Sarvekshana, Volume IV, No. 1 & 2, 1980.

Table 8 shows the prevalence rates of illnesses classified under serious communicable diseases¹⁸, acute illness¹⁹ and chronic diseases²⁰ in rural and urban areas in Punjab and India. The prevalence rate of communicable diseases was lower in rural areas and higher in urban areas of Punjab as compared to India. (Influx of migrants from backward states may be one possible explanation for higher prevalence of communicable diseases in urban areas). The prevalence rate of acute illness was higher in both the rural and urban areas of Punjab than in India. (Greater awareness and prompt reporting may be one explanation for this). There were fewer patients with chronic diseases in rural areas and additional patients with chronic diseases in urban areas of Punjab than in India. (Life-style and dietary patterns in urban areas might have contributed to this). The average duration of illness for communicable and acute illnesses in rural Punjab for both males and females was higher than in rural India. The duration in urban areas was somewhat same for Punjab and India. This seems to indicate that the rural people of Punjab are not getting proper treatment for their illnesses as compared to their counterparts in other rural areas of the country and the urban areas of the state.

Table 8
Prevalence Rate of Illness Classified by Type and Duration of Illness (per 1000 Persons)

Type and duration of illness	Rural		Urban	
	Punjab	India	Punjab	India
Type of illness				
Serious communicable diseases	12.9	15.6	18.1	14.0
Acute illnesses	111.1	77.9	105.6	70.6
Chronic diseases	7.9	13.2	22.2	18.4
Total	132.0	106.7	145.8	103.0
Average duration of illness (in days) (for communicable and acute illness only)				
Male	14.0	11.4	9.2	10.4
Female	12.2	10.1	9.5	9.8
Total	13.2	10.8	9.3	10.1

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995.

The 52nd round of NSS on morbidity and treatment of ailments also showed that the prevalence of morbidity was higher in Punjab than in India. For instance, prevalence of acute illness was 56 per 1,000 in rural areas of Punjab against 42 per 1,000 in rural areas of India; figures for chronic illness were 20 per 1,000 as against 13 per 1,000 respectively. Similarly, prevalence of acute and chronic illnesses was higher in urban areas of Punjab than in India. The number of persons reporting ailments (acute or chronic) usually increases with the increase in age in Punjab as well as in India. Chronic illnesses are generally prevalent among persons who are 40 years or older. Classification of data by sex and residential status did not show much difference in the prevalence rate of acute or chronic diseases (Table 9).

¹⁸ Communicable diseases include typhoid, malaria, cholera/acute gastro-enteritis, jaundice, chicken pox, measles, mumps and tuberculosis.

¹⁹ Acute illnesses include diarrhoeal diseases, respiratory infections, non-specific fever, skin-diseases, eye/ear problem, headaches/bodyaches/backaches, stomach problems--indigestion, gas acidity and constipation.

²⁰ Chronic diseases include aches and pains (arthritis and rheumatism), cardio-vascular diseases (heart-ailments/hypertension), diabetes, kidney problems, breathing problems, asthma, cancer, weakness/dizziness, anaemia, mental and psychological disorders, and others.

Table 9
Acute and Chronic Ailments Classified by Age and Sex (per 1000 Persons)

Age-Group	Rural areas						Urban areas					
	Punjab			All-India			Punjab			All-India		
	Acute	Chronic	Any	Acute	Chronic	Any	Acute	Chronic	Any	Acute	Chronic	Any
Male												
0-14	70	6	76	46	3	50	81	5	85	51	3	54
15-39	47	7	54	27	8	35	65	10	75	28	7	35
40-59	40	26	66	42	22	64	44	33	77	36	24	61
60+	73	97	171	95	86	178	71	123	194	65	85	148
All	55	15	71	41	13	54	67	17	84	39	13	51
Female												
0-14	46	4	50	43	3	45	57	6	64	47	3	49
15-39	55	16	69	36	9	45	47	25	72	37	9	45
40-59	73	53	126	48	27	75	46	75	120	42	31	73
60& above	74	107	181	90	73	161	96	153	242	73	94	166
All	57	25	81	44	14	57	52	34	86	43	15	58
All												
0-14	59	5	64	45	3	48	71	6	76	49	3	52
15-39	51	11	61	32	9	40	57	17	73	32	8	40
40-59	56	39	95	45	24	69	45	52	96	39	27	66
60+	73	102	176	93	80	170	83	137	217	69	89	157
All	56	20	76	42	13	55	60	25	85	41	14	54
No. of ailing persons												
Estimated (00)	7716	2755	10406	26977	84301	352625	3778	1572	5331	82712	28141	110527
Sample	748	294	1038	16511	5321	21732	494	270	763	9855	3862	13675

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

Morbidity, Level of Living and Social Groups

Table 10 shows the relationship between reporting of morbidity and level of living as measured by monthly per capita consumption expenditure (MPCE). A positive association between MPCE and PAP (proportion of ailing persons) is observed in both rural and urban areas of India, PAP being higher in rural than in urban areas. In Punjab, no such relationship was observed. Reporting of ailments was generally higher for general castes than Scheduled Castes.

Table 10
Number of Persons Reporting Ailments During a Period of 15 Days per 1,000 Persons by Fractile Groups of MPCE and Social Groups: Type of Ailment: Any

Mpce and social groups	Rural areas						Urban areas					
	Punjab			All-India			Punjab			All-India		
	Male	Fe-male	Per-sons	Male	Fe-male	Per-sons	Male	Fe-male	Per-sons	Male	Fe-male	Per-sons
Mpce fractile groups												
0-10	87	58	73	44	40	42	26	33	29	42	40	41
10-20	93	45	62	40	39	40	44	41	42	42	47	45
20-40	83	53	68	45	49	47	82	85	84	47	55	51
40-60	58	48	54	50	55	52	55	58	56	50	55	52
60-80	67	80	73	56	62	59	82	92	87	51	65	57
80-90	65	78	71	66	72	69	70	100	83	58	76	66
90-100	76	93	84	83	91	86	158	136	149	71	71	71
All	71	81	76	54	57	55	84	86	85	51	58	54
Social groups												
ST	-	129	72	42	43	42	266	146	227	42	47	45
SC	71	71	71	52	55	54	81	51	67	49	57	53
Others	71	88	79	56	60	58	81	98	89	52	59	55
No. of ailing persons												
Estima-Ted (00)	5139	5267	10406	175224	177401	352625	2858	2473	5331	54264	56263	110527
Sample	515	523	1038	10832	10900	21732	383	380	763	6767	6908	13675

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

Table 11 shows the number of persons who reportedly received medical treatment for ailments. It is evident that medical treatment of ailments was much higher in Punjab in both rural and urban areas than in India among all the age groups. While figures for treated episodes was higher for males, the picture in Punjab was much better than in India in terms of different age groups and sex. In most of the categories, a direct relationship exists between the MPCE and number of episodes receiving treatment. No such trend is noticeable in Punjab. Among the social groups, the Scheduled Caste population was slightly less active in availing treatment for ailments in rural areas, and vice versa for general population in urban areas.

Table 11
Number of Persons Classified by Age, Sex, MPCE and Social Groups Reportedly Receiving Some Medical Treatment for Ailments (Per 1000 Ailing Persons) (type of ailment: any)

Socio-economic characteristics	Rural areas						Urban areas					
	Punjab			All-India			Punjab			All-India		
	M	F	P	M	F	P	M	F	P	M	F	P
Age-groups												
0-14	996	980	990	850	832	842	942	938	940	934	910	903
15-39	998	995	996	861	839	849	964	977	970	903	919	927
40-59	999	999	999	831	813	822	1000	975	986	897	905	904
60+	976	943	959	788	748	769	990	964	976	891	915	872
All	994	986	990	838	816	827	965	965	965	910	855	907
Mpce fractile group												
0-10	1000	1000	1000	724	759	741	1000	1000	1000	820	807	813
10-20	1000	1000	1000	790	755	773	1000	634	820	878	863	870
20-40	916	1000	949	825	783	803	993	934	964	909	895	902
40-60	1000	931	972	830	794	812	959	982	970	920	905	912
60-80	998	993	995	838	823	830	944	978	960	928	918	923
80-90	997	989	993	868	852	860	994	1000	997	962	946	954
90-100	997	986	992	915	894	905	963	956	961	898	933	914
All	994	986	990	838	816	827	965	965	965	910	903	907
Social groups												
ST	-	1000	1000	801	766	784	1000	940	988	878	925	902
SC	988	985	987	837	827	832	978	954	969	939	895	916
Others	998	987	992	842	818	830	958	968	963	907	904	905
No. of ailing persons												
Estimated(00)	5109	5194	10303	146793	144753	291546	2759	2387	5147	49405	50820	100525
Sample	506	510	1016	8960	8807	17767	371	371	743	6138	6211	12349

Source: 'NSS, 52nd Round (July 1995-June 1996)', Morbidity and treatment of ailments, NSSO, Department of Statistics, Government of India, November 1998.

Note: M- Males, F-Females, P-Persons

Reasons for Untreated Episodes of Illness

Table 12 shows the percentage distribution of untreated episodes of sickness classified by reasons for non-treatment. A large majority of households (83% in rural areas and 93% in urban areas) reported that treatment was not sought since the ailments were not considered serious. Financial reasons were cited by very few (6% in rural areas and 2% in urban areas in Punjab as compared to 15% and 10% respectively at the all-India level).

Table 12
Distribution of Untreated Spells of Sickness Classified by Reasons for Non-Treatment (in Percent)

Reasons for no treatment	Rural		Urban	
	Punjab	India	Punjab	India
No medical facility	1.29	2.86	-	0.13
Lack of faith in system of medicines	3.09	1.93	1.96	1.81
Long waiting	-	0.33	-	1.05
Financial reasons	6.24	15.27	2.09	9.57
Ailments not considered serious	82.66	74.61	93.18	81.13
Other reasons	6.72	5.00	2.77	6.31
All	100.0	100.0	100.0	100.0

Source: 'NSS, 42nd Round', Morbidity and Utilization of Medical Services, July 1986-June 1987

HEALTH-SEEKING BEHAVIOUR/UTILIZATION OF HEALTH CARE SERVICES

Health-seeking behaviour or utilization of health care services is influenced largely by the access to health facilities, individual and family beliefs and attitudes related to illness and the system of medicines, cost of treatment and individual capacity to pay. The following section is an attempt to analyze the health-seeking behaviour in the context of preventive and curative health care services for non-hospitalized (outdoor) and hospitalized (indoor) episodes of illnesses and the related behavioral aspects grouped by socio-economic factors, type of treatment preferred, choice of public/private or voluntary sector, and the cost of treatment.

Preventive and Curative Services by Source of Treatment

Table 13 sums up the role of public and private sector for the provision of contraceptive, preventive and curative services. It clearly shows that public sector essentially plays a crucial role in providing preventive services for contraception and immunization, but the private sector dominates in provision of curative services or institutional deliveries. The table clearly shows that the private sector caters more to the urban population than to the rural population. It shows that 88 per cent of all children (93% in rural areas) received vaccinations from the public sector. The survey revealed that the share of the private health sector in immunization has a direct relationship with urbanization, mother's education (at least high school), caste (higher share in general caste), and households with a high standard of living. As for curative services, the table shows that a large majority of households (86%) in Punjab normally visits the private medical sector. Its use is much higher in Punjab (86%) than in the country as a whole (69%). Overall, three types of health providers are generally used as a source of treatment by almost all the households. Forty-seven per cent households preferred treatment from private doctors, 38 per cent from private hospitals and clinics, and nine per cent from government/municipality hospitals. Moreover, the pattern of service utilization is similar for both rural and urban areas. The type of health care services used is influenced only slightly by the standard of living of the households concerned. The private sector is the dominant health care service provider for households of all standards of living, with 81 per cent of even households with a low standard of living usually relying on this sector for health care when a household member falls ill. Use of government dispensaries as a source of care declines sharply from nine per cent among households with a low standard of living to only two per cent among households with a high standard of living. Likewise, more people visit private nursing homes than government hospitals for institutional deliveries (29.6% as against 7.6% of the total deliveries).

Table 13
Share of Public and Private Sector in Contraceptive, Preventive, and Curative Services
(in Percent)

Type of service	Share of public sector			Share of private sector		
	Rural	Urban	Total	Rural	Urban	Total
All contraception	75.2	40.3	64.3	18.5	45.4	26.9
Male sterilization	100.0	100.0	100.0	0.0	0.0	0.0
Female sterilization	98.0	88.2	96.1	1.8	11.2	3.6
IUD	53.0	35.5	45.3	47.0	64.5	54.7
Oral Pills	28.1	16.7	24.5	62.6	69.8	64.9
Condoms	14.6	5.9	10.0	53.4	63.0	58.5
Childhood vaccination	92.7	72.3	87.5	6.7	27.7	12.0
Percent share in institutional delivery	7.1	9.3	7.6	24.5	46.8	29.6
Usual source of Health care	14.2	13.0	13.8	85.5	86.6	85.9

Source: *National Family Health Survey-2, Punjab, India 1998-99*

Note: The totals will not add up to 100 due to the presence of other categories

Type of Treatment Preferred for Non-Hospitalized Illnesses

The household survey of health care utilization and expenditure (NCAER, 1993) points out that for non-hospitalized illness episodes, Allopathic treatment is the most preferred form of treatment in both rural and urban areas of Punjab. Table 14 highlights the fact that the allopathic system of medicine is preferred more in Punjab than in the country as a whole. For instance, Ayurvedic/Siddha, Unani methods are preferred by none in rural Punjab, but at the all-India level nearly four per cent households prefer such methods. The reason for not preferring the Indian system of medicine and Homeopathy (ISM&H) is probably the lack of importance attributed to it or its inadequate health infrastructure.

Table 14
Non-hospitalized Illness Episodes by Type of Treatment (in per cent)

System of medicines	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Allopathic	97.3	90.9	94.9	93.2
Homeopathic	1.4	2.0	0.7	2.9
Ayurveda/Siddha	0.0	3.8	2.3	2.2
Unani	0.0	0.2	0.0	0.1
Any combination	1.4	2.0	2.1	1.2
Rituals	0.0	0.6	0.0	0.3
Others	0.0	0.5	0.0	0.2
Total	100.0	100.0	100.0	100.0

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995

Non-hospitalized Illnesses, Source of Treatment and Payment Mechanism

Table 15 shows the distribution of non-hospitalized illness episodes by type of treatment. This is slightly more favourable to the private sector in rural areas both in Punjab and at the all-India level. However, if we look at the health-seeking behaviour of the urban population, the share of public sector in Punjab is much less (18.2% males and 28.8% females) than in India (34.7% males and 33.2% females). People in Punjab believe less in obtaining treatment from a medical shop or store in the adjoining area, which is the usual practice in other parts of India. Moreover, households in Punjab do not believe in going to faith healers or religious persons for treatment.

Table 15
Non-hospitalized Illness Episodes Classified by Type of Treatment (in Percent)

Type of facility	Rural areas				Urban areas			
	Punjab		India		Punjab		India	
	Male	Female	Male	Female	Male	Female	Male	Female
Public facility	42.2	42.6	40.2	43.3	18.2	28.8	34.7	33.2
Private facility	57.8	57.4	54.5	50.8	78.5	69.8	58.9	60.9
Medical shop	0.0	0.0	2.6	3.7	1.5	1.4	5.5	5.0
Faith/healer/ religious person	0.0	0.0	0.7	0.3	0.0	0.0	0.3	0.2
Home remedies	0.0	0.0	2.0	2.0	1.7	0.0	0.7	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995.

The 52nd round (1995-96) of NSSO collected data on the curative aspects of health care system in India and the MCH programme. For Punjab, these are based on a sample survey of 4,216 (2,227 rural and 1,989 urban) households. When compared to the 42nd round data (1986-87), the share of the government sector has fallen drastically during

the two rounds from 12% to 7% and 11% to 6% in rural and urban areas respectively. Though trends at the all-India level too indicate a fall in the share of the government sector, the gap is not as wide as in Punjab (Table 16). The trend is similar at the all-India level, with the exception of rural and urban areas of Andhra Pradesh, urban Bihar and urban Maharashtra. The share of the government sector for management of non-hospitalized illness episodes at all-India level was 2.7 times higher in rural areas and 3.3 times higher in urban areas compared to Punjab according to the recent round. These findings are comparable to NFHS data.

Table 16
Non-hospitalized Ailments Treated by Government Sources (in Percent)

State/Country	Rural		Urban	
	52 nd Round	42 nd Round	52 nd Round	42 nd Round
Punjab	7	12	6	11
India	19	21	20	24

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

NSS 42nd round data also collected information on the payment mechanism. Table 17 shows that less people obtained no-payment treatment or free treatment in both the rural and urban areas of Punjab than in India. Payment was made to government or private institutions by 66 per cent of the households in rural areas in Punjab compared to 46 per cent in India, and by 65 per cent of the households in urban Punjab as compared to 44 per cent in India. From the above data, it can be easily inferred that in Punjab people are willing to pay for the treatment received. The average duration of treatment per episode by source of treatment indicates that the treatment span was a little longer in the rest of India than in Punjab and slightly less in urban areas and in the private sector than in the government sector. (Table 20)

Table 17
Distribution of Treatments (not as an in-patient) Classified by Type of Institution and Payment Category (in Percent)

Payment category/institution	Rural		Urban	
	Punjab	All-India	Punjab	All-India
Payment category				
No payment	29.19	49.14	20.79	42.26
Under employer's medical welfare scheme	4.47	5.21	13.99	13.74
Percent reportedly made payment to institutions				
Government institutions	24.94	12.42	24.66	12.65
Private institutions	41.40	33.23	40.56	31.35
All (Government and Private)	66.34	45.65	65.22	44.00
Total	100.0	100.0	100.0	100.0

Source: 'NSS, 42nd Round', *Morbidity and Utilization of Medical Services*, July 1986-June 1987

Table 18 illustrates the distribution of non-hospitalized cases by the type of treatment and type of medical services (medicines, X-ray, ECG, other diagnostic test, surgery and other treatment). It clearly shows that the distribution was more in favour of the private than the public sector. Less people availed free services from government or other sources in Punjab than in India in all the categories stated above.

Table 18
Distribution of Non-hospitalized Cases (Not treated as In-patients) during the last 15 days by Type of Medical Service and Type of Ward of Government and Other Institution (per 1000 ailments)

Type of medical service	Government				Other				No. of cases treated
	Free	Partly free	Paying	All	Free	Partly free	Paying	All	
Medicines									
Punjab (rural)	6	11	53	70	0	3	927	930	986
India (rural)	60	26	96	182	17	6	796	819	15949
Punjab (urban)	15	3	54	72	8	20	899	927	730
India (urban)	73	20	81	174	20	7	799	826	11472
X-ray, ECG, Scan etc.									
Punjab (rural)	9	-	58	67	12	-	921	933	24
India (rural)	48	9	128	185	39	6	770	815	654
Punjab (urban)	43	-	225	268	3	-	729	732	26
India (urban)	137	11	99	247	42	11	699	752	777
Other Diagnostic Tests									
Punjab (rural)	43	-	20	63	4	-	933	937	47
India (rural)	129	7	66	202	56	38	705	799	1606
Punjab (urban)	77	-	31	108	71	-	821	892	58
India (urban)	138	7	66	211	55	4	731	790	1704
Surgery									
Punjab (rural)	17	-	95	112	21	-	866	887	7
India (rural)	75	1	72	148	77	3	772	852	225
Punjab (urban)	-	-	-	-	5	-	995	1000	7
India (urban)	128	4	51	181	126	6	685	817	211
Other treatments									
Punjab (rural)	149	-	34	183	8	-	809	817	21
India (rural)	165	9	102	276	64	26	635	725	1237
Punjab (urban)	25	-	-	25	5	-	971	976	17
India (urban)	136	11	74	221	72	14	694	780	1041

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998

Hospitalized Illnesses, Source of Treatment and Payment Mechanism

Table 19 shows the distribution of hospitalized cases by type of treatment and payment category. It clearly indicates that lesser number of people visit government sector hospitals both in India and Punjab. Only 26 per cent hospitalized cases in urban areas and 37 per cent in rural areas visited government hospitals in Punjab as compared to 42 and 44 per cent respectively in India. The data also reveals that more people were willing to pay in both rural and urban areas of Punjab than in India.

Table 19
Distribution of Hospitalized Cases (Treated as an In-patient) during Last 365 Days Classified by Type of Ward of Government and Other Hospital and Residential Status of the Household (per 1000 ailments)

Area	Government				Other				No. of cases treated
	Free	Paying General	Paying Special	All	Free	Paying General	Paying Special	All	
Medicines									
Punjab (rural)	235	135	7	377	33	529	17	579	542
India (rural)	388	41	8	438	28	411	91	529	14029
Punjab (urban)	159	102	5	265	28	608	61	696	504
India (urban)	347	55	16	419	35	372	146	553	12497

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

COST OF TREATMENT

It is well established that cost of treatment is an important determinant for the choice of health care. The following section attempts to show the differences in cost of treatment by type of illness (non-hospitalized or hospitalized), system of treatment (allopathic or other) and the socio-economic characteristics of the households.

For Non-hospitalized Illness Episodes

The NSS 42nd round (1986-87) suggests that for non-hospitalized illnesses, the cost of treatment was much less in the private sector than the public sector in both rural and urban areas of Punjab and all-India (Table 20). Outdoor treatment being cheaper in the private sector than in the public sector clearly implies that private sector as such is striving to provide curative services at lesser cost than the public sector. Another possible reason for lesser cost per episode in private sector may be the lesser treatment span in private sector as revealed in the table.

Table 20
Average Total Expenditure Per Treatment by Source of Treatment

Expenditure/duration	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Average total expenditure (in rupees)				
Government	99.09	114.75	92.90	103.39
Private	83.05	84.93	76.61	91.30
Average total duration of illness (in days)				
Government	11.9	13.2	11.8	13.3
Private	10.1	12.2	9.3	11.5

Source: 'NSS 42nd Round', *Morbidity and Utilization of Medical Services*, July 1986-June 1987

NCAER (1990) indicates that the cost of medical treatment was the highest for the Allopathic system of medicines in both India and Punjab (Table 21). However, it was less for Punjab than for India. One surprising factor emerging from this table is that the private sector provides services at a competitive price compared to the public sector. The cost of treatment in the private sector is, however, much higher in both rural and urban areas of India than in Punjab. The table also indicates that the cost of medical treatment increases with the distance covered by the patient. It is usually higher for males and boys than for females and girls in Punjab as well as in India. At least two-thirds of the cost of medical treatment is towards fees and medicines. The costs of clinical tests in rural areas are higher than in urban areas.

Table 21
Average Cost of Treatment per Illness Episode Classified by System of Medical Treatment, Type of Treatment, Distance, Sex (in Rupees), and Break-up of the Medical Expenses (in Percent)

Characteristics	Rural areas		Urban areas	
	Punjab	India	Punjab	India
System of medical treatment				
Allopathic	133.27	167.04	142.53	150.87
Homeopathic	75.41	125.03	108.40	136.26
Ayurvedic	30.69	91.10	74.19	104.16
Rituals	0.00	165.94	0.00	118.09
Self-medication	0.00	18.98	46.99	48.22
Source of medical care				
Government hospitals	119.12	187.32	124.45	123.79
ESI hospitals	-	161.11	140.00	94.88
Private hospitals and clinics	142.28	154.31	131.23	175.21
PHC	37.69	119.38	80.48	120.82
Charitable dispensaries	-	81.82	-	204.99
Medical stores	50.69	130.43	168.73	97.99
Others	6.80	71.13	87.32	115.17
Distance (in Kilometres)				
< 1	77.57	87.05	93.27	111.75
1-2	132.33	98.81	103.57	131.78
3-5	81.83	130.96	236.89	172.47
6-10	78.39	171.71	145.59	288.46
10+	-	274.70	1017.12	421.02
Sex				
Males	114.43	151.79	161.67	159.02
Females	77.27	212.26	121.13	161.00
Boys	78.64	96.59	74.15	99.02
Girls	33.19	87.23	64.43	82.56
Total	98.44	151.81	128.72	142.60
Percent break-up of medical expenses				
Fees and medicines	65.29	65.74	71.02	64.75
Clinical tests	13.14	4.28	3.92	5.79
Surgery	0.00	2.79	0.00	3.01
Hospitalization	5.12	4.45	5.11	4.64
Special diet	9.04	6.42	11.05	7.40
Rituals	0.25	2.27	1.46	1.47
Transport	3.61	6.76	5.36	4.98
Bribes and tips	0.55	1.47	2.19	1.86
Others	3.00	5.82	11.10	6.10
Total	100.00	100.00	100.00	100.00

Source: NCAER, *Household Survey of Medical Care*, May-June 1990.

The NCAER data (Table 22) show the average cost of treatment for non-hospitalized illnesses by systems of and type of medical treatment, distance, sex and per cent break-up of medical expenses. It is evident that the treatment cost for non-hospitalized illness-episodes was slightly higher in a private medical facility than in a public facility. One surprising factor that emerges is that the cost of treatment through a public facility is much higher in Punjab than in India, but through a private facility, it is the other way round. The cost of treatment increases with the increase in distance from the place of treatment in India but it is not so in the rural areas of Punjab. It is higher for males and boys than females and girls in Punjab as well as in India. The table also indicates that fees and medicines alone account for at least two-thirds of the total cost of treatment. Clinical tests are more expensive in both rural and urban areas of Punjab than in India.

Table 22
Average Cost of Treatment per Illness Episode for Non-hospitalized Illnesses Classified by System of Medical Treatment, Type of Treatment, Distance, Sex (in Rupees), and Break-up of the Medical Expenses (in Percent)

Characteristics	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Average expenditure per illness episode for non-hospitalized illnesses				
Males adult	79.75	113.65	91.11	134.08
Females adult	46.91	101.43	143.34	126.40
Male children	85.51	60.06	116.95	77.18
Female children	76.36	44.79	19.74	60.71
Total	70.46	90.48	116.84	113.93
Source of medical care				
Public facility	62.42	49.08	92.23	62.90
Private facility	76.37	130.06	125.27	152.19
Medical shop	-	21.24	89.91	23.02
Faith/healer/religious person	-	65.82	-	77.21
Home remedy	-	8.00	-	14.95
Duration of illness (in days)				
< 5	40.01	32.71	43.21	45.27
6-10	44.57	56.59	49.98	81.62
11-20	86.96	109.95	138.66	163.18
21-30	233.59	176.02	416.46	217.34
>30	125.54	346.93	632.96	385.45
Total	64.58	79.32	110.58	102.51
Distance (in Kilometres)				
< 1	77.57	87.05	93.27	111.75
1-2	132.33	98.81	103.57	131.78
3-5	81.83	130.96	236.89	172.47
6-10	78.39	171.71	145.59	288.46
10+	-	274.70	1017.12	421.02
Percent break-up of medical expenses				
Fees and medicines	66.1	71.3	69.3	77.6
Clinical tests	13.7	4.4	14.0	6.9
Special diet	3.2	8.1	5.7	8.2
Rituals	2.8	0.9	2.2	0.5
Transport	10.4	14.5	6.8	6.5
Bribes, tips and miscellaneous	3.8	0.8	1.0	0.3
Total	100.00	100.00	100.00	100.00

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995.

The survey conducted during the 52nd Round of NSS reveals that the cost of treatment has gone up in the private sector in Punjab as compared to the government sector for non-hospitalized illness-episodes in rural areas, but is still lower than in India. In urban areas of Punjab, the cost of treatment in the government sector is much higher than in India. Some sort of malpractices cannot be ruled out in this regard (Table 23).

Table 23
Average Medical and Other Related Expenditure (for Non-hospitalized illness Episodes) per Treated Illness during the Last 15 Days Classified by Source of Treatment (in Rupees)

Source of treatment	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Government	153	129	205	166
Other	179	186	160	200
All	175	176	162	194

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998

For Hospitalized Illness Episodes

Table 24 clearly indicates that the share of the private sector in hospitalized cases in both rural and urban areas of Punjab is much higher than the all-India figures (47% as against 32% in rural areas and 43% as against 30% in urban areas). Charitable institutions, nursing homes and other non-specified institutions treat five per cent and eight per cent of the hospitalized cases in rural and urban areas of Punjab respectively compared to eight per cent and ten per cent respectively at the all-India level. In Punjab, lesser people avail a free ward for hospitalization. People in Punjab prefer to pay. Ninety-two per cent of the people paid for hospitalization expenses in Punjab in both rural and urban areas as compared to 71 per cent and 67 per cent respectively in India. While 23 per cent and 20 per cent indoor patients in rural and urban areas respectively in India did not pay, only three per cent and one per cent respectively in Punjab did not do so. Data on the average number of days stayed in hospital indicate that rural people stay much longer than their counterparts in urban areas of Punjab. The private sector takes less number of days for treatment than the public sector.

Table 24
Percentage Distribution of Hospitalized Cases by Type of Hospital, Type of Ward for Punjab, All-India

Characteristics	Rural		Urban	
	Punjab	All-India	Punjab	All-India
Type of hospital				
Public hospital	45.46	55.40	48.37	59.51
PHC	2.03	4.34	0.40	0.75
Private hospital	47.14	31.99	43.21	29.55
Charitable institutions run by public trust	1.97	1.71	3.22	1.91
Nursing home	1.66	4.86	2.01	7.04
Others	1.74	1.70	2.79	1.24
Type of ward				
Free	46.30	60.71	46.10	55.22
Paying general	47.55	32.46	41.24	31.79
Paying special	6.15	6.83	12.66	12.99
System of medicines				
Allopathic	99.22	98.50	97.81	98.52
Homeopathic	0.23	0.30	-	0.25
Ayurvedic	-	0.51	1.64	0.42
Unani/Hakimi	0.10	0.22	-	0.28
Any combination of these	-	0.11	-	0.10
Others	0.45	0.36	0.55	0.43
Payment category				
No payment	2.66	23.16	1.02	19.61
Employer's Medical Welfare Scheme	4.95	6.18	7.41	12.95
Reporting payment to institutions	92.39	70.66	91.58	67.44
Average number of days stayed in the hospital by type of hospital and ward				
Government hospitals				
Free Ward	19.78	17.30	17.63	17.49
Paying General Ward	24.29	19.37	16.11	17.03
Paying Special Ward	23.29	22.66	10.52	17.07
Private hospitals				
Free Ward	9.61	11.12	8.30	16.46
Paying General Ward	10.74	12.49	9.22	10.39
Paying Special Ward	15.00	12.98	14.93	13.60
Total	100.0	100.0	100.0	100.0

Source: 'NSS 42nd Round', *Morbidity and Utilization of Medical Services*, July 1986-June 1987.

As against the NSS 42nd round, NCEAR indicates that the distribution of hospitalized cases is more in public facility than in private in both the rural and urban areas of Punjab and India (Table 25). The survey points out that almost the entire rural population (95%) of Punjab is dependent on public facilities for treatment of hospitalized illness-episodes.

Table 25
Percent Distribution of Hospitalized Illness Episodes by Type of Treatment

Type of facility, treatment and distance	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Reported number of hospitalized cases by sex (per '000 persons)				
Male	22.2	8.4	12.4	10.9
Female	5.7	5.5	16.6	8.4
Total	14.2	7.1	14.3	9.7
Distribution of hospitalized cases by type of treatment				
Public facility	95.3	62.0	67.2	60.1
Private facility	4.7	38.0	32.8	39.9
Total	100.0	100.0	100.0	100.0
Average distance traveled for seeking in-patients (in kilometers)				
Public sector facility	9.0	18.6	3.5	5.7
Private sector facility	15.0	18.7	5.4	6.2
All	9.3	18.7	4.1	5.9

Source: NCAER, *Household Survey of Health Care Utilization and Expenditure*, March 1995

NSS 52nd round data (Table 26) indicate that the percentage of beds available in government hospitals is higher than the number of patients treated.

Table 26
Number of Hospitalized Treatment Received from Public Providers per 1000 Episodes

State/Country	Rural	Urban	Percentage of beds in government hospitals
Punjab	394	276	74
India	453	431	65

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

The cost of treatment for hospitalized or indoor patients in the private sector is nearly three times higher in rural Punjab and 5.4 times in urban Punjab as against 2.3 times and 3.1 times in rural and urban areas respectively in India (Table 27). The data further reveal that the General Ward in a private hospital would cost slightly higher than in a government hospital.

Table 27
Average Total Expenditure (in Rupees) per Hospitalized Episode Classified by Type of Hospital

Type of hospital/ward/duration/expenditure	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Type of treatment				
Government	409.75	320.34	277.86	385.02
Private	1212.17	733.38	1497.34	1206.01
All	896.80	597.06	977.79	933.33
Average total expenditure (in rupees) per hospitalized case by type of hospital				
Government hospitals				
Free Ward	1088.76	630.40	880.38	582.12
Paying General Ward	1303.19	1040.21	1682.51	1412.11
Paying Special Ward	2471.15	1482.62	1326.64	1268.08
Private Hospitals				
Free Ward	1750.16	665.65	1058.46	975.21
Paying General Ward	1407.42	1031.15	1948.85	1393.26
Paying Special Ward	3575.16	1637.85	3001.23	2862.86
Average no. of days in the hospital	15.4	15.5	13.7	15.2
Average total expenditure	1402.01	853.23	1599.84	1182.95

Source: NSS, 42nd Round', *Morbidity and Utilization of Medical Services*, July 1986-June 1987.

Household survey of health care utilization and expenditure (1995) also collected information on the breakdown of expenditure. If we look at the average cost of treatment per illness-episode for hospitalized illness by type of treatment (Table 28), we find that it is generally lower in Punjab than in India in both rural and urban areas. The difference is lower, when one compares the average cost of treatment in the private sector in Punjab with that of India. For example, the difference in cost of treatment between public and private sector is 1.8 times and 3.6 times in rural and urban areas of Punjab respectively against 3.5 times and 5.1 times in rural and urban areas at the all-India level.

Table 28
Average Cost of Treatment Per Illness Episode for Hospitalized Illness
by Type of Treatment

Type of treatment	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Public	434.21	535.20	372.81	452.55
Private	762.50	1877.21	1357.31	2318.84
Total	449.62	1044.49	696.03	1196.87

Source: NCAER, *Household Survey of Health care Utilization and Expenditure*, March 1995.

Table 29 describes the health-seeking behaviour across different social groups. It classifies the type of services, viz., free, paying general and paying special, by social groups and adult education. The share of the three services (free, paying general and paying special) start decreasing in urban and rural areas of Punjab, but the share of general cases keeps on rising with higher paying capacity.

Table 29
Percentage Distribution of Hospitalized Cases Defined by Social Groups and Adult Education Classes by Type of Hospital and Type of Ward for Rural and Urban Sectors in Punjab

Social group/ education	Rural				Urban			
	Type of ward				Type of ward			
	Free	Paying general	Paying special	All	Free	Paying general	Paying special	All
Social Group								
ST	-	-	-	-	-	11.65	-	2.15
SC	37.53	30.63	3.45	35.42	32.51	24.58	3.98	30.37
Neo-Buddhist	1.03	-	-	0.86	-	-	-	-
Others	61.44	65.05	96.55	63.14	67.49	63.77	96.02	67.48
Adult Education								
Illiterate	24.15	29.43	7.29	24.27	14.28	16.74	-	14.39
>1<5	3.99	2.68	34.54	33.85	16.74	9.11	12.59	61.56
5<10	36.67	34.54	14.90	35.63	38.70	12.59	9.03	33.17
10+	35.19	33.85	77.81	36.43	37.81	61.56	90.97	43.47
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 'NSS 42nd Round', *Morbidity and Utilization of Medical Services*, July 1986-June 1987.

The survey conducted during the 52nd Round of NSS reveals that the cost of treatment in government hospitals is much higher in Punjab than in the rest of India and vice versa for hospitals other than government. In absolute terms, the cost of hospitalized

treatment in the private sector is higher than in the rest of India. However, in relative terms the difference between the cost of treatment in private hospitals is 2.1 times and 2.4 times higher in rural and urban areas of India compared to public hospitals, the difference at 1.7 times and 1.1 times is much less in rural and urban areas of Punjab respectively (Table 30). Given the relative efficiency and better care, people are no doubt shifting towards the private sector.

Table 30
Average Medical and Other Related Expenditure (for Hospitalized Illness Episodes) per Treated illness during Last 365 Days Classified by Source of Treatment (in Rupees)

Source of treatment	Rural areas		Urban areas	
	Punjab	India	Punjab	India
Government	3645	2080	5436	2195
Other	6171	4300	6130	5344
All	4988	3200	5712	3921

Source: 'NSS, 52nd Round (July 1995-June 1996)', *Morbidity and Treatment of Ailments*, NSSO, Department of Statistics, Government of India, November 1998.

HEALTH OF VULNERABLE POPULATION

The mother and the child constitute the vulnerable sections of our society due to their heavy dependence on others for getting health care. Mothers in the state are burdened with the responsibility of adopting family planning methods. Of the total sterilizations performed in 1999-2000, the share of female sterilizations was 99 per cent. Lack of availability of the right kind of health care and of awareness about upbringing of children can lead to high morbidities and mortalities among them.

Realizing the importance of the mother and the child towards the overall future development of the state, concrete steps have been taken in a planned manner through different Five Year plans. The Family Planning Board was established in the state as early as 1958. However, a focused approach was taken up during the Fifth Plan (1974-79), when mother and child health, nutrition and family planning were introduced in an integrated manner. The beginning of the nineties brought about a change towards improving the quality of individuals, particularly women and children. In 1992-93, the state government adopted the child-survival and safe-motherhood programme. In 1994, during the ICPD conference at Cairo, major emphasis was laid on social development beyond family planning. The major goal was to provide health care to the mother and the child through the Reproductive and Child Health Programme. The Cairo conference stated the reproductive health care as 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in all matters related to the reproductive system...'. India being a signatory to this conference also implemented the Cairo Declaration with complete earnestness.

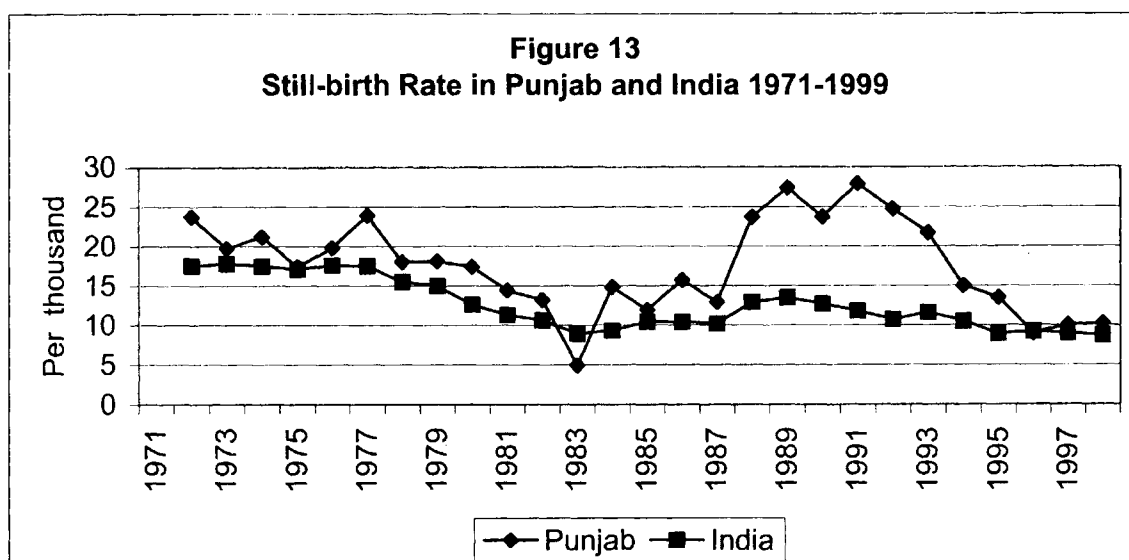
In 1996, the Child Survival and Safe Motherhood Programme was incorporated into the Reproductive and Child Health Programme. During this period, the focus was shifted to providing quality health services. Numerical targets for sterilization and immunization were given up and provision of quality services was stressed under the Target Free Approach (renamed as Community Needs Assessment Approach). In the absence of its own policy for taking care of the mother and the child, the state government is following the guidelines set by the Ministry of Health and Family Welfare, Government of India in the form of policies or programmes.

Maternal Care and Management

The declining sex ratio, especially in the 0-6 years age group (793 per 1000 live births), high maternal mortality rate and a large section of anaemic women (41%) indicate the poor condition of women in the state. Sex-selective abortions in the state, which have picked up during the last decade, will further deteriorate the health of women. Even though estimates of the repeated abortions that a woman undergoes are not available, its high prevalence in the state cannot be denied. Besides the psychological trauma the woman undergoes, her physical health also deteriorates. This could result in higher maternal mortality rates. The National Population Policy 2000 has set a target of reducing the MMR to below 100 by the year 2010, which the state aspires to achieve. This reinforces the urgency of ensuring that all pregnant women receive adequate antenatal care and deliveries take place under hygienic conditions with the assistance of trained medical practitioners. Further, meticulous post-partum care needs to be imparted to the mother and the child to help them to recoup and adjust to the new environment.

Antenatal Care

Antenatal care monitors the progress of pregnancy, identifies, and treats maternal complications. It also helps in identifying high-risk pregnancies reflected in imbalances in height, weight, immunization patterns, anaemia levels and age at the time of giving birth. In Punjab, 2.5 per cent females are susceptible to high-risk pregnancies as they get married before the age of 18 years. One out of every four women in Firozpur and Muktsar districts marries before 18 years of age.²¹ Among other high risk factors such diseases as tuberculosis, measles, and hypertension at the time of pregnancy, can result in various deformities, premature births and still-births.



Source: Registrar General, India, *Compendium of India's Fertility and Mortality Indicators (1971-1997) based on Sample Registration System (SRS), 1999.*

²¹ *Sample Registration System Statistical Report, 1998.* Registrar General, India, New Delhi, 1998 and *District Wise Social Economic Demographic Indicators*, National Commission on Population, New Delhi, 11th July 2001, p. 26.

The inadequacy of antenatal care services provided to women, besides other factors, is reflected in the generally higher still-birth rate in Punjab, than the national average. During 1986-1991, the still-birth rate almost doubled, from 12.9 to 24.7 per 1,000. Inadequate antenatal care is evident also from the NSS 42nd round, wherein just one-fourth of the women in rural and urban Punjab were receiving antenatal care.²² Antenatal care also plays a significant role in reducing premature births. Three per cent of the women in the state with no antenatal care reported premature births as against 2.7 per cent with antenatal care of one to three visits (NFHS, 1998-99). In South Indian states antenatal care is higher than in the North Indian states.

Utilization of antenatal care services in Punjab has declined from 88 per cent to 74 per cent during 1992-93 and 1998-99 (Table 31). The decline in the number of women receiving at least one antenatal check-up needs immediate intervention, to reduce still-births, underweight births and other complications leading to increased maternal mortality rates. The use of tetanus toxoid increased from 83 per cent to 90 per cent and of iron and folic acid tablets from 74 per cent to 80 per cent during 1992-93 to 1998-99.

Table 31
Antenatal Care Indicators, Punjab and India (per cent)

Antenatal care indicators	1992-93		1998-99	
	Punjab	India	Punjab	India
Percentage of women receiving ANC	87.9	62.3	74.0	65.4
Percentage receiving two doses of tetanus toxoid vaccine	82.71	53.8	89.9	66.8
Percentage receiving iron/folic tablets	73.6	50.5	79.6	57.6

Source: *National Family Health Survey-1 and 2, Punjab, India, 1992-93 and 1998-99*

One out of every four women did not avail antenatal care services in Punjab as against one out of three at the national level in 1998-99 (Table 32). Differences in rural-urban bias in the utilization of antenatal care services are evident at both state and national levels. Non-utilization of antenatal care services in rural areas is three times higher than in urban areas at the state level as well as at the national level. Absenteeism of medical/paramedical staff from duty at the primary health centre and below is a matter of concern and a major cause for lack of adequate antenatal care services being provided to pregnant women, as observed during field studies carried out by the Population Research Centre, CRRID, in different districts of Punjab. Further, with the ANM's manifold duty chart, with particular emphasis on promoting family planning acceptance to bring down the birth rate, antenatal care services have become secondary. There is need to redefine her job responsibilities and to increase the involvement of the multipurpose health worker (male) in the sub-centre's duties.

²² NSS, 42nd Round (1986-87), *Sarvekshana*, issue No. 432, Volume XIII, NO. 4, April-June 1990, p. S-99.

Table 32
Antenatal Care Check-ups and Stage of Pregnancy, Punjab and India (per cent)

Number and timing of check-ups	Punjab			India		
	Urban	Rural	Total	Urban	Rural	Total
0	9.7	30.8	26.0	13.6	39.8	34.0
1	0.8	2.8	2.3	6.0	8.8	8.2
2	6.7	17.0	14.7	10.5	14.1	13.3
3	13.9	15.9	15.4	14.5	14.2	14.3
4+	68.9	33.5	41.6	54.7	22.4	29.5
Not know/missing				0.7	0.8	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Median number of check-ups (for those who received at least one antenatal check-up)	4.8	2.9	3.5	4.2	2.5	2.8
Stage of pregnancy at the time of the first antenatal check-up						
No antenatal check-up	9.7	30.8	26.0	13.6	39.8	34.0
First trimester	67.7	35.1	42.6	55.1	26.6	33.0
Second trimester	20.1	31.4	28.8	24.2	25.5	25.2
Third trimester	2.5	2.6	2.6	6.9	7.6	7.4
Not know/missing				0.2	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Median months pregnant at first antenatal check-up (for those who received at least one antenatal check-up)	2.7	3.5	3.2	3.0	3.9	3.5
Number of births	207	693	900	7191	25202	32393

Source: National Family Health Survey-2, Punjab, India 1998-99

Note: Table includes only the two most recent births during the three years preceding the survey

The preferred place for availing antenatal care services in the state is a doctor or other professional outside the home. At the national level, 15.4 per cent of rural women availed antenatal care services at home as against 1.9 per cent in the state, in 1992-93 (Table 33). However, by 1998-99 the percentage of women availing antenatal services at home, both in rural and urban areas, had drastically declined. Outside home, a higher proportion of Scheduled Caste women avail services of other health professionals, while other caste women avail those of a doctor. Among women in rural Punjab, a trend of not availing antenatal care is emerging, besides a decline in the share of women seeking care from trained personnel. This is an area of concern for the improvement of the health status of females.

Table 33
Sources of Antenatal Care during Pregnancy, Punjab and India (per cent)

Sources	Punjab				India			
	1992-93		1998-99		1992-93		1998-99	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Antenatal check-up only at home from health worker	1.9	1.5	0.8	0.0	15.4	3.9	6.6	2.0
Antenatal check-up outside home from								
Doctor	29.4	50.3	34.8	63.1	31.1	69.6	41.2	74.8
Other health professionals	55.0	40.4	33.6	27.2	10.0	7.2	11.5	8.8
Trained birth attendant	0.2	0.6	-	-	0.3	0.4	0.3	0.2
No antenatal care Checkup	13.6	7.2	30.8	9.7	42.4	17.8	39.8	13.6

Source: National Family Health Survey-1 and 2, Punjab, India 1992-93 and 1998-99

Availability of the various testing instruments, such as weight, height, blood pressure and urine at the rural health centres can further promote utilization of antenatal services in the state. It is imperative to upgrade the skill of the para-medical staff through training programmes, during which specific counselling techniques can be discussed for further dissemination among the community.

Natal Care

Natal care determines the quality of care in providing women a safe, clean, hygienic environment and services of trained personnel who can efficiently cut the umbilical cord, for the safe delivery of the child. This period is extremely vital and protection against sepsis in the mother and neonatal tetanus in the infant is crucial and needs to be taken care of, as it has a direct bearing on maternal and infant health. In the state, 46.7 per cent infant deaths are due to birth injury.²³ This reinforces the view that it is important to have skilled attendance and preferably institutional deliveries, which reduce many risks associated with the process of delivery and thereafter.

Three out of every five women in the state give birth to a child at home. Traditionally, the first delivery of the woman is conducted at her parent's house. This seems to be followed more strictly in rural than in urban areas. The share of home deliveries in rural and urban areas of the state have declined by 10 and 19 per cent respectively, during 1992-93 to 1998-99. The shift towards delivery in medical institutions is a healthy trend (Table 34), but there is a long way to go to get the desired results. Besides rural-urban differentials in deliveries, caste-wise differences are also evident. A higher proportion of Scheduled Caste women deliver their babies at home (78%) followed by Other Backward Class women (67.2%) and other caste women (47.5%) (NFHS, 1998-99).

Table 34
Place of Delivery by Residence, Punjab and India (per cent)

Place of delivery	Rural				Urban			
	Punjab		India		Punjab		India	
	NFHS-1	NFHS-2	NFHS-1	NFHS-2	NFHS-1	NFHS-2	NFHS-1	NFHS-2
Public institution	10.2	7.1	10.0	12.5	8.1	9.3	30.2	29.1
NGO/Trust	-	0.3	-	0.5	-	0.0	-	1.5
Private institution	11.1	24.5	6.0	11.6	28.1	46.8	27.4	34.5
Own home	64.2	59.4	69.5	60.5	56.0	42.3	34.6	27.6
Parents' home	14.0	8.7	13.4	13.8	7.2	1.7	6.9	6.3
Other	0.4	-	0.5	1.0	0.6	-	0.5	1.0
Do not know	-	-	0.5	-	-	-	0.4	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: National Family Health Survey-1 and 2, Punjab, India 1992-93 and 1998-99

Traditionally, childbirth has been viewed as a regular physiological process not requiring any medical intervention. Thus, the dais or traditional birth attendants were not expected to have any training besides experience. Though they have never been a formal part of the public health delivery system, they have now been trained to perform deliveries under hygienic conditions. To ensure hygiene and avoid any complications of infections, the health department in the state has equipped dais with disposable delivery kits. The proportion of institutional deliveries is still very low and faith in dais is still very strong in rural areas (42%). In contrast, doctors are preferred in urban areas (48.4%); ANM/LHV is the next preferred attendant assisting during delivery in urban and rural areas (NFHS 1998-99).

²³ Registrar General, India, 1995, *Family Welfare Programme in India, Year Book, 1997-98*, Department of Health and Family Welfare, Government of India, New Delhi

The SRS 1995 figures show a low proportion of institutional births and a high proportion of births being attended by trained personnel. The recent NFHS surveys revealed that one-fourth of the total deliveries (25.0%) were conducted in medical institutions in 1992-93, which by 1998-99 had increased to a little less than two-fifths (37.5 %) (Table 35). Similar results were reported by the National Sample Survey's 42nd round. According to it, four-fifths of the deliveries were being conducted at home in both rural and urban Punjab. The proportion of home deliveries declined to 77.5 per cent in rural and to 60.6 per cent in urban areas as reported by the NSS 52nd round.

Table 35
Natal Care Indicators in Punjab and India (per cent)

Natal care indicators	1992-93		1998-99	
	Punjab	India	Punjab	India
Percentage of births delivered in medical institutions	24.8	25.5	37.5	33.6
Percentage of deliveries assisted by health professionals	48.3	34.2	62.6	42.3

Source: *National Family Health Survey- 1 and 2, Punjab, India 1992-93 and 1998-99*

District-level variations in the type of assistance at the time of delivery are evident; Kapurthala, Ludhiana and Jalandhar districts had a higher proportion of women receiving skilled attention (Table 36) at the time of delivery (87.6%, 85.9% and 84.4% respectively) as compared to Nawanshahr, Muktsar and Mansa districts (68.5%, 57.7% and 57.7% respectively). This can be attributed to differences in the availability of improved health facilities and the paying capacity of the population in these districts.

Table 36
Women Receiving Skilled Attention during Pregnancy (per cent)

Name of the district	Per cent safe Delivery	Name of the district	Percent safe delivery
Kapurthala	87.60	Sangrur	72.3
Ludhiana	85.90	Ferozpur	72.0
Jalandhar	84.40	Moga	70.0
Rupnagar	83.8	Gurdaspur	69.50
Patiala	83.60	Hoshiarpur	69.5
Faridkot	83.30	Nawanshahr	68.5
Fatehgarh	78.7	Muktsar	67.7
Bathinda	74.40	Mansa	57.6
Amritsar	73.10		

Source: District Household Survey: *Reproductive and Child Health Survey, 1998-99, IIPS, Mumbai.*
National Commission on Population, *District Wise Data, Government of India, 2001*

The target of achieving 80 per cent institutional deliveries and 100 per cent deliveries by trained personnel set by the NPP-2000 is still a distant dream for Punjab.

With the increasing impact of urbanization and the level of standard of living, privatization of maternity care, both in rural and urban areas, is evident in the state. A narrowing of the public sector and widening of the private sector for deliveries is emerging even among Scheduled Caste women. In 1992-93, one out of every ten Scheduled Caste women gave birth in a private institution as against one in every six in 1998-99.

During 1992-93 to 1998-99, the number of caesarian section deliveries doubled from 4.1 per cent to 8.2 per cent (NFHS I and II). According to the NSS 52nd round, deliveries through operations were more in urban (8.3 per cent) than in rural (5.7 per cent) areas of the state. Inadequate antenatal care and non-identification of high-risk pregnancies, coupled with vested economic interests of private practitioners, are some of the reasons for the promotion of caesarian section births in the state.

The Ninth Plan was particularly committed towards providing essential primary health care and emergency life-saving services. The 'maternity benefit scheme for women below poverty line up to two child norm', under the National Social Assistance Programme, was also initiated during this period in an attempt to take care of pregnant women. Thus, care during domiciliary delivery can be further enhanced to achieve our goal of reducing MMR to 20 per 1,000 live births by the year 2007. Considering the target of the Tenth Five Year Plan (2002-2007) to reduce the MMR to 20 per 1,000 by 2007 and to 10 per 1,000 by 2012, it is important to prioritize medical attention at birth, inadequacy of which contributes to high MMR.

Post-natal Care

Post-natal care for the mother and the child has far-reaching consequences on the former's health. Post-natal care must ensure a total state of physiological and psychological well-being of the mother. This is the period when she is recouping her health, while the child is adjusting from a protected to an exposed environment and hence, chances of occurrence of reproductive health problems among women are high.

NSSO 42nd round reveals that of the one-fourth women registering for prenatal check-up, both in rural and urban Punjab, less than one-fifth registered for post-natal care, while NSS 52nd round reported that there were 24.3 per cent women in rural and 33.5 per cent in urban Punjab registering for post-natal care (Table 37), with the public dispensary as the preferred place for rural mothers and public hospital for urban mothers. This clearly reveals that if the facilities are further improved and provided round the clock, attendance to these institutions will increase and in turn improve maternal and child health.

Table 37
Percentage of Mothers Registered for Post-natal Care by Type of Medical Institutions in Punjab and India

Percentage of mothers registered/type of institutions	Punjab (42 nd round)		Punjab (52 nd round)		India (42 nd round)		India (52 nd round)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percentage of mothers registered	11.58	13.11	24.3	33.5	12.60	23.76	24.2	39.9
Public hospital	29.84	25.13	17.6	44.5	20.51	39.37	32.5	42.1
Primary health Center	-	1.98	18.8	2.5	10.44	3.30	33.5	6.5
Public dispensary	-	-	41.2	17.5	1.16	0.53	4.5	2.1
Primary/private hospital	8.32	18.92	10.6	23.5	16.44	22.95	12.5	22.9
Nursing home	-	9.87	6.2	5.8	0.92	7.68	4.5	14.6
Charitable institution	-	-	-	2.7	0.34	0.73	0.5	1.4
ESI doctor/AMA	-	-	-	-	-	-	0.8	0.5
Private doctor	5.05	4.19	4.3	2.8	9.97	9.88	8.6	7.8
Lady Health Visitor	38.70	20.26	-	-	21.85	4.40	-	-
Others	12.58	12.80	0.6	-	1.71	1.92	0.7	0.9
Total	100	100	100	100	100	100	100	100

Sources: 'NSS 42nd Round (July 1986-June 1987)', Survey on Maternity and Child Health Care, *Sarvekshana*, Issue no. 47, Vol. XIV (April-June, 1991)
NSS 52nd round, July 1995-June 1996, *Maternal and Child Health Care in India*, NSSO, Department of Statistics, Government of India, December 1998.

Literacy level of women plays a vital role in their availing and comprehending the value of post-partum services. Women belonging to other castes have availed such services more often (24.3%) than Scheduled Caste women (17.3%)²⁴

Coordinated efforts by health providers and policy-makers are essential to provide maximum medical and paramedical staff to ensure antenatal, natal and post-natal care to the community at large, to improve the health status of the mother and the child.

Underweight Children: The impact of lower antenatal care in the state is reflected in the number of underweight children. Punjab ranks 14th and Bihar 1st with 62.2 per cent underweight children.²⁵ This reflects on the nature of health and nutritional care being provided to the mother during pregnancy. In 1992-93, little less than one-third of the children, who were weighed, were born underweight. By 1998-99, this figure came down to little less than one-fourth (Table 38). In both rounds of NFHS surveys, children in rural areas were more prone to be born underweight than their counterparts in urban areas. The all-India pattern was more or less the same as in Punjab. This can be attributed to the availability of weighing machines at the time of birth. This can be further achieved by promoting institutional deliveries, in which newborn babies would be weighed, besides creating awareness of getting the children weighed at the time of birth.

Table 38
Under-weight Children at the Time of Birth, Punjab and India (per cent)

State	Less than 2.5 kg.	2.5 Kg. Or more
1992-93		
Punjab	28.6	71.4
Rural	31.0	69.0
Urban	25.4	74.6
1998-99		
Punjab	23.8	76.2
Rural	25.3	74.7
Urban	21.6	78.4
1992-93		
India	26.0	74.0
Rural	24.7	75.3
Urban	26.3	73.7
1998-99		
India	22.7	77.3
Rural	23.9	76.1
Urban	21.1	78.9

Source: Calculated from NFHS 1 and 2

Reproductive Health Problems: Reproductive health problems are those inhibiting the ability of men and women to achieve their reproductive goals. Among all the states of India, in Punjab, 28.3 per cent of women have reproductive health problems as against 19 per cent in Karnataka and 28 per cent in Tamil Nadu. Women rely more on private health care services (46.5%) than the public health sector (17.6%) (NFHS 1998-99) for the treatment of such problems. Considering the confidential nature of the problem,

²⁴ National Family Health Survey-2, Punjab, India 1998-99

²⁵ Gopal, Krishan, (1997) 'Spatial Contrasts in Socio-demographic Profiles of India', *Population Geography*, Volume, 19, No.,1 & 2, June-December 1997.

possibilities of under-reporting seem to exist. Levels of literacy and awareness and non-availability of medical and para-medical staff according to women's convenience could be attributing factors to under- or non-reporting of such problems. Punjab has an existing staff of 105 gynecologists in rural areas, but their availability seems to be sparse, hence, the need to reshuffle them, keeping the real needs of the people in mind. This will prove beneficial not only to the women but also for the achievement of the health goals of the state.

Infertility: Infertility among women is another vital problem, which has a very profound social and psychological impact on the psyche of the women in particular. Treatment facilities for infertility are available only at tertiary-care public units, though the private sector in Punjab is playing a very strategic role in providing treatment for this problem. A need to undertake systematic studies and research on infertility is imperative.

Child Health Status

A child is not just a component of a large population, rather it is a component of development. Investments in the improvement of the health status of children would determine the future workforce and quality of life of Punjab. Child health and survival are the most important aspects of the Family Welfare Programme in the state. Every effort is being made to prevent childhood morbidity and mortality by providing different kinds of immunization.

The Infant Mortality Rate (IMR) is an indicator of the status of infant-health and the quality of care being provided in the state. The IMR shows the level of social development and the state of physical quality of life in a particular area. It is also a reflection of the nutrition level of the mother and the child, health-care facilities available in the area, and the level of economic development. Besides other factors, advancement in health services, comprising of preventive care -- immunization services -- and promotive care, in terms of distribution of iron and folic acid tablets and cotrimoxazole, have also played an important role in bringing down the IMR in the state. A constant decline from 1971 to 2000 is evident in Punjab and at the national level, though the decline in the state is slower than the national average. The state's IMR at 52 in 2000 is significantly lower than 68 at the national level. Economic prosperity of the state is not reflected in its IMR level. In comparison with Kerala, the IMR in Punjab is four times higher. This is an expression of the better-health care system in Kerala, besides the high status allocated to women and a higher literacy rate.

Mortality among infants and children, classified as infant mortality, neonatal, post-natal and peri-natal mortality levels have also declined during 1971-1997. This is an indicator of increased child survival rates (Figure 14²⁶). Further, according to the National Population Policy 2000, neonatal care has been identified as a priority area and its implementation should be intensified with the help of pediatricians, gynecologists, anesthetists and other public health specialists.

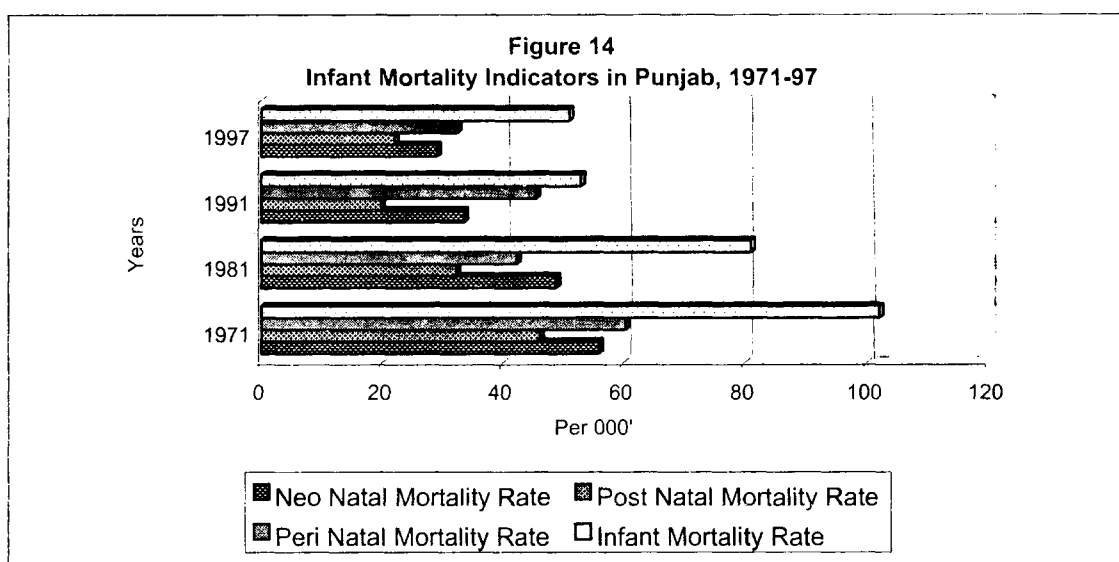
Prevention of childhood mortality was one aim of starting a Universal Immunization Programme in 1985-86 in the state. Immunization trends in Punjab are encouraging. Pulse Polio was given the shape of a drive in 1995 with the 'Pulse Polio Campaign' all over India. Trends, subsequent to that, in Punjab have been continuously upward. In the

²⁶ Registrar General, India, *Compendium of India's Fertility and Mortality Indicators (1971-1997) based on Sample Registration System (SRS), 1999.*

Eighth Plan, the Government of India had provided cold-chain equipment and the state government was made responsible for maintaining its requisite temperature, so that the vaccines did not lose their potency. Special grants were allocated subsequently for provision of independent feeder/generator for uninterrupted power supply/solar water heating panels in the hospitals. Subsequent assistance has been sought from the World Bank to further strengthen the immunization project.²⁷

Improvement in the vaccination coverage has been confirmed by two National Family Health surveys conducted in Punjab. More than four-fifths of the children have been vaccinated against tuberculosis, diphtheria, pertussis, tetanus and polio by 12 months of age. A higher proportion of urban than rural children have been vaccinated before one year of age. However, a stringent drive against measles is required both in urban and rural health centres to achieve an upward trend. A clear-cut gender bias towards the male child has emerged in the immunization trends in Punjab. Elamon²⁸ (1998) worked out the gender differentials in child immunization on the data of NFHS (1992-93) and confirmed these results. Gender bias towards the male child is evident from the possession and presentation of immunization cards (NFHS I & II) (Table 39). At the district level, Hoshiarpur and Rupnagar have achieved 90 per cent immunization of children, while Firozpur and Moga districts are lagging far behind.²⁹

Caste-wise differential in the immunization services are evident. Four out of every five children belonging to the other category were immunized as against little more than one out of two among Scheduled Castes. A smaller proportion of Scheduled Caste children were immunized against measles (61.1%) and BCG (77.1%) than those belonging to the other category (NFHS, 1998-99).



Source: Source: Registrar General, India, *Compendium of India's Fertility and Mortality Indicators (1971-1997) based on Sample Registration System (SRS), 1999.*

²⁷ Annual Plan, 2001-02, Ministry of Health and Family Welfare, Government of India, New Delhi

²⁸ Joy, Elamon, (1998), 'Gender Differentials in Child Immunization: A Study Based on NFHS Data', *Journal of Family Welfare*, Voi. 44, No. 3, September 1998)

²⁹ District Wise Social Economic Demographic Indicators, National Commission on Population, New Delhi, 11th July 2001, p. 50

Table 39
Vaccination Coverage in Punjab and India (per cent)

Vaccines	Coverage in Punjab		Coverage in India	
	1992-93	1998-99	1992-93	1998-99
B.C.G	77.4	88.7	62.2	71.6
Polio 0	1.7	11.2	4.6	13.1
DPT 1	81.9	88.4	66.3	71.4
DPT 2	78.5	87.3	59.2	65.0
DPT 3	73.6	82.0	51.7	55.1
Polio 1	82.2	90.5	67.0	83.6
Polio 2	78.2	88.5	61.2	78.2
Polio 3	73.4	83.6	53.4	62.8
Measles	64.8	76.5	42.2	50.7
All	61.9	72.1	35.4	42.0
None	17.5	8.7	30.0	14.4
Percentage showing vaccination card	37.8	43.0	30.6	33.7

Source: *National Family Health Survey-1 and 2, Punjab, India, 1992-93 and 1998-99*

Though immunization trends of most of the vaccine-preventable diseases seem optimistic, concerted efforts are necessary to maintain the existing trends, improve on gray areas and aim to achieve 100 per cent immunization for all the vaccines as is the state target.

Acute respiratory infection and diarrhoea: To combat such fatal diseases as Acute Respiratory Infection and diarrhoea among children, the Government of India has initiated such intervention strategies as the ARI to combat pneumonia and Oral Rehydration Therapy to combat diarrhoea. The state government has followed, too. The Oral Rehydration Therapy Programme was started in 1986-87 and is continuing at present. Strategies for ARI were developed during 1989, under which health workers were trained in ARI management and cotrimoxazole is being supplied to health worker through the CSSM drug kit.

NFHS II reports that the incidence of ARI and diarrhoea was more in the urban areas of Punjab, while fever and diarrhoea with blood was more in the rural areas. Nine out of every ten children in rural areas and all in urban areas sought treatment for ARI as against three out of every five in rural areas and three out of four in urban areas at the national level (Table 40).

Table 40
Prevalence of Acute Respiratory Infection (ARI), Fever and Diarrhoea among Children under Age Three Years in Punjab and India (per cent)

Percentage of children suffering in the past two weeks from:	Punjab		India	
	Rural	Urban	Rural	Urban
Cough accompanied by fast breathing (ARI)	14.0	15.9	20.3	16.2
Fever	25.8	21.6	29.7	28.8
Any diarrhoea	9.4	11.0	19.0	19.6
Diarrhoea with blood	0.7	0.4	2.9	1.6
Percentage with ARI taken to a health facility or provider	91.6	100.0	61.4	75.1

Source: *National Family Health Survey 2, Punjab, India, 1998-99.*

Children from families with a low standard of living suffer more from diarrhoea and those with a medium standard of living from fever. As far as the knowledge of Oral Rehydration Therapy is concerned 78.1 per cent mothers in rural and 93.3 per cent in urban areas are aware of it. The private medical sector (60.1%) is preferred rather than the public medical sector (36.9%) for procurement of ORS.

Child and adolescent health are areas of vital concern, and has very far-reaching repercussions. The School Health Check-up Programme, as a national programme, can prove to be a major success if its implementation and evaluation is a regular feature at the state level. The School Health Check-up Programme (1996) evaluation conducted in Patiala and Rupnagar districts by the Population Research Centre, CRRID, reveals differential morbidity patterns among rural and urban areas. Children in rural areas suffer from worm-infestation and pyoderma, while in the urban areas anaemia and teeth cavities are more prevalent. To provide comprehensive oral health care, the Intensive Dental Health Programme for school children, teachers and the public was launched in the state in 1989-90. Inter-linkages, developed between the health and education departments, can strengthen the programme and our concern for future development.

Adolescent health care: Adolescence is a period of turmoil and thus requires much more care. The National Population Policy 2000 has highlighted the significance of this age group and their priorities. The NFHS- 1998-99 reveals that adolescent girls (15-19 years) are most anaemic. They are likely to carry this problem into their reproductive age as well. As a result of which they could give birth to anaemic and underweight children. In fact, this becomes a life-cycle disease. Further, very positive figures of reaching targets of immunization against tetanus toxoid of children at 16 years are not available. This indicates lack of initiative among medical staff as well as the community in this area, with respect to this vulnerable section of society, particularly girls who are getting ready for motherhood. A specific programme for provision of access to information and counselling services, pertaining to their health, nutritional and reproductive needs and problems, is an urgent need for adolescents in Punjab. Age at menarche' is a less researched area and a major determinant of the nutritional status of adolescents which calls for indepth research. Adolescent services cells could be made accessible at the primary health centres, to ensure adequate dissemination of information, optimal utilization of services available and guidance.

In all there has been considerable progress in the status of health of children in Punjab, even though scope for further improvements exist. Gender biases are evident in the kind of treatment being provided to the female child. This is an urgent area of intervention. A healthy child is the end-goal of development and thus medical and social programmes need to be considered together.

Role of medical/paramedical staff for MCH services

Centrally sponsored schemes, such as Village Health Guides, are being implemented in the state. The Ministry of Health and Family Welfare, Government of India, has discarded the sponsorship of the VHG scheme, it has been left to the state government to carry it forward if such a need is felt. The Mahila Swasthya Sangha Scheme, with women and childcare as one of its objectives, is currently being implemented in the state.

In Punjab, there are eleven multipurpose health worker (male and female) training schools, but their syllabus and education need immediate and closer attention. There is an imbalance between their education and the real need of the community. Further,

trained manpower is being underutilized by not being absorbed in the government/private medical mainstream.

A wide network of multipurpose health workers is in position in the state, but what is lacking is their qualitative utilization through enforcement, inspection and mobilization. Even though there has been progress in many economic and social spheres, basic services, such as sanitation, cleanliness, adequate water supply and hygiene- are inadequate in Punjab and these are basic requirements for keeping good health. There has been progress on many fronts; nevertheless, the profound changes called for will take some time to accomplish. Along the bumpy road of implementation, doubts about the appropriateness of some of the proposed actions are likely to surface. Yet, political will, dedication and accountability of medical and paramedical staff and the community at large can lead Punjab to success.

NUTRITION AND RELATED ISSUES

Nutrition affects development as much as development affects nutrition (*National Nutrition Policy 1993*). The Constitution of India, Article 47, states that the 'State shall regard the raising of the level of the nutrition and the standard of living of its people and the improvement of public health among its primary duties...' The NNP 1993, further advocates a comprehensive, integrated and inter-sectoral strategy for alleviating the multi-faceted problem of malnutrition and achieving the optimal state of nutrition for the people. The policy includes short-term as well as long-term interventions. The direct short-term interventions include:

- Expanding the nutrition intervention net (ICDS,ORT,UIP).
- Empowering mothers with nutrition and health education.
- Reaching adolescent girls.
- Ensuring better coverage of expectant women.
- Controlling micronutrient deficiencies.
- Fortifying essential foods with nutrition.
- Universal coverage of iron and folic acid tablets, vitamin A and iodine deficiency control programme.

From a food-deficit state Punjab has become a food-surplus state, thanks to the green revolution. However, the Nutrition Policy 1993 maintains that increased food production does not necessarily ensure nutrition for all. It is awareness about the 'right' kind and 'amount' of food intake, which determines the nutritional status of an individual. The major issues of concern about the nutritional status of the people of a state are chronic energy-deficiency and under-nutrition, chronic energy-excess and obesity, micronutrient deficiencies (anaemia, vitamin-A, iodine and fluoride).

Nutritional Status of Adults

Chronic energy-deficiency (CED) grades in adults reflect their nutritional status, and is determined by Body Mass Index (BMI), based on height and body-weight - wt (kg)/ht (mt) 2. Chronic Energy Deficiency is classified as CED-I (BMI range of 17.0 -18.5), CED-II (BMI 16 -17) and CED-III (BMI <16). Low normal-status adults (BMI 18.5 -20), normal-status adults have (BMI 20-25), Obese-I (BMI 25-30) and Obese-II (BMI>30). Little less than one-fourth of the adult population in Punjab suffer from chronic energy-deficiency, of whom a large proportion suffer from mild forms of CED. Obesity is emerging as a

major problem in Punjab, with nearly 15 per cent adults suffering from obesity, which leads to such 'major killers' as non-insulin dependent diabetes, coronary artery diseases, cardiovascular diseases and malignancy (Table 41). The National Family Health Survey (1998-99) reported that Punjab has the highest proportion of obese women in India.

Table 41
Distribution of Adults according to Body Mass Index (in per cent)

State	Area	CED III	CED II	CED I	CED Total	Low Normal	Normal	Normal Total	Obese I	Obese II	Obese Total
Punjab	Rural	4.1	5.2	13.7	23.0	19.0	43.2	62.2	12.2	2.6	14.8
India	Rural	8.6	7.8	18.2	34.6	20.9	40.5	61.4	4.1	0.7	4.1
	Urban	6.8	6.1	14.7	27.7	18.4	47.9	66.3	5.4	0.6	6.0
	Total	8.2	7.4	17.3	32.9	20.4	42.1	62.5	3.8	0.7	4.5

Source: *India Nutrition Profile*, Department of Women and Child Development, Ministry of Human Resource Development, Government of India. (1998)

One-third of the adults in Bathinda suffer from CED as against 28 per cent in Sangrur. Adults in Kapurthala, Jalandhar, Faridkot and Amritsar are reported to be relatively more obese than in the other districts (Table 42). Factors responsible are low awareness about the kind of food to consume and faulty eating habits. Thus, improvement in the situation is possible by checking food consumption patterns of the people of Punjab.

Table 42
Prevalence of CED, Normal and Obese at District Level, Punjab (Rural) (in per cent)

District	CED III	CED II	CED I	CED (T)	Low normal	Normal	Normal (T)	OBESE I	OBESE II	OBESE (T)
Amritsar	3.1	4.3	11.9	19.3	20.4	42	62.4	14.3	4	18.3
Bhatinda	6.9	6.6	18.8	32.3	18.4	34.4	52.8	11.8	3.1	14.9
Faridkot	5.2	6.4	14	25.6	15	37.9	52.9	16.9	4.6	21.5
Ferozpur	5	6	14.3	25.3	20.3	40.4	60.7	11.7	2.3	14
Gurdaspur	6.6	6	16.1	28.7	21.2	38.5	59.7	10.1	1.5	11.6
Hoshiarpur	0.8	3.2	8	12	15.5	61.3	76.8	10.8	0.4	11.2
Jalandhar	2.6	5.1	13.4	21.1	16.5	40.8	57.3	18.2	3.4	21.6
Kapurthala	2.2	2.6	10.7	15.5	15.4	45	60.4	20.1	4	24.1
Ludhiana	2	5.5	11.7	19.2	24.6	53.7	78.3	2.4	0.1	2.5
Patiala	5.8	6.1	14.9	26.8	17	41.1	58.1	11.5	3.6	15.1
Rupnagar	4.2	4.7	15.3	24.2	25.9	47.6	73.5	1.9	0.4	2.3
Sangrur	6.1	6.1	16	28.2	18	35.7	53.7	14.8	3.3	18.1
Punjab	4.1	5.2	13.7	23	19	43.2	62.2	12.2	2.6	14.8

Source: *India Nutrition Profile, 1998, Ministry of Human Resource Development, Department of Women and Child development, Government of India, New Delhi*

Nutritional Status of Women

Maternal nutrition lays the foundation of future child-health. In Punjab, the mean height of women (154.5 cm) is the tallest among all the states in India. As compared to the other states of India the lowest number of women in Punjab (16.9%) suffer from Chronic Energy Deficiency, just after Delhi (12.0%). However, the worrisome factor is that women, susceptible to chronic energy deficiency, fall in the 15-19 age group and they are illiterate and live in rural areas. Scheduled Caste women, with a low standard of living, are more prone to such deficiencies. Among all the states in India, Punjab has the highest proportion of obese women (30.2%) just after Delhi (33.8%) (NFHS, 1998-99). This makes them prone to high-risk pregnancies.

Nutritional Status of Children

Anthropometric data (weight and height) for children under four years are used to classify them as under-nourished. The indices used are weight for age, height for age and weight for height. The current nutritional status of children under four years in the state indicates that less than one-third (28.7%) are underweight, nearly two-fifths (39.2%) stunted in height and less than one-tenth (7.1%) are too thin or wasted (Table 43). Percentage of severe forms of underweight are 8.8, stunted 17.2 and too thin or wasted 0.8.

Table 43
Nutritional Status of Children

State	Weight for age				Height for age				Weight for height			
	% below -3SD		% below -2SD ¹		% below -3SD		% below -2SD ¹		% below -3SD		% below -2SD ¹	
	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99	1992-93	1998-99
India	20.6	18	53.4	47	28.9	23	52	45.5	3.2	2.8	17.5	15.5
Punjab	14.2	8.8	45.9	28.7	15.7	17.2	40	39.2	2.8	0.8	19.9	7.1

Source: National Family Health Survey-1 and 2.

Note : 1 Also includes the children who are below -3 Standard deviations from the International reference population median

Though the nutritional status of children has improved since the last NFHS, conducted in 1992-93, except for the height for age wherein children are more stunted than in 1992-93. Female children were found to be more under weight, stunted and thin than male children. At the national level, more females were underweight and stunted and male children too thin or wasted. The problem was more profound in rural than in urban areas in the state as well as at the national level.

Table 44
District Level Prevalence of Underweight, Stunting and Wasting among Children (1-5 years), Punjab (rural), 1998

District	Underweight			Stunting			Wasting		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Amritsar	46.7	47.5	47.1	61.5	60.8	61.2	5.1	5	5.1
Bhatinda	52.9	60.3	56.1	57.9	63	60	6.9	12.3	9.1
Faridkot	49.2	46.3	47.9	63.9	53.8	59.5	1.6	6.5	3.8
Ferozpur	52	58.5	54.8	65.6	78.2	71.3	10.7	3.8	7.6
Gurdaspur	51.9	68.6	59.5	61.8	65.1	63.3	12.8	16.3	14.1
Hoshiarpur	18.6	18.9	18.7	48.5	41.5	45.5	4.3	5.7	4.9
Jalandhar	39.3	36.3	37.9	66.4	66.7	66.5	2.4	2.9	2.6
Kapurthala	38.5	35.3	37.1	58.1	59	58.5	6	7.9	6.9
Ludhiana	62.9	62.7	62.8	33.4	48.1	40.9	49.4	38.5	43.9
Patiala	54.9	52.2	54	60.4	41.3	54	17.6	17.4	17.5
Rupnagar	87.1	78.9	83.2	74.4	50.7	63.1	32	40.8	36.3
Sangrur	46.7	43.3	45.1	58.6	59.7	59.1	2.7	13.4	7.7
Punjab	49.6	51	50.3	60	59.2	59.7	11.4	13.1	12.1

Source: India Nutrition Profile, 1998, Ministry of Human Resource Development, Department of Women and Child Development, Government of India, New Delhi

Among the districts of Punjab, rural Rupnagar reported the highest percentage of underweight children, while Ferozpur the highest percentage of stunted (short for their ages) children and Ludhiana the maximum percentage of wasted children (Table 44).

Micronutrient Deficiencies

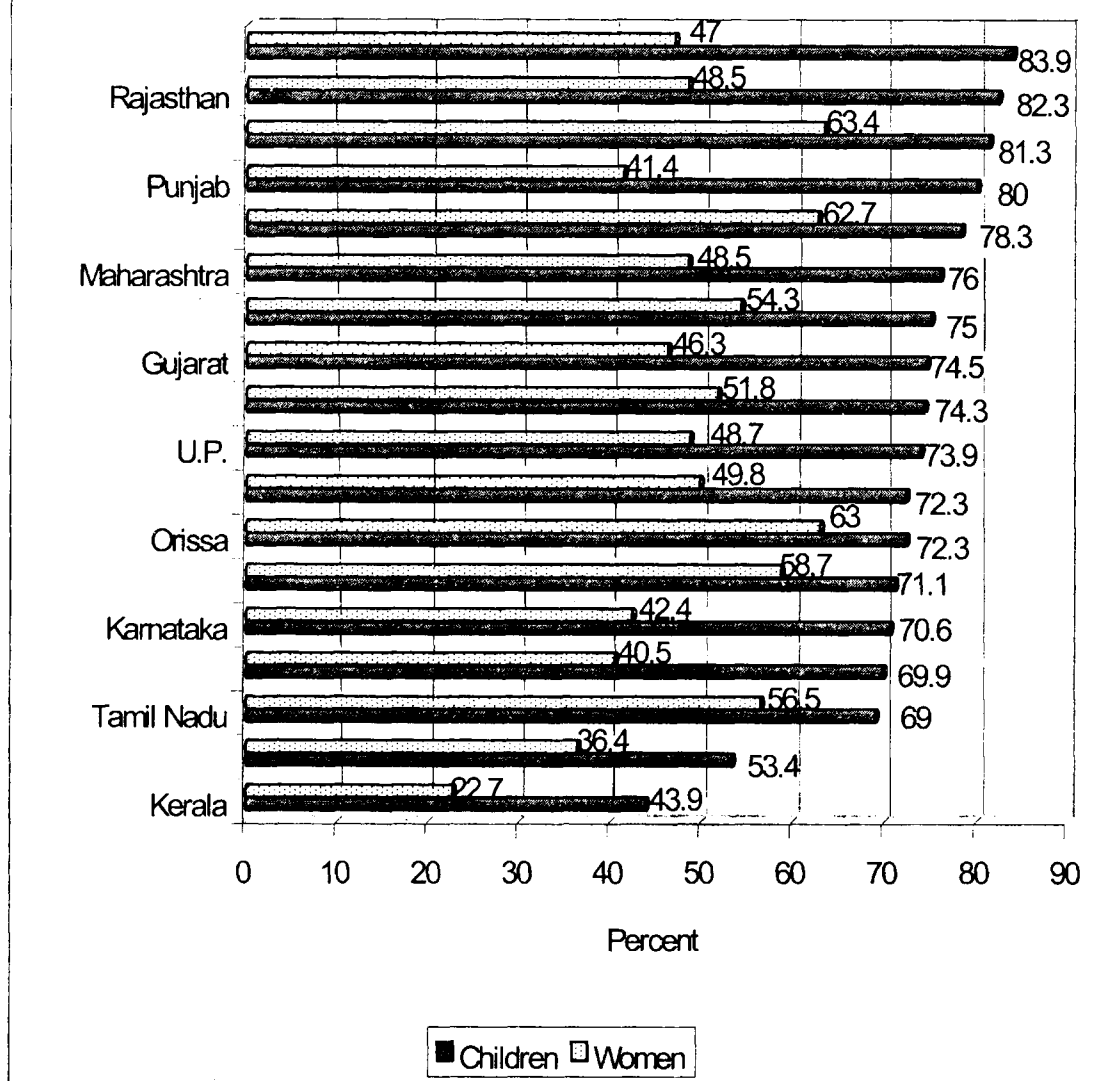
Anaemia: Anaemia or iron and folic acid deficiency is one of the micronutrient deficiencies, which needs constant vigil and special mention. Its consequences are very far-reaching, particularly among children. Anaemia in a child leads to impaired cognitive performance and behavioural and motor development and ultimately affects his academic performance. Anaemia also leads to reduced immunity and increased morbidity of children.³⁰ NFHS-II reported that in Punjab 80.0 per cent of the children in the age group 6-35 months were anaemic of which 5.9 per cent were severely anaemic, while the corresponding percentages at the all-India level were 74.3 and 5.4 respectively. Children in the age group 24-35 months reported the highest level of anaemia (79.3%) in the state. Anaemia levels were also higher among the rural (80.9 %) and Scheduled Caste (86.1%) children in Punjab.

Anaemia among pregnant women leads to maternal mortality, risk of premature delivery and low birth-weight. In Punjab 41.4 per cent women suffer from anaemia, of whom 0.7 per cent are severely anaemic. At the national level the corresponding percentages are 52 and 1.9. A high percentage of women in the 15-19 age group are anaemic (56.0%). A higher percentage of anaemic women are illiterate (55.8%) and live in rural areas (53.9%).³¹ To combat nutritional anaemia, prophylaxis distributed among pregnant women has surpassed the set target since 1980-81. However, the provision of prophylaxis against nutritional anaemia for children of 1-3 years has reached 62.3 per cent of the target set by the Directorate of Health, Government of Punjab (2000-01). There has been a continuous decline in the provision of prophylaxis against anaemia for children since 1980-81.

³⁰ Subadra Seshadri (1997) 'Nutritional Anaemia in South Asia', In Stuart Gillespie (ed.), *Malnutrition in South Asia: A Regional Profile*. Kathmandu: Regional Office for South Asia, UNICEF.

³¹ *National Family Health Survey-2, Punjab, India 1998-99*

Figure 15
Anaemia among Women and Children



Source: National Family Health Survey-2, Punjab, India, 1998-99

Fluoride deficiency: Prolonged intake of water containing excess fluoride causes the crippling disease called fluorosis. Prolonged ingestion manifests itself as dental, skeletal and non-skeletal fluorosis. Malnourished children, pregnant women and lactating mothers are especially vulnerable to fluorosis. In Punjab 8.9 per cent of the population are at risk (21 lakh) as against 6.9 per cent population (6.66 crore) at the national level.³² The INP³³ revealed that in rural Punjab there were 2.8 per cent persons suffering from

³² *Mitigating Fluorosis Through Safe Drinking Water*, Data sheets, UNICEF

³³ *India Nutrition Profile*, Ministry of Human Resource Development, Department of Women and Child Development, Government of India, New Delhi, 1998.

dental fluorosis. Interventions include a diet rich in calcium, Vitamins C, E and antioxidants.

Iodine deficiency: Iodine is a vital micronutrient. Iodine-deficiency disorders have been identified as a public health issue and accorded importance since the mid-twenties. The National Iodine Deficiency Disorders Control Programme has concentrated on ensuring the consumption of iodized salt. NFHS-II (1998-99) reports that in Punjab three-fifths of the households use iodized salt. Scheduled Castes and persons living in rural areas with a low standard of living do not use iodized salt.

Vitamin-A deficiency: Vitamin-A deficiency can lead to blindness. Hence, its prevention and control is being carried out by administering doses of the vitamin-A to children under three years of age. Provision of Vitamin-A solution to children is a shared responsibility of the health department of the state and the ICDS staff. The achievement of Punjab's health department on administering Vitamin-A drops to children in 1998-99 was 96.97 per cent.

Food Consumption Patterns

A study of the food consumption patterns of a community is imperative to ascertain its nutritional status. The NSSO carried out sample surveys in 1971-73 (27th round), 1981 (38th round) and 1991-94 (50th round) to assess the consumption of calories, proteins and fats. According to these surveys, consumption of calories and proteins declined in both rural and urban areas of Punjab during 1971-1994 (Table 45). But the consumption of fats in rural Punjab increased from 50 kcal in 1971-73 to 52 kcal in 1981 and then to 59.8 kcal in 1993-94.

Table 45
Per Capita Intake of Calorie, Protein and Fat per Diem in Punjab and India
(NSS rounds)

Area	Calorie according to			Protein according to			Fat according to		
	27th round	38th round	50th round	27 th round	38 th round	50th round	27th round	38 th round	50 th round
	1972-73	1983	1993-94	1972-73	1983	1993-94	1972-73	1983	1993-94
	(Kcal)	(Kcal)	(Kcal)	(0.0Gm)	(0.0Gm)	(0.0Gm)	(0.0Gm)	(0.0Gm)	(0.0Gm)
Punjab									
Rural	3493	2677	2418	85	79	74.7	50	52	59.8
Urban	2783	2100	2089	70	63	61.8	52	49	53.7
India									
Rural	2266	2221	2153	62	62	60.2	24	27	31.4
Urban	2107	2089	2071	56	57	57.2	36	37	42

Source: Sarvekshana, Volume 21, No. 2, 73rd Issue, October-December 1997, NSSO, Department of Statistics, Government of India, p.45

In a urban areas of Punjab, the fat intake was more or less the same during the 1972-94. A positive correlation between per capita expenditure and per capita per diem intake of calorie, protein and fats was seen in both rural and urban Punjab (NSSO 50th round, 1993-94). The per capita consumption of milk is 875 grams per day in Punjab.³⁴ In rural

³⁴

Statistical Abstract of Punjab, Government of Punjab, 2000

Punjab the consumption of milk and its products is much higher than at the national level. Consumption of roots and tubers is higher than that of other vegetables and cereals in rural Punjab, according to the RDA.³⁵ Thus, the food consumption pattern has very strong social, cultural and economic dimensions.

In spite of the rich dietary pattern and availability of iron and folic acid tablets at the grassroots level, a large proportion of women and children in Punjab suffer from anaemia. Intervention exists today only for pregnant women and children up to six years of age. Inadequate institutional deliveries result in low awareness-levels among women, which indirectly affects infant-feeding practices. Faulty eating habits, type of food consumed (usually fat-rich and high-caloric), overeating and urbanism (the diet remaining unchanged despite work-culture having undergone drastic changes), can result in obesity, which, in turn, leads to various health problems. Obesity may not be perceived as a disease but it lead to hypertension, heart disease, diabetes and cancer and other chronic diseases in women. Hence it needs intervention.³⁶

Food consumption pattern among women: As far as the food consumption pattern of women in Punjab is concerned nearly all consume pulses or beans, green leafy vegetables and other vegetables. More than 90 per cent of them consume milk or curd, though the consumption of fruits, eggs and chicken, meat or fish is a little low. More than two-fifths of the women (41.4%) of Punjab suffer from anaemia. Caste does not seem to determine the pattern of consumption of food. The high standard of living is reflected in increased consumption of pulses, leafy vegetables and other vegetables, roots and tubers, fruits, milk and its products and sugar.³⁷

Infant feeding practices: The right kind of infant feeding practices are essential for child health. To monitor nutritional deficiencies in children and to improve their nutritional status, it is necessary to explain the importance of breast-feeding to mothers. The UNICEF recommends breast-feeding immediately after birth. In Punjab six out of hundred mothers breast-feed their child within one hour of birth, while at the national level 15.8 per cent do so. Lack of awareness about the right kind of practices are evident: 87.3 per cent of the mothers in Punjab squeeze out the first milk from their breast, without any knowledge of the value of colostrum in the first milk. Less than two-fifths of the children (36.3%) in the 0-3 months are exclusively breast-fed. In Punjab, 14.2 per cent women, who had their delivery in public hospitals, started breast-feeding within six hours. Breast-feeding within six hours is prevalent among women in urban areas and those belonging to middle and high standards of living.³⁸ This again reinforces the issue of the advantages of institutional deliveries. This is one area where interventions need to be made in Punjab.

³⁵ *India Nutrition Profile*, Department of Women and Child Development, MOHRD, GOI, 1998

³⁶ Meena Kaila (1999) 'Health and Lifestyle-- The Veritable Linkage' *Health for the Millions*, Vol., 25, no. 3, May-June 1999.

³⁷ *National Family Health Survey-2, Punjab, India 1998-99*

³⁸ *Ibid*, p. 255

Government Initiatives

The government has initiated the ICDS to combat malnutrition and other health problems. This scheme provides supplementary nutrition to children below six years of age and to nursing and expectant mothers. Kishori Shakti Yojana for adolescent girls was initiated in three blocks of Punjab in 1999-2000 to help adolescent girls understand and learn the significance of personal hygiene, sanitation, nutrition, first aid, health and nutrition education, family life, child care and development, etc., and to prepare for future healthy motherhood (Tenth Five Year Plan, 2002-07 and Annual Plan 2002-03, Government of Punjab, Department of Planning). The Food and Nutrition Board has been assigned the task of formulating cost-effective recipes that could be sent to all the *Anganwadi* workers, who could disseminate these in the community at large.

The Public Distribution System (PDS) was initiated during the Seventh Plan to ensure food security and equitable distribution of essential goods at subsidized rates. Wheat and rice are being distributed to families below poverty level since 1998-99. The distribution of such essential commodities as wheat flour, rice, levy sugar through fair price shops decreased in 1999-2000 as compared to 1998-99, due to the narrowing of the price-difference gap between the PDS and the market.³⁹ The state has a network of 14,787 fair price shops as in March 2001.⁴⁰

Prophylaxis against nutritional deficiencies of iron and vitamin-A is provided through the Directorate of Health and Family Welfare and the partly through the ICDS. Iodine deficiency is being monitored by the iodine deficiency cell and by marketing iodized salt.

DISABLED POPULATION

Disability is an impairment, which makes an individual incapable of performing an activity as per the desired norms of normal individuals. Disabled persons are also termed as handicapped, challenged, invalid or sick. Disability not only leaves a deep impact on the psychological state of an individual- but also has very intense social and economic implications associated with it. The disabled have to be given equal rights with the rest of the people. Schemes for them should be such as to enable them play a productive role in the development of the state.

This empathetic view has been evident among the planners right from the Second Five Year Plan onwards. Special allocations have been made for the disabled population in the Five Year Plans for the country as well as for the state. The Sixth Five Year Plan (1980-85) allocated special scholarships ranging from Rs 15 to Rs. 100 per month for persons in the 6-30 years age group who were orthopaedically handicapped, or were deaf and dumb, or blind, and whose parents' or guardians' income was less than Rs 500 per month. A new scheme, Assistance to Disabled Persons- was introduced in the Seventh Plan (1985-90), which further strengthened the existing scheme by providing Rs. 50 per month per beneficiary. Subsequently it was during the Ninth Plan (1997-02) that disabled persons in the age group 16-55 years, who had no means of sustaining themselves, were given an amount of Rs 200 per month each.

³⁹ *Economic Survey of Punjab, 2000-2001.*

⁴⁰ *Economic Survey of Punjab, 2001-2002.*

The 1981 Census had collected information on the disabled population of India, which revealed that 1.2 persons per 1,000 population were disabled in Punjab as against 1.7 at the national level (Table 46). The 1991 Census did not collect any information on the disabled. The 2001 Census has made an endeavour once again to collect such information but the data are still awaited. The Persons With Disability Act 1995 has been introduced since 1 February 1996 to provide social security to the disabled persons. The Act envisages all-round welfare of disabled persons by providing them jobs, right to better living, rehabilitation services and also ensure that they have full protection of their rights and representation at all levels.

Prevalence of disability in Punjab: Figures reveal that Punjab with 1.2 persons per 1,000 population disabled was ranked 28th, while the neighboring state of Himachal Pradesh with a figure of 2.6 was ranked sixth as against the national figure of 1.7 according to the 1981 Census.

Table 46
Disability in Punjab and India

State/Country	Number of disabled per 1000 population	Totally blind	Totally crippled	Totally dumb
Punjab	1.176	46.81	33.05	20.14
Rural	1.376	47.77	32.29	19.94
Urban	0.644	41.32	37.40	21.28
India	1.709	42.78	32.49	24.73
Rural	1.933	43.77	31.43	24.80
Urban	0.977	36.34	39.43	24.23

Source: Census of India, 1981, *The Physically Handicapped, Report & Tables. Series-1, India, Part VII-B.*

The proportion of totally blind among the disabled was higher (48%) than the totally crippled (32%) and totally dumb (19.9%) in the rural areas of Punjab. This was true for urban areas as well. At the district level, in Patiala and Rupnagar, two out of every five disabled were blind as against three out of every five in Kapurthala (Table 47).

Table 47
District-wise Handicapped Population by Type of Disability (1981 Census)

District	Percent Blind	Percent Crippled	Percent Dumb
Gurdaspur	42.33	32.76	24.91
Amritsar	46.86	33.89	19.24
Firozpur	44.21	34.39	21.40
Ludhiana	44.39	34.25	21.36
Jalandhar	52.41	27.18	20.41
Kapurthala	59.68	25.77	14.55
Hoshiarpur	45.32	28.20	25.26
Rupnagar	41.33	31.34	27.32
Patiala	41.29	34.48	24.23
Sangrur	50.26	34.57	15.17
Bhatinda	49.80	33.02	17.18
Faridkot	46.29	40.18	13.53
Punjab	46.80	33.05	20.13

Source: *The Physically Handicapped, Report & Tables. Census of India, 1981, Series-1, India, Part VII-B.*

Measures to control trachoma began from the Fourth Five Year Plan (1969-74) onwards. when it was proposed that the Trachoma Control Programme would be started in Punjab on the recommendation of an ICMR study which had reported that 80 per cent of the

disabled suffered from trachoma in the state. Measures at the state level achieved 90.1 per cent of the target for administering prophylaxis against blindness due to Vitamin-A deficiency in 1982-83 (*Year Book*, 1983-84). This went up to 97 per cent in 1998-99 (Department of Health, Government of Punjab). Cataract surgery to combat blindness had been consistently exceeding the target between 1984 and 1997. An inter-state comparison shows that Punjab tops the list in the percentage of cataract operations conducted. Likewise, cataract surgery rate per lakh population has also been the highest in Punjab (*Health Information: Punjab (1991) and India (1997 and 1998)*).

The proportion of disabled population in rural Punjab was the highest among all the states of India as reported by the 36th and 47th rounds of National Sample Survey. It was among the top five states in the number of disabled in urban areas. The NSSO 1991 data reveal that hearing, speech and locomotor disabilities were prevalent more among males in both rural and urban areas of the state, while the proportion of blind females was more in urban Punjab.

During 1999-2000, the Department of Health and Family Welfare, Punjab Government, carried out a door-to-door survey to ascertain the exact number of disabled persons in all the districts of Punjab. It was found that of the total population of the state 1.1 per cent were disabled, 0.1 per cent mentally handicapped, 0.23 per cent visually handicapped (low and blind), 0.10 per cent hearing and speech handicapped and 0.61 per cent suffered from locomotor disability (Table 48). The National Sample Survey (1983 & 1994) has confirmed these findings on locomotor disability, particularly among males and in rural Punjab. The National Family Health Survey (1992-93) too has confirmed the findings that locomotor disability was the highest among males in rural Punjab. Thus, a need to formulate more effective strategies to cope with locomotor disability is imperative.

Table 48
District-wise Disabled Persons in Punjab, 1999-2000

District	Mentally Handicapped	Blindness	Hearing & Speech	Locomotor	Total
Amritsar	0.30	0.56	0.18	0.42	1.48
Bathinda	0.18	0.39	0.08	0.48	1.15
Fatehgarh Sahib	0.07	0.14	0.17	0.79	1.19
Faridkot	0.02	0.03	0.02	0.56	0.64
Ferozpur	0.00	0.00	0.00	0.36	0.36
Gurdaspur	0.01	0.00	0.01	0.34	0.37
Hoshiarpur	0.01	0.10	0.00	0.02	0.15
Jalandhar	0.03	0.05	0.03	0.32	0.44
Kapurthala	0.07	0.35	0.11	3.29	3.82
Ludhiana	0.10	0.20	0.21	0.77	1.30
Mansa	0.24	0.95	0.50	1.21	2.92
Moga	0.06	0.14	0.08	1.06	1.36
Muktsar	0.11	0.74	0.20	0.66	1.72
Nawanshahr	0.03	0.05	0.02	0.45	0.57
Patiala	0.09	0.10	0.07	0.80	1.03
Rupnagar	0.05	0.03	0.05	0.32	0.47
Sangrur	0.09	0.33	0.08	0.51	1.02
Punjab	0.09	0.23	0.10	0.61	1.05

Source: Department of Social Security and Women and Children Welfare, Government of Punjab (1999-2000)

District-wise state of disability reveals that Amritsar has the highest percentage of persons suffering from mental disability. It has the only mental hospital in Punjab, opened in 1947. Mansa district reported the highest number of visually and hearing/speech disabled persons (Table 48). Kapurthala district reported the highest percentage of locomotor disability. There are a number of voluntary organizations and NGOs working for the welfare of the disabled in different districts of Punjab, but none of them is listed from Mansa with the Department of Social Welfare, Punjab.

Government Initiatives

Schemes being implemented in Punjab for the disabled include assistance for educational support materials, disability pensions, grant to government institutions, transport subsidies and miscellaneous expenses. According to the guidelines of the Government of India, the Red Cross Society, Rupnagar, has been declared as the state resource centre (SRC) for the purpose of implementation of the National Programme for Rehabilitation of Persons with Disabilities Scheme. Aid and distribution of appliances to patients suffering from different type of disabilities is being undertaken through the District Disability Rehabilitation Centres at Patiala, Ferozpur and Sangrur districts of Punjab

In addition, the Ministry of Social Justice & Empowerment, Government of India, has sanctioned the National Programme for Rehabilitation of Persons with Disabilities in districts Rupnagar and Sangrur. It aims to provide comprehensive services, which include prevention and early intervention by providing medical care, aids and appliances, education, non-vocational and vocational training, economic rehabilitation and integration of persons with disabilities in rural areas in the society. The Ministry of Social Justice & Empowerment, Government of India, has sanctioned a Regional Spinal Injuries Centre in Punjab.

The National Mental Health Programme was initiated in 1982 in an effort to help the mentally challenged population in the state. There have been continuing efforts through the Five Year Plans to upgrade the Mental Hospital at Amritsar. Efforts to take care of the mentally disabled, according to the Mental Health Act, 1987, are the thrust areas of the Tenth Five Year Plan in Punjab too.

The National Programme for the control of blindness was launched as a 100 per cent centrally sponsored programme in 1976, addressed to nutritional blindness due to vitamin-A deficiency and cataract-related blindness. This programme has been carried forward in the same spirit by the Health Department and with due support from private, voluntary and NGO sectors. The Government, Lions and Rotary Clubs and Medical Colleges, such as CMC, Ludhiana, organize free eye camps to conduct eye check-ups and perform cataract operations.

There are 30 homes/schools for blind, deaf and dumb and mentally retarded persons in Punjab run by the state government and NGOs. In all, 33 voluntary organizations are working for the welfare of the handicapped under the PWD Act 1995 (Department of Social Welfare, Government of Punjab). The role of NGOs, especially in performing cataract operations in the state is an encouraging sign.

HEALTH CARE PROVIDERS' PERSPECTIVE

To understand the specific health needs of Punjab, and to improve its health status, in-depth interviews were conducted with some of the Civil Surgeons, District Immunization Officers, District Family Welfare Officers and District Health Officers. A few suggestions that emerged from the discussion are as follows:

- Most of the health care providers feel that the existing infrastructure is sufficient to provide the best of MCH and EPI services. What is lacking is the work culture. Often there is no accountability for failures. The reason for non-performance is lack of political and administrative will. Strict action should be taken against the defaulters to curb such practices as absenteeism. Usually, if a case is reported, politicians hush it up.
- Political interference in postings, internal adjustments and deputations should be eliminated, so that every medical person is put to maximum use. Mismatching of posts should be ended and persons placed in their proper field, e.g., posting a pharmacist in place of a staff nurse leads to bad precedence and inefficiency.
- In many instances, sophisticated equipment and machinery are not put to proper use and at times not even installed. Rationalizing postings of specialist doctors would help in proper utilization of sophisticated equipment and provide job satisfaction.
- In order to reduce the financial burden of the state government, it has been suggested that all diagnostic facilities, such as laboratory tests, X-rays, MRI, ECG, should be handled by the private sector at government-approved rates. This will also result in the co-ordination of the two sectors. Recently, Punjab Health Systems Corporation has opened its doors to the private sector and has come out with a novel experiment to engage medical officers, anesthetist, gynecologists, radiologist, staff nurses and Auxillary Nurse Midwives (ANMs) on a contract basis to handle emergencies. The success of this model is yet to be assured.
- With the mushroom growth of small nursing homes, often with a husband wife team, malpractices such as referrals, unnecessary diagnosis, fee-splitting, have started in most of the districts in Punjab. It is overwhelmingly believed that most of these nursing homes are fleecing the poor patients. In this regard, it is strongly felt that the Nursing Home Registration Act should come into force with immediate effect. Government should also be empowered to monitor the functioning of all these institutions.
- In order to improve institutional deliveries in the state, it is emphasized that all the staff nurses, lady health visitors, and multipurpose health workers must stay at places of their postings and be available for deliveries. There is need to provide 24 hours specialists, services at the first referral units (FRU), to enhance institutional deliveries, emergencies, obstetric services, and emergency neonatal services. Availability of comfortable residential premises to the medical/para-medical staff would enhance the delivery of quality health services to the community at large.
- Often lack of medicine supply is attributed to insufficient clinical services. Such medicines should be provided in plenty to strengthen the curative services. Supervision in the field should be strengthened. For this purpose, additional drivers, vehicles and provisions for additional expenses on POL should be permitted.

- Optimizing the existing rural health infrastructure in the state is a major challenge. Current vertical intervention programmes like TB, Malaria, or special programmes for STD and AIDs management should be brought under primary health care, in order to stop the lopsided management of health problems.
- Since different districts have different problems, district health plans would be useful for decentralized planning.

CONCLUSIONS

Development of the health sector in India during the last 50 years has been 'through planning special programmes for discreet interventions and then "integrating" them into packages...Practice of the concept of integration of preventive, promotive and curative services in this manner has been one of the major causes for the failure of the health care system.'⁴¹. Such attempts at integration have resulted in widening disparities between the demand and supply of health services. Primary health care, particularly in rural areas, has been focusing largely on preventive aspects of health care, such as family planning, immunization, and malaria surveillance work and ignoring the curative aspects.

During the different five-year plans and annual plans, the focus of Punjab Government has largely remained on strengthening the health infrastructure in the form of buildings, machinery, equipment and manpower for primary health care. The state has not made efforts to establish a strong health-management information system, which is extremely important for setting need-based priorities. Moreover, the state has not made enough efforts to establish referral linkages, management of life-style diseases, such as diabetes, cancer and cardiovascular diseases, regulate private health care services, and to involve the voluntary sector in different health programmes.

There seems to be a strong preference in the state for availing treatment from the private sector, in both rural and urban areas. The main factors helping the growth of the private sector are availability of medical facilities at all hours, specialized skills and technology, experience and promotional efforts. Despite the higher cost of establishment, the private sector in Punjab is posing a challenge to the public sector by providing services at par with it for non-hospitalized illness episodes and at a slightly higher cost for hospitalized illness episodes. The cost of treatment in the private sector is much cheaper in Punjab than in India. Less people in Punjab prefer to obtain free treatment in government or private/voluntary hospitals than in the rest of India. It is felt that the unregulated growth of the private sector has resulted in widening disparities in affordability, and such malpractices as mushrooming growth of diagnostic facilities, fee-splitting practices, etc.

Despite the quantitative increase in health institutions in Punjab, the status of antenatal, natal and post-natal cares remains inadequate. The state has a small number of institutional deliveries, resulting in higher still-births and infant mortality and low breast-feeding practices. There is a rise in the number of caesarian section deliveries, particularly in urban areas of the state. Problems related to menarche, menopause and infertility are neglected areas. The nutritional status of women and children in Punjab reveals high anaemia and obesity levels. As far as the disability patterns are concerned,

⁴¹ Ritu Priya, 'Dubious Package Deal: Health Care in Eighth Plan', *Economic and Political Weekly*, August 18, 1990, p. 1820

locomotor disability among males in Punjab is a matter of concern. Despite the fact that women-centered health programmes in the state have been able to provide health services, their dependence on others for seeking secondary health services is a matter of concern for the future.

VISION AND STRATEGIES FOR FUTURE

Morbidity is inevitable and health-care facilities are its natural concomitant. When a person visits a health care facility, he is already in distress. He looks forward to a system of health care that responds quickly to his needs and reduces his physical, financial and mental pressure. The vision of Punjab, as we foresee, goes a step further than the Government of India's goal of 'Health for All'. A distinct vision of health aspires for a generally healthy population, free from the impact of communicable and non-communicable diseases, with client friendly manpower in health and family welfare centres. Besides the continuation of the usual preventive health care measures, the state must ensure provisions for the availability of quality health care services (including secondary and tertiary health care services) to everyone, including the underprivileged. The health care system of the future should be more scientific and technologically advanced. Better health care services in future are envisaged, with the introduction of selected health sector reforms, such as integration of public and private sectors, formulation of rules for regulating the private sector, introduction of sustainable approaches towards treatment and cure for communicable diseases, particularly HIV/AIDS, and a viable health insurance policy. We also look forward to immediate state interventions in the form of setting up special clinics for the welfare of the vulnerable sections (children, adolescents, women, and the elderly), and bringing about an attitudinal and behavioural change in the removal of existing socio-cultural practices, particularly attached to the reproductive health of women. Revitalizing the existing health care institutions through reforms in governance (with greater involvement of Panchayati Raj Institutions and urban local bodies), and provision of additional funding on a self-sustainable basis (levying of user charges in consultation with the representatives of PRIs and ULBs) would help us come out of administrative problems and resource crunch. We also foresee a greater inter-sectoral and inter-departmental co-ordination, which would not only ensure effective and optimal utilization of existing and future health care programmes, but also result in an increased public awareness towards healthy practices. Periodic assessment of health problems and needs of the state is expected as an essential prerequisite for assessing future requirements. To achieve the above, the following policy interventions are suggested:

1. The first priority for Punjab is to have a State Health Policy, clearly listing out future health care requirements. The state is likely to face newer morbidity patterns emerging, because of rising population, in-migration, urbanization and industrialization.
2. The existing number of medical institutions in the state is sufficient to meet the needs of the people, but they have to be brought to a reasonable norm of efficient functioning. Such shortcomings as inadequate para-medical staff, buildings and equipments must be overcome. It is overwhelmingly felt that with rising urbanization, impetus needs to be given to secondary and tertiary care hospitals, growth of which has not kept pace with the changing times and changing disease patterns.
3. Focused attention needs to be given to curative aspects of health care, particularly in a state like Punjab where the share of the number of cases treated in the public sector has gone down considerably. Strengthening the existing

public health services and widening their network through the involvement of private practitioners, voluntary non-governmental organizations and research institutions would improve the health care services in the state. Trained manpower from different multipurpose health worker's schools (on a contractual or voluntary basis) in the state could be utilized to promote health care at the grassroots.

4. In tune with the objectives of NHP-2002, convergence of all national programmes on health, such as malaria, tuberculosis, HIV/AIDS, RCH and universal immunization programme, under the management of autonomous bodies for overall implementation, is desirable in the state. Effective implementation by such bodies would not only reduce the proportion of communicable and non-communicable diseases in the state but also reduce the burden of the state government to enable it to plan alternative strategies.
5. Special strategies need to be planned for such districts as Amritsar, Ludhiana, Patiala, Jalandhar and Nawanshahar, which have reported a higher number of HIV positive cases in the state. The present Voluntary Counselling and Testing Centres (VCTC) for HIV/AIDS testing in three medical colleges/hospitals, i.e., Faridkot, Patiala and Amritsar, are grossly inadequate. Such testing facilities should be made available at all Civil Hospitals.
6. It is very important that professional medical bodies and the Government of Punjab evolve some rules and regulations and develop appropriate strategies to regulate the private sector. It is important to have directives on the manufacturing, sale, quality and prescription of pharmaceutical drugs on the one hand, and medical and clinical practices, including license to practice, basic code of conduct, negligence and consumer complaint on the other. The rating of private clinics, nursing homes and hospitals based on physical facilities, manpower, equipment and technology would be useful.
7. With the rising medical costs, there arises the question of the available financing options. Hospitalized treatment in both the public and private sectors is very expensive and leads to loss of life-long savings, leaving no money for future social security. It is suggested that the Punjab Government should work out modalities for a viable health insurance policy to meet rising health costs in public and private sectors.
8. Decentralization of powers to Panchayati Raj Institutions (PRIs) in Punjab, according to the 73rd Amendment of the Constitution, to identify their area-specific priorities, develop programmes and mobilize resources, is an obvious measure. This would not only revitalize the faith of the community in their chosen leaders, but also ensure effective administration (accountability, transparency and efficiency) of health services. Imparting training and sensitization of elected PRI representatives on women's and children's issues is important.
9. Special clinics should be established in each district to deal with problems related to menarche, menopause, reproductive health and infertility in the state.
10. A nutritional awareness programme is suggested, on the pattern of the school health check-up programme. Agro-processing industrial units in the state should be encouraged to produce micronutrient-fortified food items.
11. Special emphasis needs to be given to preventive measures, such as vaccination against communicable diseases and identification of high-risk pregnancies to detect deformities and disabilities. Impact of urbanization brings along with it mental stresses and strains. Efficient strategies need to be evolved to combat life-stresses, which lead to accidents, burns and suicides. More trauma wards need to be established in Punjab to meet such eventualities. Mental health specialists at each hospital can play a vital role in maintaining and upgrading the state of mental health of the people of Punjab. Guidance on nutritional intake of

food to prevent deficiency-induced disabilities needs to be spread. Government should make infrastructural changes to make the life of the disabled convenient. Work places transportation, traffic signals and roads have to be made more handicapped-friendly.

12. A number of primary studies should also be undertaken, through autonomous research institutions, to assess the health needs of the state.
13. Last but not the least, a proper computerized health-management information system should be developed for immediate access to information on health and other such indicators as nutrition and disability at the grassroots level. This will largely help in planning area-specific and need-based policies and programmes in future.

A few concerns, which are outside the domain of this chapter, but constitute an integral part of the healthy growth of the human mind and body are environment and occupational health adequate availability of drinking water, hygienic living conditions, nutritious food, removal of drug addiction and other health hazards. Excessive use of alcohol is a deterrent to growth, particularly in an agrarian society like Punjab. The state has to design the future of next generation by ensuring minimization of alcoholism and drug addiction. We visualize the need of extending the scope of interconnectivity and interdependence of the state within the region to ensure a disease free, and an environmentally clean society.

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Chapter 11

EDUCATION

Education is a core sector for achieving the objective of employment, human resource development and bringing about much needed change in social environment, leading to overall progress through efficient use of resources. An appropriate education system cultivates knowledge, skill, positive attitude, awareness and sense of responsibility towards rights and duties and imparts inner strength to face oppression, humiliation and inequality. (*Ninth Five Year Plan, 1997-2002*)

Education, being a vast subject, the present chapter has been divided into different parts. There is a section on literacy followed by an overview of a school education and higher education in Punjab. Effort has, however, been made to retain the linkages between the different sections wherever possible.

LITERACY

A person who is able to read and write with understanding in any language is recorded as literate. Literacy is the best possible barometer to judge the level of educational awakening in a state, leading to a minimum capacity for self-learning. In Punjab, the literacy rate has been rising. It was 58.51 per cent in 1991 and increased to 69.95 per cent in 2001, an increase of 11.44 per cent points during the last 10 years.

Table 1
Literacy Rate, Punjab (1991-2001)

Years	Rural	Urban	Total	Male	Female
1991	52.77	72.08	58.51	65.66	50.41
2001	65.16	79.13	69.95	75.63	63.55

Source: *Census of India (Punjab), 1991-2001*

Note: Literacy rate have been worked out by excluding 0- 6 age-group

Punjab has fared well in reducing the gap between male and female literacy, which decreased from 15.25 per cent in 1991 to 12.08 per cent in 2001. Male literacy rate increased from 65.66 per cent in 1991 to 75.63 per cent in 2001 and female literacy rate from 50.4 per cent to 63.55 per cent. Female literacy rate has increased by 13.14 per cent points and male literacy by only 9.97 per cent points during the last decade. Female literacy rate in Punjab is also considerably higher than that of India where 54.16 per cent of the females are literate.

According to the 2001 Census, rural literacy rate is 65.16 per cent and urban 79.13 per cent signifying that the gap is not very wide. There has been a reduction in the rural-urban literacy gap, from 19.31 per cent points in 1991 to 13.97 per cent points in 2001. In spite of these positive trends, there are still 94.35 lakh (including 0-6 population) illiterate in the state (*Census of India, 2001*). It is also a matter of great concern that in spite of having improved its literacy rate figure, the rank of Punjab went down from the 12th position in 1971 to the 16th in 2001, when compared to other states and UTs in India. At present, Kerala has the highest literacy rate of 90.92 per cent while Bihar has the lowest of 47.53 per cent.

Table 2
States and Union Territories Ranked by Literacy Rate – India 2001

States/UTs	Literacy Rate	Rank by Literacy Rate
India	65.38	
Kerala	90.92	1
Mizoram	88.49	2
Lakshadweep	87.52	3
Goa	82.32	4
Delhi	81.82	5
Chandigarh	81.76	6
Pondicherry	81.49	7
Andaman & Nicobar Island	81.18	8
Daman & Diu	81.09	9
Maharashtra	77.27	10
Himachal Prudish	77.13	11
Tripura	73.66	12
Tamil Nadu	73.47	13
Uttaranchal	72.28	14
Gujarat	69.97	15
Punjab	69.95	16
Sikkim	69.68	17
West Bengal	69.22	18
Manipur	68.87	19
Haryana	68.59	20
Nagaland	67.11	21
Karnataka	67.04	22
Chhatisgarh	65.18	23
Assam	64.28	24
Madhya Prudish	64.11	25
Orissa	63.61	26
Meghalaya	63.31	27
Andhra Prudish	61.11	28
Rajasthan	61.03	29
Dadra & Nagar Haveli	60.03	30
Uttar Prudish	57.36	31
Aruncahal Prudish	54.74	32
Jammu & Kashmir	54.46	33
Jharkhand	54.13	34
Bihar	47.53	35

Source: *Census of India, 2001*

Note: The literacy rate pertains to percentage of total literates to total population excluding 0-6 population

Further, within Punjab, district-wise data reveal wide disparity in literacy rates.

Table 3
Total Literacy and Female Literacy by Districts of Punjab, 2001

District	Literacy Rate	Female Literacy
Punjab	69.95	63.55
Hoshiarpur	81.40	75.56
Rupnagar	78.49	71.74
Jalandhar	77.91	72.93
Nawanshahr	76.86	69.52
Ludhiana	76.54	72.11
Gurdaspur	74.19	67.31
Fatehgarh Sahib	74.10	68.60
Kapurthala	73.56	67.90
Patiala	69.96	62.94
Amritsar	67.85	61.41
Moga	63.94	58.96
Faridkot	63.34	57.09
Bathinda	61.51	53.76
Ferozepur	61.42	52.33
Sangrur	60.04	53.29
Muktsar	58.67	50.59
Mansa	52.50	45.07

Source: *Census of India (Punjab), 2001*

Table 3 shows that Hoshiarpur district is the most literate in the state, with a literacy rate of 81.40 per cent, followed by Rupnagar (78.49%), Jalandhar (77.91%), Nawanshahr (76.86%) and Ludhiana (76.54%). All these districts have at least three-fourths of their population literate. On the other hand, Muktsar has a literate population of only 58.67 per cent and Mansa at the bottom only a little over one-half (52.50%). The major reason for high literacy in the Doaba region is that educational facilities started early in this area. The per square availability of primary schools is the highest in Hoshiarpur district. The high literacy rate is also the outcome of the culture and nature of work of the people in the Doaba region. The economy in this area is largely dependent on the service sector rather than primary sector.

Female literacy rate in Punjab is 63.5 per cent. It is the highest in Hoshiarpur (75.56%), the lowest in Mansa (45.07%) and just above the midway mark in Muktsar (50.5%) and Ferozepur (52.33%). Further, there are nine districts in Punjab with a lower female literacy rate than the state average. The literacy rate of the Scheduled Castes is even more dismal.

Table 4
Literacy Percentage of Scheduled Castes and Non-Scheduled Castes in Punjab, 1991

	Population	No. of Literates	Literacy % age
Total (SC + Non SC)	16975724	9932116	58.51
Male	9014582	5919225	65.66
Female	7961142	4012891	50.41
SC Population			
Total	4661746	1915554	41.09
Male	2495749	1243394	49.8
Female	2165997	672160	31.03
Non-SC Population			
Total	12313978	8016562	65.10
Male	6518833	4675831	71.7
Female	5795145	3340731	57.6

Source: *Census of India (Punjab), 1991*

Note: Literates have been worked out from total population, excluding 0-6 age-group

The literacy rate of the non-Scheduled Castes is quite high (65.10%) as compared to the Scheduled Castes (41.09%). The female literacy rate of the non-Scheduled Castes (57.6%) is almost double than that of the Scheduled Caste women (31.03%). Hence, it is obvious that the total literacy percentage of the state has been adversely affected by the Scheduled Caste population. The literacy rate of Scheduled Caste women is really pathetic in the pockets of Bathinda (12.84%), Faridkot (15.78%), Ferozepur (15.09%) and Sangrur (17.02%).

Government should, therefore, give priority consideration to improve the literacy rate of the Scheduled Castes and especially females in the identified pockets.

Adult Literacy

The adult education programme was being run under 100 per cent Centrally sponsored Rural Functional Literacy Programme and Social Education Scheme until the beginning of the nineties. After the abolition of these schemes in June 1991, the adult education programme remained neglected in the state for two to three years. It was again revived by NLMA and given a new name, Total Literacy/Post Literacy Programme.

Table 5
Adult Literacy Rate, Punjab (15+Population)

	1971	1981	1991	1998
Male	44.64	51.08	61.29	70.0
Female	24.19	32.81	43.39	55.0
Total	35.22	42.57	52.90	63.0

Source: NSSO, 1998 and Census of India (Punjab), 1971-1991

The data reveal that there are 37 per cent illiterates in the 15+age group. But in Punjab, state government programmes cater only to the 15-35 age group and not to the total illiterate adult population.

Table 6 gives the proportion of illiteracy in the 15-35 age group.

Table 6
Illiteracy in 15-35 Age Group in Punjab, 1971-91

Year	No. of Illiterates			Total Population			Percentage of Illiterates		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1971	962946	1263325	2226271	2260295	1998096	4258391	42.60	63.23	52.28
1981	1141858	1421027	2562885	3108584	2754113	5862697	36.73	51.0	43.72
1991	1060874	1375295	2436169	3747468	3370848	7118316	28.31	40.90	34.22

Source: Socio-cultural Tables, Census of India, (Punjab), 1971-91

It may be noted that the absolute number of illiterates in the age group 15-35 increased during 1971-81 but came down during 1981-91. The percentage of illiteracy has been declining consistently both for males and females. However, it is a matter of concern that there are still 24,36,169 illiterates in this age group.

The scheme of Total Literacy was started in Punjab during 1994-95 to impart functional literacy to illiterates of the age group 15-35. This was to be implemented by the Deputy Commissioner of each district through the Zila Sakhrata Samiti.

The scheme has three phases:

- 1) Total Literacy Campaign
- 2) Post Literacy Campaign
- 3) Continuing Education

Total Literacy Campaign (TLC)

The objective of this campaign is to provide basic knowledge of reading, writing and numerics. All 17 districts have already been covered under TLC in Punjab. Hoshiarpur, Faridkot (including Moga and Muktsar) districts have completed this campaign.

Of the total illiterates in the 15-35 age group in 1991, during enlistment under TLC, only 20,74,679 person were identified between 1994-98 and only 55.24 per cent enrolled.

Post Literacy Campaign (PLC)

The objective of this phase is to develop basic skills amongst neoliterates. There is a book called *Post Literacy Primer (PL-I)* which is taught during this programme. Six districts, namely, Hoshiarpur, Faridkot (including Moga and Muktsar), Ropar and Nawanshehar have been covered under PLC. Hoshiarpur and Faridkot (including Moga and Muktsar) districts have already completed this programme, but it is continuing in Ropar and Nawanshehar.

Continuing Education (CE)

During the Tenth Five Year Plan, it is proposed to introduce Continuing Education (CE) to impart functional literacy to all illiterates in the age group 15-35 years. For adult learners, only Hoshiarpur district has qualified for the CE programme. However, except for some districts, the TLC programme has not functioned well. It is going on at a very very slow pace. There has been no progress for the past 2-3 years in the Patiala, Fatehgarh Sahib and Gurdaspur districts. Post-literacy campaigns need greater emphasis to ensure the realisation of the gains of TLC. Withdrawal of school teachers, lack of funds and enthusiasm at all levels of society have been reported by most of the districts as the cause of the very slow pace or failure of the programme.

It is strongly recommended that there should be regular monitoring at the state and district levels. The adult literacy programme can now be merged with SSA for effective functioning and optimal utilization of resources, as there is a very easy convergence of adult literacy programmes with EGS (Education Guarantee Scheme), AIE (Alternative Innovative Education) under SSA.

SCHOOL EDUCATION: PRIMARY, ELEMENTARY, SECONDARY AND SENIOR SECONDARY

Relevance of Schooling

'Elementary education is the most crucial stage of education spanning the first eight years of schooling and laying the foundation for the personality, attitudes, social confidence, habits, learning skills and communicating capabilities of pupils. The basic skills of reading, writing and arithmetic are acquired at this stage. Values are internalized and environmental consciousness sharpened. The crucial role of universal elementary education for strengthening the fabric of democracy, through provision of equal opportunities to all for the development of their inherent individual potential, was accepted from the very inception of our Republic in Article 45 under the Directive Principles of State Policy in the Constitution, which provides for free and compulsory education to all children until they complete the age of 14 years. This was iterated in

1968, by the Resolution on the National Policy on Education'. (*Challenge of Education, a policy perspective*, 1985)

The famous Unnikrishnan Case declared primary education a fundamental right. The 93rd Amendment added a new clause to make elementary education a fundamental right. A state subject so far, education was brought on the Concurrent List.

Secondary and Senior Secondary levels of education are also considered very essential in a child's life. Classes XI and XII give the children the choice of joining different courses, including science, commerce and mathematics to facilitate their entry into the world of work, as this stage is terminal in nature and has been considered a turning point for the child to move towards a place of work.

The present section provides an overview of the current quantitative and qualitative status of school education in Punjab, in the light of the major goals of education identified by the national policy, along with some interventions/recommendations for policy alternatives in education. The major variables, which have been described here, are: growth of institutions by levels, enrollment, retention and dropout rate, quality of school education, non-formal education and infrastructure. This section also discusses educational policy/plans and expenditure.

Problems of School Education in Punjab

Punjab is in the most unenviable position with respect to literacy and education. There has been an increase in total literacy rate by 11.4 per cent points between 1991-2001. Male literacy has improved by 9.97 per cent points, female literacy by 13.1 per cent points and rural literacy by 12 per cent points during this period. Although the absolute number of illiterates has decreased from 70.43 lakh in 1991 to 63.80 lakh in 2001 (excluding the 0-6 age-group), the number continues to be alarmingly high.

The state has universal access at the primary level. It has a significantly high ratio of primary sections. Except some remote areas/new habitations with small populations, there is a government primary school in almost every village. However, there are 61 per cent villages without a middle section. In fact, 16 per cent habitations do not have an elementary school even within the norm of 3 km. Nearly one-fourth of the children are either not enrolled in schools or are in unrecognized schools. Further, there are still about 2.97 lakh children of 6-14 age group who are out of school. Among those enrolled in schools, the dropout rate is very high. Out of 100 children enrolled in class 1, only 22 reach senior secondary level. The condition of facilities and infrastructure available in the primary schools is pitiable. More than 1,000 schools do not have buildings of their own. Even such basic necessities as drinking water and toilets are conspicuous by their absence in a large number of schools. Students do not have proper sitting arrangements and teachers do not have sufficient numbers of black-boards to teach and chairs to sit on.

Apart from physical inputs, the most glaring weaknesses are lack of motivation, outdated teaching methodology and unskilled teachers. Although Punjab has a respectable teacher-pupil ratio of about 1:42 at primary level, a one-way dialogue between teachers and students has remained the norm and learning by rote the only methodology. The prevalent teaching-learning process is inadequate for the first generation students, who are not supported by the home environment. Further, there is lack of relevance of

education to day to day life. A commitment to create specific and stated levels of learning and competence at different stages of education, is absent. At present, there is no reliable system of concurrent monitoring or evaluation at the state level. Planning is vague and indicative, with no commitment to fulfillment of stated specific targets. The main stress has only been on formulation of schemes and almost no action-research to discover what will work. Total lack of accountability towards pupils and their performance is further hindering educational development. The time has indeed come for introspection and diagnosis, consolidation of existing resources and planning for bridging the gaps.

Education Policy and Plans

The Government of India's National Policy on Education, 1986 (modified in the year 1992) is a forthright statement on education as an empowering agent.

While making certain modifications in NPE (1986) in 1992, the Central Government took a significant decision to direct the State Governments to have their own state programmes of action for implementing the thrust areas of the policy, keeping in view local conditions as also the spirit of NPE.

NPE gives priority to universalization of elementary education (UEE) and identifies it as the major goal. It, *inter alia*, lays emphasis on the following aspects of education:

- (i) universal access;
- (ii) universal enrollment and universal retention of children upto 14 years of age;
- (iii) a substantial improvement in the quality of education.

The policy relating to secondary education implies:

- (i) Providing access to secondary schools in the unserved areas.
- (ii) Establishing open schools for children who cannot attend full-time schools.
- (iii) Enhancing the options by ensuring a vocational stream along with the three streams of humanity, science, commerce in higher secondary schools.
- (iv) Consolidating the facilities:
 - a) Improvement in curriculum and evaluation methods.
 - b) Improvement in infrastructural facilities, such as building, classrooms and playgrounds, etc.

Adhering to the national policy, Punjab aims to achieve the goal of universalization of elementary education. For this, separate Directorates of Primary Education and Secondary Education have been set up.

Till now, we had been adhering to the national policy. This is, however, for the first time that Punjab has initiated its own policy wherein the major objective is to universalize implementation of the national policy. A perusal of the Five Year Plans of Punjab reveal that although the First Five Years Plan did recognize quality as the key area of concern for educational reforms, the pressures for expansion were such that most of the development expenditure was consumed for opening new schools and appointment of additional teachers, rather than in making concentrated efforts to improve the quality of education. Moreover, opening of new schools and appointment of additional teachers were more attractive as a populist measure. Statistically too, the data on the number of schools reveal that the maximum increase was during 1970-80.

It was only during the Seventh Plan (1985-90) that the focus shifted from expansion and upgradation of education to consolidation of qualitative improvement. However, during the Ninth Plan (Punjab), the main focus was on both qualitative improvement and expansion and upgradation of schools, to meet the target of universalization. During the Tenth Plan, it is envisaged that the main stress will be laid on providing/upgrading infrastructural facilities in the existing schools by providing buildings/furniture. It will also cater to decentralization to the village level, training of manpower, which includes teaching personnel and leadership. The focus of the state administration in the Tenth Plan is mainly on improving the quality of education.

A study of the outlay and expenditure in different five-year plans on general education (all stages) reveals picture shown in Table 7.

Table 7
Punjab: Outlay and Expenditure in Different Five Year Plans on General Education
(Rs. in lakh)

Plans	Approved outlay on education	Percentage of total outlay	Expenditure on Education
Fourth Five Year Plan (1969-74)	2100.00	7.16	2307.69
Fifth Five Year Plan (1974-78)	4327.00	4.21	3056.43
Sixth Five Year Plan (1980-85)	5300.00	2.71	5470.58
Seventh Five Year Plan (1985-90)	7637.00	2.32	6371.27
Eighth Five Year Plan (1992-97)	21683.00	2.62	23714.82
Ninth Five Year Plan (1997-2002)	41310.49	2.89	60947.61 (1997-2001)
Tenth Five Year Plan (2002-2007)	141089.77	6.07	-

Source: *Statistical Abstract of Punjab (1970-2002)*

The data reveal that the present outlay has come down to 2.89 per cent in the Ninth Plan from 7.16 per cent in the Fourth and 4.21 per cent in Fifth Plan. The percentage of the total outlay to the education sector had been consistently decreasing until the Seventh Plan. In the Eighth and the Ninth Five Year Plans, although there has been a marginal increase in the outlay i.e. it increased to 2.62 per cent in the Eighth Plan and 2.89 per cent in the Ninth Plan, but the percentage is still very low as compared to the Fourth Plan and even the Fifth Plan. Hence, it is obvious that the education sector is not being given as much priority as it was given earlier. However, the expenditure during the Ninth Plan, i.e., from 1997 to 2000 has really exceeded the given outlay. Rs.60,947.61 lakh has been spent on education in 1997-2001 as against the allotted amount of Rs. 41,310.49 lakh. The main reason was the implementation of the recommendations of the Fifth Pay Commission, wherein again the major amount was spent on salaries/state liabilities rather than educational development. In the Tenth Plan a major jump to Rs. 1,41,089.77 lakh is envisaged for the education sector and the state government claims that besides meeting the state liabilities, during this plan period, care is being taken to ensure that the money released is utilized to meet the objectives of development.

Table 8
Expenditure and Budget of School Education in Punjab, 1992-2000
Primary Education

Year	Plan		Non Plan		Total Budget Allocation	Total Expenditure	Expenditure on Salaries	(Rs. In Lakh) % Expd. on Salaries
	Budget Allocation	Expenditure	Budget Allocation	Expenditure				
1992-93	562.00	486.00	19598	19429	20160.00	19915.00	19509.25	97.97
1993-94	288.75	157.91	20186	20072	20474.75	20229.91	20129.91	99.51
1994-95	319.00	293.65	23999	22389	24318.00	22682.65	22437.65	98.92
1995-96	120.92	59.06	26265	26089	26385.92	26148.06	26148.06	100.00
1996-97	1176.75	1026.11	30378	30376	31554.75	31402.11	30452.11	97.00
1997-98	1278.14	1053.77	38264	38262	39542.14	39315.77	38351.55	97.55
1998-99	611.61	607.61	45830	45822	46441.61	46429.61	45912.44	98.89
1999-2000	1106.28	794.21	56066	55925	57172.28	56719.21	56054.71	98.83
2000-2001	1574.52	1092.10	62552	59661	64126.52	60753.10	60067.26	98.87

Year	Plan		Non-Plan		Total Budget Allocation	Total Expenditure	Expenditure on Salaries	% Expd. on Salaries
	Budget Allocation	Expenditure	Budget Allocation	Expenditure				
1992-93	3301.02	2017.36	29499.35	27796.28	32800.37	29813.64	24682.86	82.79
1993-94	6099.28	4048.99	29253.09	29956.48	35352.37	34005.47	28861.02	84.87
1994-95	6746.5	5237.00	30411.32	32700.33	37157.82	37937.33	32455.53	85.55
1995-96	9058.5	5449.66	37462.26	38479.90	46520.76	43929.56	38366.71	87.34
1996-97	10691.5	6718.24	45019.03	47133.64	55710.53	53851.88	47301.86	87.84
1997-98	12391.38	1070561.61	51772.32	62042.91	64163.70	72748.52	65294.53	89.57
1998-99	18270.7	16806.02	70762.12	74286.95	89032.82	91092.97	81822.14	89.82
1999-2000	22620.56	19809.27	86215.21	74514.70	108835.77	94323.97	85166.89	90.29
2000-2001	27916.35	19322.05	95265.98	88930.90	123182.33	108252.95	97993.58	90.52
2001-2002	32897.58	22106.9	100299.70	96301.07	133197.28	118407.93	106663.86	90.08

Source: Directorate of Education, Punjab

In spite of the fact that educational expenditure continues to be the highest item next only to defence, the resource gap for educational needs is still one of the major problems. Punjab is spending 2.88 per cent of the SGDP on education in comparison to 3.62 per cent at the national level. However, this percentage is really less, as there was a clear indication in the NPE 1986 that the investment on education should reach six per cent of the national income.

Not only is the allocation for education very low, but, according to present data, 99 per cent of the expenditure at the primary level and 90 per cent at the secondary level are spent on salaries. The expenditure on salaries at the primary level has increased from 97.8 per cent in 1992-93 to 100 per cent in 1995-96. It dropped to 97 per cent in 1996 but has again increased and reached 99 per cent in 2000-01. At the secondary level, the expenditure on salaries has been consistently rising from 83 per cent in 1992-93 to 87 per cent in 1995, 89 per cent in 1998 and has finally reached 90 per cent in 2000-01. Such a high percentage of expenditure on salaries clearly reveals that very little is left for development of education itself.

Progress of Education at Different Levels

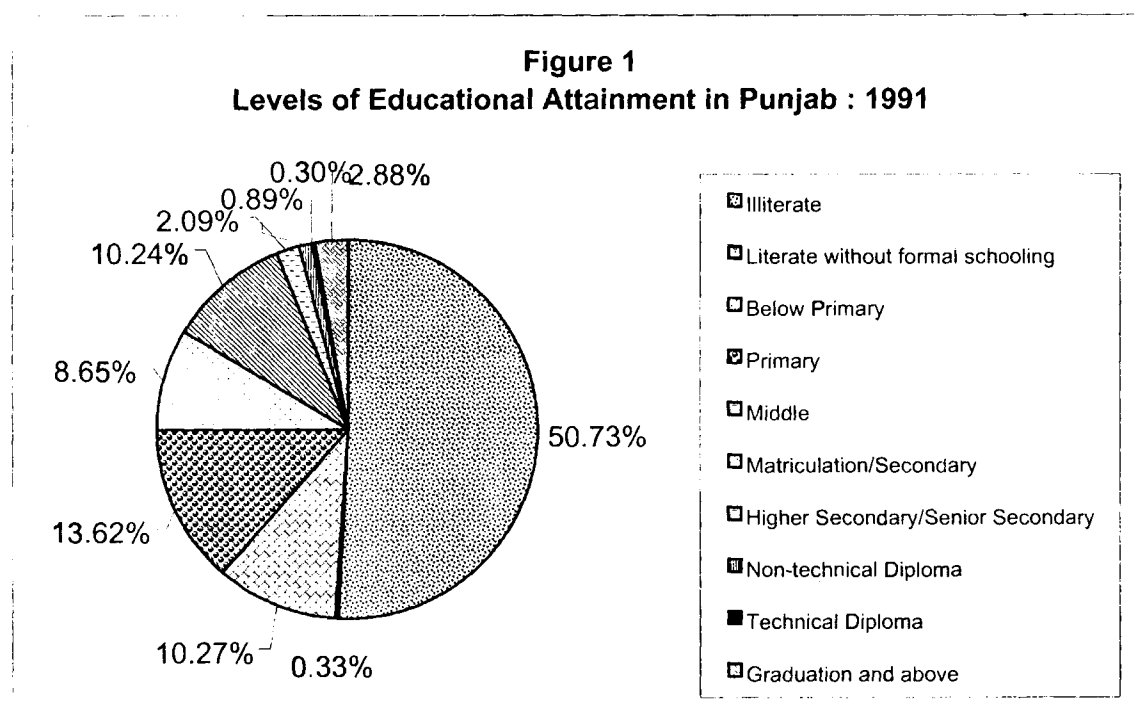
The overall educational profile of the population in Punjab is really disappointing, as reflected in Table 9.

Table 9
Educational Attainment in Punjab, 1991

Educational Level	Population	Percentage
Illiterate	10349853	51.02
Literate without formal schooling	67030	0.33
Below Primary	2094912	10.33
Primary	2772368	13.7
Middle	1797952	8.7
Matriculation/Secondary	2088856	10.3
Higher Secondary/Senior Secondary	430243	2.1
Non-technical Diploma	19894	0.9
Technical Diploma	70971	0.3
Graduation and above	589890	2.9
Total	20281969	100

Source: Socio-cultural Tables, Census of India (Punjab), 1991

Note: Based on total population



Source: Socio-cultural Tables, Census of India (Punjab), 1991

Note: Based on total population

According to the 1991 Census, 51 per cent of the population in Punjab were completely illiterate. Nearly one-fourth of the population had studied only up to the primary level or below, nine per cent up to the middle level and 10 per cent up to matriculation. Only three per cent of the total population had studied up to graduate level or above. These figures are alarming and show that the overall picture of education in Punjab is very poor. A major conclusion drawn from the above table is that if a child is ensured education till elementary level, enrollment at the secondary level is inevitable. Another fact revealed is the failure of the education system at the secondary level, as the desired dispersal to the various streams has not taken place, which is obvious from the low figures of diploma holders.

The status of education at different levels, i.e., primary, middle, secondary and senior secondary, has been discussed under the umbrella of the major goals identified by the National Policy of Education, i.e., to ensure access to school, universal enrollment and retention of children up to the age of 14 years and improving quality of school education.

MAJOR GOALS AND ACHIEVEMENTS

Goal I: Ensure Access to Schools

Current Status

In Punjab, the state government manages 90.8 per cent of the recognized educational institutions; nine per cent are non-government, aided and/or recognized institutions and only a negligible number comes under the control of the Centre. The number of non-governmental but recognized institutions is however higher in the case of high schools and senior secondary schools than primary and middle schools, i.e., one-fifth of the high schools and one-fourth of the senior secondary schools are non-governmental institutions. Punjab Government has made great strides in expanding access to education by opening new schools at all levels. The total number of schools increased from 8,891 in 1966-67 to 18,998 in 2001. The data reveal that the most massive expansion of schooling facilities took place during the 1970s-80s in Punjab, when the number of schools jumped from 9,394 to 16,050.

Although there has been a gradual increase in the number of institutions from the 1980s to 2000, the expansion has not been that significant as in the period 1970-80.

Table 10
Number of Institutions in Punjab as on 30.9.99

Type of School	Central Govt.	State Govt.	Non-Govt. (Recognized)	Grand Total
Primary	8 (0.06)	12175 (93.7)	813 (6.3)	12996
Middle	1 (0.03)	2390 (94.3)	143 (5.6)	2534
High	9 (0.4)	1746 (79.5)	441 (20.0)	2196
Sr. secondary (10+2)	46 (4.0)	831 (71.6)	284 (24.46)	1161
Total	64 (0.3)	17144 (90.76)	1681 (8.89)	18887

Source: *Educational Statistics at a Glance of Punjab (1999)*

Note: Figures in parentheses are percentages

Table 11
Number of Schools, Government and Non-Government (Recognized), 1966-2001

Type of School	1966-67	1969-70	1974-75	1980-81	1990-91	1992-93	1996-97	1999-00	2000-01
Primary	7002	7256	9335	12383	12379	12462	12613	12996	13076
Middle	866	959	1397	1498	1430	1429	2545	2534	2534
High	730	919	1275	1912	2249	2104	2159	2196	2199
Higher Sec/ Sr. Sec.	293	260	245	257	520	673	1134	1161	1189
Total	8891	9394	12252	16050	16578	16668	18451	18887	18998

Source: *Economic Survey of Punjab, 2001-02*

Table 12
District-wise Number of Villages with Schools

District	No. of villages surveyed	No. of villages having				Total upper primary sections (3+4+5)	Total secondary sections (4+5)
		GPS	GMS	GHS	GSSS		
		2	3	4	5		
Amritsar	1249	1216	217	165	64	446	229
Bathinda	302	294	73	83	61	217	144
Faridkot	198	195	77	41	18	136	59
Fatehgarh Sahib	437	416	65	40	24	129	64
Ferozepur	1079	1030	180	95	65	340	160
Gurdaspur	1555	1459	241	137	104	482	241
Hoshiarpur	1410	1202	172	141	92	405	233
Jalandhar	886	830	151	117	76	344	193
Kapurthala	588	518	108	66	45	219	111
Ludhiana	935	854	181	165	79	425	244
Mansa	242	238	95	47	20	162	67
Moga	313	307	69	83	57	209	140
Muktsar	251	248	75	69	38	182	107
Nawan Shehar	433	409	88	57	32	177	89
Patiala	1094	1042	167	110	73	350	183
Ropar	903	812	119	76	52	247	128
Sangrur	750	727	206	156	61	423	217
Total	12625	11797 (93.44)	2284 (18.09)	1648 (13.05)	961 (7.61)	4893 (38.76)	2609 (20.67)

Source: Tentative Data, Department of Education, 2002

- Note:**
- Numbers represent villages having the respective education facility so do not correspond with number of schools.
 - Upper Primary (classes 6-8) are run in GMS, GHS and GSSS so for the purposes of upper primary total of (3+4+5) represent upper primary section.
 - Secondary classes, i.e., (classes IX-X) are run in both GHS and GSSS. So the total of (4+5) represent number of secondary section.

The number of primary schools increased tremendously in the past. It rose to 7,256 in 1970 and reached 12,383 in 1980. At present it has already reached 13,076 (2000-01). The number of middle schools was 1,498 in 1980-81, increased to 2,545 in 1996-97, and is at present 2,534. High schools numbered 919 in 1969-70, 1,275 in 1974-75, 1,912 in 1980-81, 2,249 in 1990-91 and 2,199 in 2000-01. It is evident that the number of schools really increased only during 1970-80. Senior secondary schools too increased to 1,189 in 2000-01 from 520 in 1990.

The data of the survey conducted in 12,625 villages by the Education Department reveal that except for some remote/unserved areas, there is a primary school in almost every village. There is likelihood of shortage of primary schools in Mand/Kandi/Border and Bet areas of Punjab, because of their difficult terrain. However, at the other end, the data also show that there are only 39 per cent of villages, having elementary sections and only 21 per cent which have secondary sections.

Even if we consider the distance norm as laid down by government, there are only 84 per cent habitations which have a middle school within three kms. which means shortage of elementary sections in 16 per cent habitations. Similarly, there is also a shortage of secondary and senior secondary schools in 10 per cent and 20 per cent

habitations, according the distance norm of five kms. and eight kms. respectively (*Sixth All India Educational Survey, 1993-94*).

The assessment of the number of schools reveals that though the state is progressing well and there has been a quantitative expansion of educational institutions in Punjab, the real increase in the number of schools has been just at the primary level. However, according to the present data, following the norm that there should be one secondary section for every 1.8 elementary section, the shortage comes to nearly 6,000 secondary schools. This indicates that even if all the secondary schools are upgraded upto the senior secondary level, there will still be a shortage of nearly 3,000 schools.

Alternate Schooling

Non-formal education for children in the 6-14 age-group: In pursuance of the National Policy on Education, 1986, the Central Government provides help for the establishment of non-formal education centres. But in Punjab, neither the government, nor NGOs, nor voluntary agencies run any such centres. Non-formal education was carried on until 1991, but there are no data available. However, since 1991, Punjab has no facility for non-formal education at the primary or upper primary level for children in the age group 6-14. In only one district of Amritsar, a Chandigarh-based NGO applied to the Centre for starting NFE centres in 90 slums of the district. This project has been approved. But at present, no non-formal educational centre is operational. It is, however, proposed that under the Sarv Shiksha Abhiyan, in the Tenth Plan, the Education Guarantee Scheme and alternative innovative education will be initiated.

Open school programme for children in the 14-18 age-group: The National Policy 1986, had proposed alternative education/open schools at the secondary level to provide access to dropouts, working children and girls. However, the state's effort so far has been to bring the children to mainstream/ formal schooling, and hence not much work has been done on open schools, though the large number of school dropouts warrant such an initiative.

Punjab started the open school programme in 1992, as an integral part of Punjab School Education Board as a centre of open learning to cover the gap at the secondary level. PSEB is operating the programme with 175 centres and 16,000 students. It has not developed any separate set of operational procedures except providing flexibility in the number of chances for passing examinations. In 1994-95 the open school was converted into a correspondence course, as a distance education programme. It has the same curriculum, examination and certification process as in formal schools. Except for this programme at the matriculation level, there is no alternative schooling in the state at present for the out-of-school children in the 14-18 age group. The open school in Punjab is dependent only on student fees. In the absence of any financial support and requisite publicity, it has not realized its full potential. Recently, the state government claims to have formed VEDCs in the villages to check drop-out rates under SSA. However till date, Punjab Open School has hardly been able to cover even one per cent of the out-of-school children at the matriculation level. The open schools in fact have lost their orientation and become a haven for unrecognized schools which wish to expand up to the secondary level of education and get their pupils certified through these open schools. To restore the essential character of the open schools, steps have to be taken urgently to rescue these from the stranglehold of commercially-run private schools. Further, Central funding is required to subsidize the study material and offset publicity

costs. At present, the number of study centres is far short of the requirement. Central assistance is essential for the extension and upgradation of the study centre network. But the best way will be to utilize the existing school infrastructure (buildings and teachers) innovatively for such non-formal education.

Goal II: Universal Enrollment and Retention of Children up to the Age of 14 Years

Current Status

Table 13
Admission in Schools, 1984-1998 (in lakh)

Year	Class I	Class VI	Class IX	Class XI
1984	4.49	2.72	1.70	0.33
1998	4.80	3.64	2.78	1.08

Source: Directorate of Education, Punjab

Enrollment in primary classes in government and recognized schools has remained almost static for 15 years, i.e., the number of admissions has increased from 4.49 lakh to only 4.80 lakh during 1984 to 1998. The growth at upper primary, high and senior secondary levels seems to be quite healthy, but in reality the picture is not that rosy, as it is based on a smaller base.

Total enrollment of students in recognized institutions increased from 30.6 lakh in 1980-81 to 36.61 lakh in 1991. However, the increase in the next nine years was not that significant. It touched only 39.48 lakh in 2000. These figures reveal that massive expansion in enrollment took place in 1980-90. Enrollment among girls increased from 13.1 lakh in 1980 to 15.9 lakh in 1991 and reached 18.55 lakh in 1999-2000. Presently, it has marginally decreased to 18.47 lakh in 2000-2001, whereas the enrollment of boys increased from 17.4 lakh (1980) to 20.0 lakh (1990) and only to 21.01 lakh (2001). The increase in enrollment has been more in the case of girls (5.37 lakh) than boys (3.61 lakh) during 1980-2001 (Table 14).

Further, enrollment of Scheduled Caste students too has been rising in the age groups 6-11, 11-14 and 14-18. The increase was from 7.9 lakh in 1980 to 10.2 lakh in 1991 and has touched 14.31 lakh in 2000-01. The real expansion in enrollment of SCs is, however, a recent phenomenon. Their numbers grew the maximum in 1990-2000. However, the share of SCs at the primary level was 43.84 per cent of the total students in 2000-01, which came down to 32.89 per cent at the middle level and to 21.18 per cent at the secondary level. This has emerged as a very important intervention area for the government, as the data reveal a high dropout rate among Scheduled Castes as they move to higher levels of education.

Table 14
Enrollment of Scheduled Caste, Non-Scheduled Caste and Total Students in Recognized Institutions, 2000-2001 (In lakh)

Age-group	Total Students			Non-Scheduled Castes			Scheduled Castes		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
	1	2	3	4	5	6	7	8	9
6-11									
1980-81	11.4	9.3	20.7	7.9	6.7	14.6	3.5	2.6	6.1
1990-91	11.1	9.5	20.7	7.1	6.3	13.5	4.0	3.2	7.2
1999-2000	11.25	10.12	21.37	6.38	5.67	12.05	4.87	4.45	9.32
2000-01	11.20	9.92	21.12	6.32	5.54	11.86	4.88	4.38	9.26

11-14									
1980-81	4.3	2.7	7.0	3.4	2.3	5.6	0.9	0.4	1.4
1990-91	5.3	3.9	9.3	4.1	3.2	7.3	1.2	0.7	2.0
1999-2000	5.27	4.69	9.96	3.57	3.21	6.78	1.70	1.48	3.18
2000-01	5.22	4.69	9.91	3.49	3.16	6.65	1.73	1.53	3.26
14-18									
1980-81	1.8	1.1	2.9	1.5	1.0	2.5	0.3	0.1	0.4
1990-91	3.6	2.5	6.1	2.9	2.1	5.1	0.7	0.4	1.0
1999-2000	4.54	3.74	8.28	3.56	2.99	6.55	0.98	0.75	1.73
2000-01	4.59	3.86	8.45	3.60	3.06	6.66	0.99	0.80	1.79
Total									
1980-81	17.4	13.1	30.6	12.7	10.0	22.7	4.7	3.1	7.9
1990-91	20.0	15.9	36.1	13.3	11.6	25.9	6.7	4.3	10.2
1999-2000	21.06	18.55	39.61	13.51	11.87	25.38	7.55	6.68	14.23
2000-01	21.01	18.47	39.48	13.41	11.76	25.17	7.60	6.71	14.31

Source: Director Public Instruction, Schools, Punjab; cf *Economic Survey of Punjab, 2001*

It was also felt pertinent to study the age-specific enrollment ratios in the age group 6-14.

Table 15
Age-specific Enrollment Ratios in Select States, 1999

	6 to Below 11			11 to 14			6 to 14		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Punjab	74.99	72.91	74.01	72.18	65.82	69.19	73.96	70.31	72.24
Haryana	71.07	67.24	69.27	63.56	52.82	58.65	68.33	62.13	65.45
Himachal Pradesh	86.96	82.87	84.95	87.10	76.74	82.05	81.02	80.52	83.84
Kerala	84.74	82.12	83.44	94.98	93.67	94.33	88.75	86.63	87.70
Gujarat	81.39	70.56	76.14	90.63	72.92	82.23	84.75	71.40	78.33
Tamil Nadu	79.58	76.49	78.06	90.99	82.63	86.92	83.83	78.75	81.34
India	73.20	59.13	66.40	65.02	48.20	57.06	70.33	55.40	63.17

Source: *Sixth All India Education Survey, 1999*, Data pertains to 1993-94

The age-specific enrollment ratio is only 74.01 for children in the age group six to below 11 and 69.19 for the 11 to 14 age group. Further, only 55 per cent of the children in the 14-7 age group are enrolled in schools. The enrollment ratio is 74.99 for boys and 72.91 for girls in the six to 11 age group and 72.18 for boys and 65.82 for girls in the 11 to 14 age group. Although Punjab's figures are higher than the national enrollment figures (63.17), it is still behind many other states such as Kerala, Himachal Pradesh, Gujarat, Tamil Nadu, etc. In spite of the tall claims of the Punjab Government of achieving a state of high excellence in education, it is a matter of concern that 28 per cent of our children in the 6-14 age group are as yet either not enrolled or are in unrecognized schools.

From independence till the sixties, most children attended schools run by different state governments and the number of private schools was rather small. Recently there has been an expansion in the number of private schools.

Table 16
Percentage Distribution of Students (6-14 Age Group) in Government/ Government-aided and Private Schools in Select States, 1994

States	Government Schools/Govt.-aided Schools	Private Schools
Harayana	86.9	12.8
H.P.	95.0	4.8
Punjab	80.2	19.5
Bihar	90.6	8.6
U.P.	73.8	27.2
M.P.	96.1	3.8
Orrisa	95.7	4.1
Rajasthan	96.5	3.4
West Bengal	99.0	1.0
Gujrat	98.2	2.0
Maharashtra	98.3	1.5
Andhra Pradesh	89.7	10.2
Karnataka	90.2	9.6
Kerala	88.0	12.0
Tamil Nadu	93.0	7.0
All India	90.0	9.8

Source: India Human Development Report, 1999

On the whole, in rural India, about 90 per cent of all school-going children in 1994 attended government/government-aided schools. Other states, such as HP, Bihar, MP, Orissa, Rajasthan, Maharashtra, Karnataka and Tamil Nadu too had a very high percentage of children going to government/ government-aided schools. Even Kerala had 88 per cent of children in government/government-aided schools. However, Punjab is the topmost state after UP, with a relatively high proportion of students attending private schools.

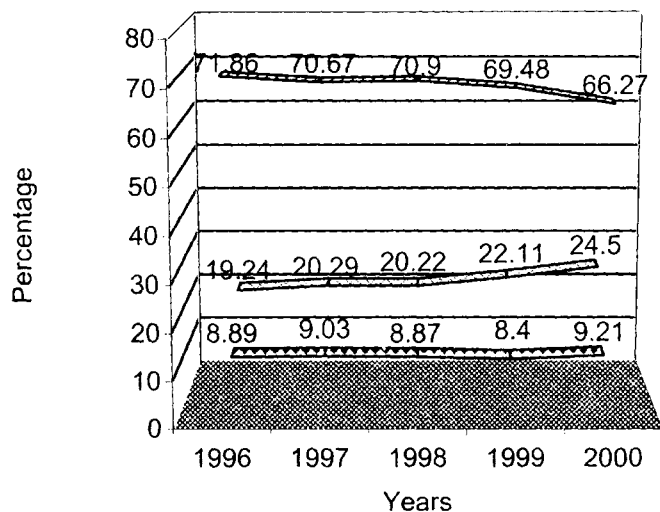
In the last decade or so, there has also been a rapid increase in the number of unrecognized private schools in Punjab at the primary level (figures under documentation). The enrollment of children in these unrecognized schools in Punjab has reached 25 per cent of total enrollment at the primary level, although the number of such unrecognized schools is negligible at the middle and high level. Taking into account the unrecognized schools, total enrollment in primary schools, increased 5.20 per cent during 1996-2000 which is obvious from the data in Table 17.

Table 17
Management-wise Enrollment at Primary Level, 1996-2000 (Per cent to Total)

Year	Govt. Schools	Recognised Schools	Un-recognised Schools
1996	71.86	8.89	19.24
1997	70.67	9.03	20.29
1998	70.90	8.87	20.22
1999	69.48	8.40	22.11
2000	66.27	9.21	24.50

Source: Directorate of Education, Punjab (1996-2000)

Figure 2
Management-wise Trends in Enrollment at Primary Schools Level :
Punjab



Govt. Schools
 Recognised Schools
 Unrecognised Schools

Source: Directorate of Education, Punjab (1996-2000)

The share of government schools in total enrollment in primary classes is gradually decreasing and has come down from 71.86 per cent in 1996 to 66.27 per cent in 2000. The share of recognized schools in total enrollment is marginally increasing and has gone up to 9.21 per cent from 8.89 per cent in 1996-2000. Larger growth is in the unrecognized schools, which has gained 24.50 per cent points (2000) from 19.24 per cent points (1996). It reflects the diminishing confidence of the public in government-run schools, which not only lack such basic infrastructure as buildings and furniture, but also motivation and commitment of the teachers. Hence households with comparatively higher income prefer to send their children to private schools, which they perceive as imparting qualitatively better education. However, without undermining their role in enrolling children in small mohallas, who might otherwise have been out of school, the government has recently started the policy of enlisting the unrecognized schools so that these are also brought under some kind of check and control, and also to enable the educational data of these schools to be included in the education statistics of the state.

Household expenditure: According to the Constitution of India, primary and elementary schooling have to be provided free of cost to all citizens. However, except for tuition fees, parents continue to bear the expenditure on other kinds of fees, books, stationery, uniforms, etc.

Table 18
Per Student Annual Household Expenditure on Elementary Education by Select States, 1992 and 1994

States	1992	1994
Harayana	801	696
H.P.	-	842
Punjab	612	670
Bihar	246	375
U.P.	-	351
M.P	281	258
Orisa	309	253
Rajasthan	364	428
West Bengal	504	316
Gujrat	342	278
Maharashtra	329	302
Andra pradesh	378	295
Karnataka	448	383
Kerala	754	586
Tamil Nadu	349	379
All India	4640	378

Source: *India Human Development Report, NCAER, 1999*

On an average, at the elementary level (including private schools), the household expenditure per child is annually Rs. 670 (1994) in Punjab. It has increased from Rs.612 in 1992. This is despite the fact that free elementary education has been declared as a fundamental right. Household expenditure is quite high when compared to the national level, where the per pupil expenditure is Rs.378. Household expenditure per child is Rs. 479 in government schools and Rs.1,398 in private schools in Punjab, as compared to Rs. 317 in government schools and Rs.742 per annum in private schools at the national level. Punjab ranks third (only after Haryana and Himachal Pradesh) so far as household expenditure on elementary education is concerned. It was reported that a major chunk of the household expenditure on education was also spent on private coaching/tuitions, apart from transport, uniform and books.

The state government also spends quite a large budget on school education. About 1,15,855 teachers and 19,554 support persons work in the department. There are three Directorates functioning under the aegis of education. There are four accepted levels of education – Primary, Middle, Secondary and Senior Secondary. Figures from NSSO 52nd round (1995-96) show that Punjab spends more than double the national average on school education. The average expenditure per child in general education by Punjab is Rs. 1,394 in rural areas as compared to only Rs. 570 in India. Again, in urban areas, Punjab spends Rs. 2,786 per child as compared to Rs. 1,686 at the all-India level. It is, therefore, high time that the state rationalizes its per student expenditure.

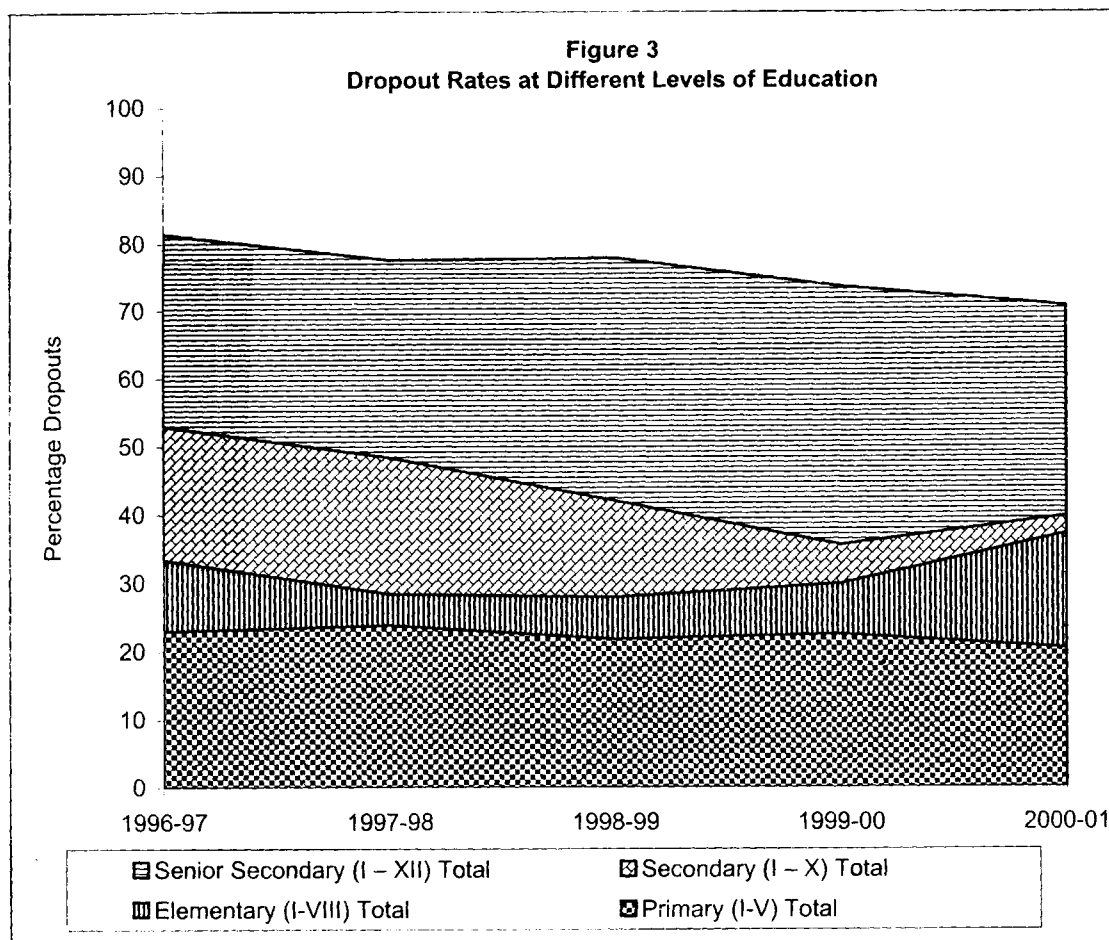
Retention in Schools

Household and state expenditure per child show that huge amounts are spent in educating every single child. Therefore, enrollment by itself is no panacea if children do not continue education beyond a few years. Dropout is in fact an indicator of wastage in education.

Table 19
Dropout Rate in Punjab, 1988-2000

Year	Primary (I-V)			Elementary (I-VIII)			Secondary (I-X)			Senior Secondary (I-XII)		
	Male	Fe-male	Total	Male	Fe-male	Total	Male	Fe-male	Total	Male	Fe-male	Total
1988-89	29.20	29.62	29.39				-	-	-	-	-	-
1991-92	29.83	30.25	30.02	33.12	41.29	36.90	-	-	-	-	-	-
1992-93	31.05	31.85	31.42	42.77	48.40	45.38	-	-	-	-	-	-
1993-94	20.69	22.94	21.74	36.15	72.78	39.23	44.88	52.81	48.54	-	-	-
1994-95	22.63	22.94	22.74	37.68	43.01	40.15	51.54	56.88	54.01	-	-	-
1995-96	22.83	22.61	22.73	38.16	43.58	40.66	51.03	54.29	52.54	79.58	83.27	81.28
1996-97	24.03	21.76	22.97	31.29	35.82	33.41	51.39	54.71	52.93	80.00	82.93	81.40
1997-98	25.21	22.28	23.84	26.56	30.50	28.40	46.89	50.10	48.37	76.28	79.28	77.60
1998-99	22.86	20.62	21.79	26.75	29.28	27.92	39.99	44.35	42.03	76.43	79.47	77.84
1999-00	24.83	20.15	22.49	29.82	29.90	29.86	35.37	35.73	35.54	-	-	-
2000-01	21.96	18.53	20.36	36.86	37.42	37.13	40.39	38.84	39.67	-	-	-

Source: Directorate of Secondary Education, Punjab



Source: Directorate of Secondary Education, Punjab

The dropout rate at the primary level of education in Punjab declined from 31.42 per cent in 1992-93 to 21.74 per cent in 1993-94 but thereafter it increased marginally and has again declined to 20.36 per cent at present, which is less than the dropout at the National level (42.39%, 1998-99). Surprisingly, the dropout rate for boys (21.96%) is more than that of girls (18.53%) at the primary level. Although at the elementary level

the drop-out is less in Punjab than at the all India level (56.82% in 1998), it continues to be at 37 per cent, as it was in 1991-92. The male and the female dropout rates are almost similar at the elementary level. At the secondary level, the dropout rate increased from 48.54 per cent in 1993-94 to 54.01 per cent in 1994-95, but thereafter it consistently declined till 1999 and reached 35.54%, but recently it has again risen to 40 per cent (2000-01).

In spite of the government's initiative to reduce the dropout rate, the figures continue to be very alarming. It is a matter of great concern that 20 per cent of the children drop out of schools at the primary level, 37 per cent by the time they reach the middle level, 40 per cent at the secondary and 78 per cent at the 10+2 level, i.e., 78 per cent of the children in class I dropout by the time they reach senior secondary classes. It is a matter of serious concern that out of the total students enrolled in class I only 22 per cent reach class XII.

Out-of-school children: According to the survey conducted by the Directorate of Education, there are 1.69 lakh children in the 6-11 age group and 1.28 lakh children in the 11-14 age group in the state, who do not attend school. According to the data available, 2.97 lakh children in the 6-14 age group and 10.52 lakh children in the 14-8 age group are out of the school network.

Table 20
Out-of-school Children, 2001

Age-group	Male	Female	Total
6-11	89276	79701	168977
11-14	67072	61400	128472
6-14*	156348	141101	297449
14-17**	540126	512504	1052630

Source: Directorate of Education, Punjab

Note: * Based on village survey

** Based on projected population and enrollment

It may be observed that 76.91 per cent of the out-of-school children belong to the SC or OBC population. Even the remaining 23.09 per cent, though may be coming from upper social classes but belong to the economically weaker sections.

Further, the Directorate of Education also confirms that out of the 2.97 lakh children not going to schools, 1.13 lakh (37.91%) are engaged in one or other kind of labour activity and the majority of them are in the age group 11-14 years.

Besides working as labourers or assisting their parents in work, the other reasons for children remaining out of school/or dropping out of school, identified by the Directorate of Education are: 1) poverty, 2) large family, 3) lack of inspiration/ interest/awareness or disinterest among parents and children, 4) illness/death/desertion/ emigration of either of parents, 5) lack of teachers/ infrastructure in schools, 6) study curriculum uninspiring/ dull/difficult, 7) teachers uninterested/uninspiring/dull/rude, 8) timing not convenient and 9) access to school/difficult/far away, etc. In addition to the reasons mentioned above, field studies also suggest that many parents still hesitate to send girls to co-educational institutions and are particularly averse to those in which there are no women teachers. In Punjab there are 48 per cent such schools. Thus, state intervention becomes important in not just providing sound education, economic incentives and committed teachers, but also in tackling the socio-cultural impediments.

Further, it is not only important to initiate schemes but also to ensure its regular monitoring, e.g., the scheme for providing scholarships for attendance to the SC girls is being promoted as an economic incentive, but field visits to different schools in various districts in Punjab revealed that money for disbursement under this scheme is not remitted regularly. Scholarships are not paid in time, if paid at all, was the common complaint of the school authorities. Many a time, the scholarships were received after the students had passed out of the Institution.

Goal III: Improving Quality of School Education
(In terms of strengthening curriculum, teaching practices, evaluation methods, teacher-pupil ratio, options and infrastructural facilities)

Current Status

Heavy obsolete syllabus, outmoded teaching methods and inappropriate examination system: Overall improvement in curriculum, teaching practices and examination methods were the core targets for secondary education, envisaged even in the year 1986 as mentioned in the National Policy of Education. However, at present, the quality of school education and the creativity of students are being adversely affected by the heavy syllabus prescribed and the system of examination and awarding marks in the schools. Although, Punjab Government claims that it is striving to make the curriculum more relevant to local specificities, many studies, including the one conducted by CRRID in Faridkot and Lambi Blocks in Punjab, reveal that the parents are not satisfied with the syllabus taught, as they feel that it does not give their children access to skills that are related to the employment available outside. Empirical studies reveal that people felt that what their children learnt in schools were not relevant for everyday life. It was also suggested by the teachers of different schools that the curriculum framework should be based on both compulsory and flexible subjects. Except languages, arithmetic and general science, all other subjects, such as algebra, geometry, geography and even history were not of practical value in day to day life and hence could be listed as optional subjects. It is important to make the curriculum more relevant and flexible.

It is also strongly felt that present methods of teaching are quite outmoded especially in the rural areas. The percentage of rural enrollment to total enrollment is as high as 75 per cent at the primary level and 70 per cent at the middle level. Quite often, the teachers encourage memorizing the contents of books and rote learning. There is also very little stress on value-education in the curriculum. Teachers and curriculum have been reported as uninspiring. This has been a major reason for school dropouts. The level of satisfaction of children/parents can be imagined from the fact that out of 100 students enrolled in class I in Punjab, only 60 per cent reached class 10 and 22 per cent reached class 12.

Further, urban-rural disparities emerge because of the privately managed English-medium institutions, generally located in urban areas. Although Punjab Government has decided to introduce English language in all government schools in the class 3 itself (according to the latest Education Policy, 2002), it, however, seems that this will create more problems than solve them.

One notices that nearly 98 per cent expenditure at the primary level and 90 per cent at the secondary level are incurred on salaries of teachers and administration, leaving very little for socially useful work programmes, excursions, games and hobbies, science equipment and kits or even simple blackboards, chalks, posters and charts. In these circumstances, even an inspired teacher, with the best of training would have no choice but to encourage rote-learning of texts.

The present mode of teaching/learning is a matter of concern when one considers that in Punjab only 75 per cent of the school-age children ever go to recognized primary schools and only 58 per cent appear for the 10th standard public examination. The pass percentage in the matriculation examination is only 49 per cent for regular students and 33 per cent for those appearing privately. Pass percentages have deteriorated over the years both among regular as well as private students.

Table 21
Pass Percentage in Matriculation Examination, 1998-2001

Year	Regular	Passed	%age	Private	Passed	%age
1998	284456	187613	65.95	58545	24430	41.72
1999	274275	134858	49.16	76665	31828	41.51
2000	307949	161824	52.54	84999	33972	39.96
2001	272465	133996	49.17	100968	33854	33.52

Source: Punjab State Education Board, Mohali

Note: * Data pertains to Punjab School Education Boards only

Low examination results at grade 10 clearly indicate the weakness in the knowledge and understanding of the subjects among the students. It is a direct indicator of the low quality of teaching in schools. Otherwise how could one explain nearly 50 per cent failure rate in Board Examinations at the matriculation level?. Since the parents and the state have invested such huge amounts for a period of 10 to 12 years in the education of children, is not this an expression of the failure of the entire education system?

It is, therefore, suggested that while classroom learning is important, what the child learns by self-observation outside the classroom is equally important. The child must become an active participant in the process of learning through observation, field studies, experiments and discussions. The child's individuality and creativity needs to be given due importance. Innovations in curriculum, which should be based on the needs of the learners and related to the local environment, are required. It has been strongly recommended by educationists that there should be no textbooks upto the fifth class and the curriculum should be totally activity-based. Priority also needs to be given to reorientation in the outlook of the teachers, which at present is getting highly commercialized, as reflected in the number of tuitions being encouraged by them. There is also need for overhauling the examination system, so that it recognizes and evaluates creativity and new thinking rather than mere memorization. Schools must change from mere education shops to centres for imparting knowledge and building skill levels.

Teachers will perhaps have to play the most important role to enable the coming generations to develop capabilities to cope with a profoundly change-oriented world. But for this, teachers, education/training will have to be adopted as the first area of intervention.

Teacher-pupil ratio: The teacher-pupil ratio is also an important indicator of the quality of school education.

Table 22
District-wise (Stage-wise) Teacher-Pupil Ratio, 2001

Year/District	Class			
	I to V	VI to VIII	IX and X	XI to XII
1971	42	30	18	-
1980	41	25	17	-
1990	38	20	29	-
1997	40	29	22	24
1998	42	28	22	21
1999	41	26	23	26
2000	42	26	23	28
District, 2000				
Gurdaspur	32	27	21	26
Amritsar	40	24	32	24
Kapurthala	36	23	20	30
Jalandhar	45	28	28	24
Nawanshehar	47	31	22	19
Hoshiarpur	35	28	25	29
Rupnagar	36	23	21	14
Ludhiana	40	25	21	26
Ferozepur	49	27	22	28
Faridkot	47	23	13	20
Muktsar	55	24	22	28
Moga	54	32	23	17
Bathinda	51	28	19	15
Mansa	60	31	22	43
Sangrur	50	28	20	20
Patiala	41	26	21	23
Fatehgarh Sahib	45	29	22	13

Source: DPI, Punjab; cf *Statistical Abstract of Punjab, 2001*

In Punjab, the teacher-pupil ratio is 1:42 at the primary level, 1:26 at the middle level, 1:23 at the secondary and 1:28 at the higher secondary level (2000). However, notwithstanding this overall satisfactory position, there are significant inter-district disparities, especially in primary schools. In some districts, such as Muktsar, Mansa, Moga and Sangrur, the teacher-pupil ratio is more than 1:50 at the primary level.

Table 23
Classification of State Primary Schools on the Basis of Sanctioned Posts of Teachers/Head Teachers/Centre Head Teachers, 2002

District	No Teacher	One Teacher	Two Teacher	Three Teacher	Four Teacher	Five Teacher	Six Teacher	Seven Teacher	Eight or More Teacher
Amritsar	52	1	328	268	233	213	114	64	141
Bhatinda	33	1	59	59	69	47	39	17	66
Faridkot	32	10	51	42	26	32	18	16	33
Fatehgarh Sahib	5	0	237	114	52	36	7	1	4
Ferozepur	95	11	612	205	94	64	35	21	23
Gurdaspur	94	69	619	359	210	113	52	22	24
Hoshiarpur	42	10	460	349	227	138	30	16	24
Jalandhar	42	10	267	210	156	167	59	29	57
Kapurthala	52	2	237	106	63	73	13	3	11
Lothian	39	2	152	191	179	222	74	56	99
Mansa	11	1	55	62	57	38	17	18	27
Moga	30	2	85	36	28	57	29	18	87
Muktsar	25	4	39	56	50	61	36	16	33
Nawanshehar	12	6	151	132	75	48	9	3	6
Patiala	86	85	418	252	156	91	45	24	28
Ropar	21	13	481	170	99	54	17	10	10
Sangrur	75	15	223	185	140	103	54	26	51
Total	746 (5.5)	242 (1.8)	4474 (33.2)	2796 (20.8)	1914 (14.2)	1557 (11.6)	648 (4.8)	360 (2.7)	724 (5.4)

Source: Tentative figures derived from the Directorate of Education, 2002

Note: Data pertains to total functional schools (13461) including branch schools recently regularized under SSA

Surprisingly, at the primary level in Punjab there are 242 (2%) schools, which have only one sanctioned post for a teacher. Shockingly, there are 746 schools (6%) where there is no sanctioned post of a teacher/head teacher/or a centre head teacher and this is especially true in Gurdaspur, Sangrur, Ferozepur and Patiala districts. The rationale behind some schools not being sanctioned a single post of a teacher and the others being sanctioned eight posts to teach five classes is not known. Frequent transfers of teachers is another area of concern.

Further, field visits in the blocks of Punjab have shown that, in rural areas, even where there are teachers, there is the persistent problem of absenteeism. This becomes even more serious in single-teacher schools. Panchayats could, therefore, be given the role of monitoring absenteeism among teachers. During field visits, it was also observed that teaching by proxy teachers existed in areas off the main roads.

Lack of options: The major challenge of education to achieve the ends of equity, documented in the policy perspective, is to ensure the availability of facilities for studying science and vocational subjects in all secondary schools so that everyone would be able to exercise equal freedom of choice with regard to the professions that they would like to pursue in future. In Punjab, the actual choice of subjects starts at the higher secondary level and the status is revealed in Table 24.

Table 24
Breakup of Senior-Secondary Schools (State Govt), 1999

Year	Arts	Science	Commerce	Vocational
1999	847 (100)	408 (47.1)	311 (36.7)	262 (30.9)

Source: Education Department, Punjab

The data reveal that Arts courses are available in all senior secondary schools. However, the option of choosing other courses as science, commerce, vocational, etc., is available only in a limited number of schools. In fact only 47 per cent of the schools have the option of science, 37 per cent commerce and 31 per cent vocational education.

Table 25
Enrollment according to the Type of Courses at 10+2 Stage, 1993-94

	Arts		Science		Commerce		Agriculture		Vocational/ Technical		Others		Total	
	T	G	T	G	T	G	T	G	T	G	T	G	T	G
Rural														
XI & XII	32862 (79.8)	10975 (81.9)	2527 (6.1)	942 (7.0)	1212 (2.9)	337 (2.5)	246 (0.6)	73 (0.5)	2852 (6.9)	705 (5.3)	1465 (3.6)	359 (2.6)	41164	13391
Urban														
XI & XII	59524 (66.0)	28723 (70.4)	13692 (15.2)	6068 (14.9)	7435 (8.3)	2704 (6.6)	127 (0.1)	54 (0.1)	5583 (6.2)	2093 (5.1)	3747 (4.2)	1180 (2.9)	90108	40822
Total														
XI & XII	92386 (70.4)	39698 (73.20)	16219 (12.4)	7010 (12.9)	8647 (6.6)	3041 (5.6)	373 (0.3)	127 (0.2)	8435 (6.4)	2798 (5.2)	5212 (3.9)	1539 (2.8)	131272	54213

Source: Sixth All India Education Survey, 1999, Data pertains to 1993-94

At the 10+2 level, a large majority of the students (70%) opt for Arts and only a very small proportion (12%) opt for science, seven per cent for commerce and six per cent for vocational courses. There are significant urban-rural differences emerging in the choice of subjects; 80 per cent of students in rural areas opt for arts subjects as compared to 66 per cent in urban areas. The percentage of children opting for science and commerce is comparatively more in urban than in rural areas. Vocationalization of higher secondary education was the major objective of the reforms envisaged in the Education Policy. It however seems that attempts made so far have not borne fruit and enrollment in the vocational stream, which was expected to reach 50 per cent at the 10+2 level, has remained rather marginal as only six per cent have opted for it in both rural and urban areas.

Table 26
Distribution of Enrollment at Senior Secondary Stage in Select States by Course of Study, 1993-94

State	Arts	Science	Commerce	Agriculture	Vocational	Others	Total
Karnataka	64.80	16.50	14.80	0.30	2.50	1.00	100
Kerala	13.40	31.80	5.50	5.80	41.50	2.00	100
Madhya Pradesh	31.80	46.70	12.30	4.60	2.60	2.10	100
Maharashtra	52.80	19.00	23.30	0.20	4.10	0.60	100
Manipur	46.40	36.70	5.70	0.00	1.60	9.60	100
Meghalaya	38.00	56.20	3.50	0.00	2.30	0.00	100
Andhra Pradesh	28.40	44.00	24.10	0.20	2.80	0.40	100
Punjab	70.40	12.40	6.60	0.30	6.40	4.00	100

Source: Sixth All India Educational Survey, 1999, Data pertains to 1993-94

Further, in Punjab only 12 per cent of the students opt for science as compared to 32 per cent in Kerala, 47 per cent in Madhya Pradesh, 56 per cent in Meghalaya and 44 per cent in Andhra Pradesh. Similarly, children opting for commerce are less in Punjab than in other states. The state is also far behind Kerala in vocational education. The main reason for it is the outdated syllabus, with no relevance to the technical requirements in the employment market. Hence this stream is less popular as it fails to prepare the child for work and for upward mobility. The committed expenditure on teachers with knowledge limited only to a particular outdated field, already in employment with no

students opting for it is a burden on the state. As pointed out by the government itself 'many experienced teachers have stated that vocationalization within the secondary school system has been a casualty at the hands of educational planners who have no insight into the opportunities of employment, or the type of expertise required, for vocational employment. Consequently, lack of professionalism characterizes every initiative in the planning of training of teachers, preparation of curricula, selection of courses, infrastructure and other prerequisites. For future planning, therefore, while laying stress on vocationalization of education, adequate financial resources have to be allocated for starting viable activities in this field. Adequate infrastructure and manpower prerequisites have also to be sorted out.

The total non-enrollment of the children at the secondary level (45%), their dropout rate (48% at the secondary and 78% at the higher secondary level), their results (50% failure at the matriculation level), all show that the secondary and senior secondary levels have remained a terminal stage for the child to stop education. Perhaps this is considered as the time for the child to start working. Actually, secondary education was never considered a goal and this was perhaps the major drawback of education planners. It is only now that the state is moving towards secondary education and is preparing itself for universal secondary and senior secondary education by the year 2015 (*World Bank Report prepared by Department of Education, 2002*).

Lack of infrastructural facilities in schools: For the child, the school is one of the main agencies of socialization, and the first prerequisite of schooling is availability of good quality infrastructure for imparting education. Hence a school must be attractive in terms of its environment. However, the data in the tables that follow do not give a very positive picture of the infrastructure facilities available in the schools of Punjab.

Table 27
**Count of Facilities Required in Primary/Middle/Secondary/
Senior Secondary Schools, 1999**

Level of School	Buildings	Toilets	Boundary Walls	Verandas	Playgrounds	Total Schools (Number)
Primary	676 (4.9)	10770 (78.2)	4995 (36.3)	3780 (27.5)	6147 (44.6)	13769
Middle	303 (13.0)	1552 (66.4)	1120 (47.9)	1107 (47.4)	1140 (48.8)	2336
High	138 (8.0)	640 (37.0)	480 (27.8)	545 (31.5)	508 (29.4)	1728
Senior Secondary	36 (4.3)	217 (26.2)	166 (20.0)	186 (22.4)	181 (21.8)	829

Source: Education Department, 1999

Note: Total schools also include the functional schools based on school level survey

The data in Tables 27 and 28 reveal that there are 676 schools (5%), at the primary level without their own buildings; 78 per cent require more toilets, 36 per cent boundary walls, 28 per cent verandas and 45 per cent require usable playgrounds. Further, there are only 76 per cent school buildings in good condition.

The remaining one-fourth of the buildings require urgent repair. Drinking water, which is a basic necessity, is also not available in 20 per cent of the schools. Further, only 31 per cent of the Government Primary Schools have the facility of toilets for girls and boys. At

the middle level, 13 per cent of the schools require buildings, 48 per cent boundary walls, 47 per cent verandas, 49 per cent playgrounds and 66 per cent require toilet facilities.

Although provision of such infrastructural facilities, as buildings, playgrounds, etc., at the secondary level were the priority areas to be met during the Seventh Plan itself, there are still eight per cent of secondary schools which require buildings of their own, 37 per cent require toilets, 32 per cent verandas and 29 per cent playgrounds. Similarly, at the senior secondary level, five per cent of the schools are without buildings and 26 per cent require toilets. Even at the 10+2 level where the children are grown-up and need to have privacy, there are no separate toilets for girls in a number of schools.

Table 28
Infrastructure Status Report of Government Primary School Including Branch Schools, 1998

District	School buildings in good condition	School buildings needing repair	Drinking water	Toilets for boys/girls available	Toilets for girls available	Total number of schools
Amritsar	834 (59.6)	565 (40.4)	1060 (75.8)	270 (9.3)	70 (5.0)	1399
Bathinda	373 (97.4)	10 (2.6)	320 (83.6)	187 (48.8)	37 (9.7)	383
Faridkot	195 (77.4)	57 (22.6)	197 (78.2)	111 (44.0)	41 (16.3)	252
Fatehgarh Sahib	349 (77.6)	100 (22.2)	377 (83.8)	118 (26.2)	49 (10.9)	450
Firozpur	1061 (84.8)	189 (15.1)	1015 (81.2)	395 (31.6)	166 (13.3)	1250
Gurdaspur	853 (55.1)	702 (45.3)	1001 (64.7)	262 (16.9)	138 (8.9)	1548
Hoshiarpur	1066 (83.0)	209 (16.3)	1090 (84.9)	266 (20.7)	93 (7.2)	1283
Jalandhar	774 (80.4)	195 (20.2)	883 (91.7)	371 (38.5)	167 (17.3)	963
Kapurthala	410 (76.5)	128 (23.9)	460 (85.8)	162 (30.2)	53 (6.5)	536
Ludhiana	871 (90.1)	126 (13.1)	917 (95.0)	528 (54.7)	273 (28.3)	965
Mansa	197 (70.6)	82 (29.4)	203 (72.8)	80 (28.7)	53 (18.9)	279
Moga	426	29 (6.4)	218 (47.9)	210 (46.2)	221 (48.6)	455
Muktsar	235 (75.1)	78 (24.9)	227 (72.5)	115 (36.7)	71 (22.6)	313
Nawan Shehar	332 (75.2)	108 (24.5)	384 (87.1)	130 (29.5)	38 (8.6)	441
Patiala	929 (80.7)	222 (19.3)	892 (77.5)	381 (33.1)	146 (12.7)	1151
Rupnagar	730 (80.8)	136 (15.0)	760 (84.1)	250 (27.6)	117 (12.9)	904
Sangrur	598 (70.5)	250 (29.5)	689 (81.3)	295 (34.8)	123 (14.5)	848
Total	10233 (76.3)	3186 (23.7)	10693 (79.7)	4131 (30.8)	1886 (14.1)	13420

Source: Education Department, 1998

Further information and data collected from the Directorate of Education too indicate that many of these buildings are in depilated conditions and have been declared unsafe for use as classrooms. The majority of the schools also face problems of shortage of

classrooms. The data reveal that 60 per cent of the primary schools and 58 per cent of the upper primary schools require additional classrooms. Further, 69 per cent of the secondary and 73 per cent of the higher secondary schools too are short of classrooms, although a programme for the construction of additional classrooms, to the extent they were deficient, was declared a major target in the National Policy 1986. The total number of additional classrooms required is 18,002 at the primary level, 4,150 at the upper primary, 4,091 at the secondary and 3,239 at the higher secondary level. There is also shortage of such basic necessities in the schools as blackboards, chalks and dusters. Nearly one-fourth of the sections do not have furniture even for the teachers. In 14 per cent of sections in the schools, the furniture/mats supplied for students are inadequate and in one-fourth there is absolutely no furniture, i.e., desk, bench, patre or even a mat for students. The data speak volumes about the state of infrastructure available in the schools.

In a nutshell, the condition of school buildings, basic amenities, availability of blackboard, furniture and playgrounds reveal that infrastructural facilities available at present in the schools of Punjab are poor. It is high time that our focus shifts to providing/upgrading/ optimally utilizing the existing infrastructural facilities in the schools.

A look at the current status of education in Punjab in terms of the national goals reveals that, in spite of a specific provision in the Constitution to endeavour to provide free and compulsory education up to the age of 14 and several explicit commitments with regard to the achievement of universal elementary education and improving secondary education, the progress so far has been way behind the target. In spite of the Policies on Education at the National Level and Programme of Action, the status of education in Punjab is not very impressive. In many cases, measures of reform could not be initiated because of lack of commitment, a positive attitude, planning and implementation.

Further there were faults at the stage of policy planning itself. The policy framework lacked the specificity required for evolving implementation strategies for a vast variety of situations existing on the ground. Hence, the commitment, which was to be fulfilled by the seventies/eighties, is still to be realized. There has been an uneven development of education not only between states but also between different castes and gender. Present schemes have not yielded significant results. A great many people, particularly educationists, feel that a large majority of the goals of the 1968 National Policy on Education still remain merely goals, even after the formulation of the 1986 and 1992 National Policy on Education.

Future Scenario

There are serious difficulties in presenting a comprehensive projection of the future because of inadequacy of data and lack of clarity about the overall future scenario. However, it would be adequate to present a broad picture, which might yield some insights into policy planning. Although it was projected that enrollment would slightly decline in the initial years, i.e., till the year 2001, but if the governments started to take action and seriously implemented their plans and policies, 'there will be acceleration of the programmes for the universalization of elementary education, which will increase the enrollment rate by 2006-07'. The likely scenario of the enrollment as projected by the Directorate of Education is given in Table 29.

Table 29
Projected Population and Accelerated Enrollment of 6-17 Age-group in
Government Schools, 1991-2011 (in thousand)

Year	Projected population 6-17 age	Projected accelerated enrollment 6-17 age
1991	53.99	30.14
1996	60.46	29.78
2001	62.07	29.97
2006	60.63	35.27
2011	56.94	34.36

Source: Project submitted by the Education Department to the World Bank, 2002

'With increase in access to upper primary and secondary schools, improvement of facilities at the school level, trained teachers, community participation and the achievement of the other objectives of the SSA, there will be an increase in the enrollment and retention rates. Increase at the primary level will be only just more than marginal, but at the upper primary and secondary levels, it will be substantial. Increased incentives will further attract the children to government schools' (Proposal submitted to the World Bank by the Department of Education, 2002). In spite of the increasing craze for private schools in Punjab, if the government improves the quality of school education according to the recommendations made in the pages that follow, i.e., making education useful and relevant for children through curriculum revision, child-centred teaching-learning methods, improvements in educational provisions, value-education, teachers' training, teacher empowerment, change in the examination system and improving the infrastructural facilities, enrollment in government schools will be at least 70 per cent of school-age going children by the year 2007. 'The enrollment in only government schools is likely to increase from the present 30.19 lakh (2001) to 35 lakh in 2006 or 2007. The increased enrollment and retention at all levels will also increase the output of more secondary graduates. The share of private schools in total enrollment is not likely to reach more than 30 per cent from the present 25 per cent' (Proposal submitted to the World Bank by the Department of Education, 2002). However, the government has to depart from 'tokenistic' planning on models provided by the national planners and others and take initiatives involving experimentation with specific objectives at the grassroot, institutional and district levels. It is also necessary to develop an authentic system of monitoring, appraisal and evaluation to achieve our present targets and also to cater to the projected education scenario of the future.

On-going Education Programmes/Schemes

Access	Enrollment and Retention	Quality Improvement
<p>Opening and upgradation of schools : Government has made efforts during the session 2001-02, and 1,404 schools have been upgraded, i.e., 468 from primary to middle level, 468 from middle to high and 468 from high to 10+2 level. The state government also plans to upgrade 200 more schools to middle, high and 10+2 level and open 50 new primary schools. Thus opening of new schools and upgradation of existing schools is being encouraged to achieve the goal of universal access to education.</p> <p>Total literacy campaigns and post literacy campaigns are in operation.</p> <p>A new Centrally sponsored scheme in the ratio 75:25 between the Government of India and the state has been introduced in 2001-02. Under this scheme, Alternative schooling is proposed to be provided for children in the 6-14 years age-group who were out of school. For this, 10,000 EGS centres are proposed to be set up.</p>	<p>Free and compulsory primary education.</p> <p>Attendance scholarship to SC girls.</p> <p>Mid-day Meal Scheme has been continuing in all districts since 1995. Three kg. wheat or two kg. rice is given for a period of 10 months per child.</p> <p>Free text-books to all the SC student and also to all girl children upto elementary level have been provided under SSA.</p> <p>Introduction of English from class-III.</p> <p>Appointment of para-teachers/siksha karmi.</p> <p>At present the state is hopeful of achieving universalization of elementary education within a decade through the Sarv Shiksha Abhiyan (SSA). SSA is a Centrally-sponsored scheme on a sharing basis between the GOI and the state government, with an objective to provide quality elementary education to all children and achieve Universalization of Elementary Education (UEE). The annual work plan for 2001-02 has been sanctioned Rs. 130 crores. The allocation on schemes is likely to increase in the coming years. The major thrusts in SSA are as follows:</p> <p>All 6-14 age group children in school by 2003.</p> <p>All 6-14 age group children complete five years of primary schooling by 2007.</p> <p>All 6-14 age group children complete eight years of schooling by 2010.</p> <p>Focus on elementary education of satisfactory quality with emphasis on education for life.</p> <p>Bridge all gender and social category gaps at primary stage by 2007 and at elementary education level by 2010.</p> <p>Universal retention by 2010.</p> <p>It has a holistic and convergent cafeteria approach, i.e., all the existing Centrally sponsored programmes of EE like Operation Black Board, Teacher Education, Non-formal education, Programme for Nutritional Support, Integrated Education for disabled children, Shiksha Karmi scheme and free education for girls, etc., have to be incorporated under this new framework of SSA. In addition to this, efforts and programmes of all the related departments have also to be dovetailed.</p>	<p>The scheme of Operation Black Board to improve school facilities by providing for more teachers, rooms and teaching/learning equipment. (Presently being clubbed with SSA)</p> <p>In-service training to JBT Teachers in DIETS: The scheme of strengthening teacher's education by establishing quality teacher training institutions, like District Institution of Education and Training (DIETS). 17 DIETS are functional.</p> <p>Strengthening and Improving Science Education in Schools :</p> <p>Pre-service and in-service training of teachers by SCERT (State Council of Education, Research and Training)</p>

Achievements In Literacy and School Education

- The literacy rate has increased from 58.51 per cent in 1991 to 69.95 per cent in 2001, a rise of 11.44 per cent points during the last 10 years.
- The gender gap in literacy rate has decreased from 15.25 per cent points in 1991 to 12.08 per cent points in 2001. Female literacy has increased 13.14 per cent points as compared to only 9.97 per cent points in the case of males in the last decade.
- The rural-urban gap in literacy rate has come down from 19.31 per cent points in 1991 to 13.97 per cent points in 2001.
- There has been a quantitative expansion of educational institutions, with the total number of schools increasing from 9,394 in 1970 to 16,038 in 1980 and further to 18,998 in 2000-2001. Data suggest that the most massive expansion of schools has taken place at the primary level. At present, except for some remote areas, all villages have access to primary schools.
- Enrollment of students in recognized institutions has gone up from 30.6 lakh in 1980-81 to 36.61 lakh in 1991 and the figure touched 39.48 lakh in 2000. Enrollment of girls has shown considerable improvement
- Enrollment of SC students has consistently been increasing. Their numbers increased from 7.9 lakh in 1980 to 10.2 lakh in 1991 and 14.31 lakh in 2000-2001.

AREAS OF CONCERN IN LITERACY AND SCHOOL EDUCATION

- Allocation of resources in education is only 2.88 per cent as against the target of six per cent of the SGDP.
- At present 99 per cent of the expenditure on education at the primary level and 90 per cent at the secondary level is being spent on salaries, leaving very little for development in other spheres of education.
- Punjab's rank in literacy rate has come down from the 12th position in 1971 to the 16th position in 2001. There are still 95 lakh illiterates in the state (2001 Census)
- Except for few districts, the TLC programme has not functioned well in Punjab.
- The literacy rate of the Scheduled Caste population is very low, i.e., 41.09 per cent. Female literacy rate of Scheduled Caste women (31.03%) is almost half that of non-Scheduled Caste women (57.6%). The literacy rate of SC women is as low as 12 per cent in Bathinda, 16 per cent in Faridkot, 15 per cent in Ferozepur and 17 per cent in Sangrur. Government should, therefore, give priority consideration to female Scheduled Caste in this pocket in Punjab.
- According to the 1991 Census, nearly one-fourth of the population had studied in the primary level or below, nine per cent upto middle level and 10 per cent upto matriculation level. Only three per cent of the population had studied upto graduation or above.
- Sixty-one per cent of the villages do not have an elementary section. 16 per cent habitations do not have access to a middle school even within the norm of three km. If we have to achieve our aim of universalizing elementary education, 100 per cent accessibility to elementary schools will have to be provided. Further, there is also shortage of secondary and senior secondary schools within the normative distance.
- One-fourth of the children in the 6-11 age group and more than 31 per cent in 11-14 age group are still not enrolled, or are enrolled in unrecognized schools.

- Share of government schools in total enrollment in primary classes is gradually decreasing and has come down from 71.86 per cent (1996) to 66 per cent (2000), whereas there has been a larger growth in the share of unrecognized private schools, which has now increased from 19 per cent to 25 per cent in the last four years. It reflects the discontent of the public with government run schools.
- Although Punjab has reduced the dropout figures to some extent, this rate is still very alarming, as 20 per cent of the children dropout at the primary level, 37 per cent at the middle level, 40 per cent at the secondary level and 78 per cent at the 10+2 level. It is a shocking fact that out of 100 children enrolled in class I, only 22 reach senior secondary level.
- The percentage of Scheduled Caste enrollment at the primary level is 43.84 per cent of the total students. It has come down to 32.89 per cent at the middle level and to 21.18 per cent at the secondary level. This reflects a very high dropout rate among Scheduled Castes, as they move to higher levels of education.
- The number of out-of-school children is also quite high. At present 2.97 lakh children in 6-14 age group and 10.52 lakh children in 14-18 age group are out of school.
- There is no non-formal education centre at present for children in the age group 6-14 and no alternative schooling in the state for out-of-school children in the age group 14-18 years, except for one at the matric level. That is why in Punjab open school has hardly been able to cover one per cent of the out-of-school children.
- There are significant inter-district disparities in teacher- pupil ratio. In some districts, such as Muktsar, Mansa and Moga, the teacher-pupil ratio at the primary level is more than 50 students per teacher as compared to other districts where the ratio varies between 31 to 40. Further there are many schools in Punjab where there is no, or only one sanctioned post of a teacher, head teacher or centre head teacher.
- The quality of teaching in schools can be judged by the poor results of the students. At present there is 50 per cent failure of students at the matriculation level.
- There are lack of infrastructural facilities and civic amenities in the schools.
- The heavy syllabus prescribed and the system and examination of awarding marks in most of the school are adversely affecting the quality of school education and the creativity of students. Schools with no, or a single post sanctioned for a teacher and problem of teachers' absenteeism are other threats to quality of school teaching.
- Five per cent buildings are required at the primary level, 13 per cent at the middle, eight per cent at the high and five per cent at the senior secondary level. Besides the building-less schools, there are many other schools where buildings, need urgent repair. Many of these buildings are in dilapidated conditions and have been declared unsafe for use as classrooms. The majority of the schools are also facing the problem of shortage of classrooms, toilets, playgrounds, boundary walls, verandas etc.

RECOMMENDATIONS (LITERACY AND SCHOOL EDUCATION)

To achieve the targets of elementary and secondary education, we need to take the following steps:

- 1. Optimal upgradation of primary schools to elementary level and secondary schools to senior secondary level:** The state has nearly achieved universal access to primary schools, except in certain Mand/Border/Kandi and Bet areas. Special strategies like the Education Guarantee Scheme (EGS) should be envisaged for these remote areas without accessibility to basic primary education. The focus should be now on achieving universalized accessibility at the elementary level and easy accessibility at the secondary level, by optimally merging the number of schools under two categories instead of four, i.e., one at the elementary level and the other at the secondary level. The government should make efforts to upgrade the maximum number of primary school to the elementary level and the secondary schools to senior secondary level, rather than creating totally new infrastructure. The expansion in the number of schools should be middle upwards. This has also been recently accepted as a major target by the state government (Punjab Education Policy, 2002). But how far it is implemented, is the real issue.
- 2. Rationalization and redistribution of staff:** At present, a major chunk of the expenditure on education is on salaries/state liabilities, leaving very little for actual development in education. The state government should try to utilize optimally the expenditure. Staffing in Punjab needs to be redistributed, restructured and rationalized. It is very important to upgrade the primary schools to middle level, so that the shortage of teachers at the former is compensated by the excess at the latter, the teacher-pupil ratio being lower at the middle level than at the primary level. The merging of the two levels will help in rationalizing the manpower required upto the elementary level. The secondary level should also be optimally upgraded to the senior secondary level. It seems that the total number of teachers recruited is not so much of a problem, the need is to ensure their proper and rationalized deployment. The convergence and merger of the four branches of education into two will reduce the workload of the education department and help in redistributing the number of teachers required at different levels.
- 3. Focus on pre-service/in-service teachers' training:** The government should enhance the competency and skills of the teachers by promoting pre-service and in-service training for them. DIETS (District Institution of Education and Training at elementary level)/GISTC's (Government In-service and Training Centres at secondary level) and other training institutions must be optimally utilized for this purpose. Such pre-service and in-service training programmes should be constantly reviewed and strengthened, as its quality has a direct bearing on the quality of education in the state.
- 4. Rationalizing teacher transfers:** Transfer of teachers in Punjab is not merely an administrative problem but also hits at the very core of the quality of education. One of the reasons for non-enrollment/dropouts is the single-teacher and teacher-less schools and persisting absenteeism. Influential teachers get themselves transferred to convenient locations, leaving behind a bunch of

schools which do not see the face of a teacher for months/years. So the need of a rational and transparent transfer policy cannot be over emphasized. The new education policy released by the state sets guidelines for teachers' transfers for the first time. These guidelines, which are pragmatic and practical, must be adhered to and implemented by the state.

5. **Focus on teacher empowerment:** The critical role of teachers in the entire education set-up must be realized. Emphasis should be made to address their professional development needs. Processes should be set up to initiate a participative mode for the teachers in the development of curriculum, text-book, teaching-learning material and methodologies. However, simultaneously the teachers have to be made more responsible and performance-oriented.
6. **Setting up an academic council:** There is need for an autonomous multi-member academic authority to undertake sample studies to collect data about the functioning of institutions and learning capabilities of students. It is necessary to make the education system more transparent. Action-research and policy development should be other concerns of this council. Members should include educationists, PRIs and school representatives, preferably teachers.
7. **School heads:** It is strange to note that there is no post of a headmaster in a middle school and some of the primary schools also function without any head. Apart from the non-availability of the post of a head, it is also the aptitude/attitude and vision of the school head which has a direct bearing on the quality of education. The present system of promotion for school headship is outdated. Teachers at the fag end of their service, when they prepare themselves for the bliss of retirement, get promoted to school headship. By that time they neither have the zeal nor the stamina to make any impact on the school under their charge. Moreover from teaching they are just thrown into an entirely new field of work which requires altogether new skills. So, not only must every school, have its head, but they must be sufficiently young, with enough years of service ahead in which they may translate their vision of the school into reality. The new education policy of the state has come out with such a programme, which must be implemented without delay.
8. **Revamping the curriculum:** There should be a special thrust to make education at elementary level useful and relevant for children. At present, it is highly regimented with uniform courses. The state has been blindly following the national curriculum without considering the special conditions at the grassroot level of Punjab. Hence modernization of the syllabus with more flexibility in the choice of subjects is recommended. Curriculum framework should be based on compulsory and flexible subjects, wherein the children have the choice to opt for the subject of their interest. It will help in reducing the weight of the school bag. It is recommended that the subjects, which do not have practical value in day to day life could be listed as optional. In fact there should be a continuous review of the utility of the curriculum from time to time. Further, there is need to emphasize on moral values and iterate their importance in everyday life.
9. **Need for reforms in examination/evaluation system:** It is important to review the current examination system and consider possible alternatives of bringing reforms in it. At present, the emphasis in education is on theory which is

encouraging rote-learning without basic understanding. More practical work and activities should be encouraged, which would also discourage mass copying and rote-learning. It will be appropriate to adopt a regular grading system and emphasize on the year-long classroom work, instead of evaluating only on the basis of annual examinations. This will increase the attendance rate and the knowledge of the students.

10. **Provision of infrastructure/optimum utilization of the existing infrastructure:** Efforts should be made to bridge the infrastructural gaps. Schools should raise resources through voluntary organizations and panchayats, with the state government providing matching grants. The state should also endeavour to optimize utilization of existing infrastructure in schools, by merging the school education at two levels--elementary and secondary-- which would help in maximizing the utilization of the existing infrastructure. Introducing a shift system and using the existing buildings and teachers for open learning/non-formal education in the evening are the other methods of utilizing the existing infrastructure.
11. **Changing the mindset of parents:** As far as the social and cultural handicaps of enrollment and retention of girls in schools is concerned, the NGOs and PRIs need to be associated effectively to initiate an attitudinal change in the parents of the girl child.
12. **Enhance incentives to all children in government schools:** The various *incentives being provided by the government* should be for all children, irrespective of caste criteria (as being adopted today) to achieve the goal of universalization of education.
13. **Promoting free lunch:** Interaction with the parents in the various districts of Punjab and the government machinery of the departments concerned have led to the recommendation that, although the mid-day meal scheme is not achieving the desired results and encourages the children to sell off wheat on the way from the school to their homes, it is felt that some sort of packed, cooked and nutritious food should be supplied to children to attract them and retain them in the schools.
14. **Adult literacy programmes should be merged with SSA:** This will help in effective functioning and optimum utilization of resources. There should be timely release of the Centre's and the State's share of funds and regular monitoring of these programmes at the state as well as district level.
15. **English should be started in class 6:** According to the new Education Policy of the state, the English language has to be started in class 3 in government schools. But it is strongly felt that it is difficult for the child to bear the burden of an additional language at such a tender age. His understanding capacity is limited in the formative years and, therefore, it is strongly recommended that English should be started in class 6 and not in class 3. The English language cannot be avoided, but emphasizes needs to be given to the mother tongue, especially in the formative years.

16. **Village as unit of planning:** To initiate a community-based approach, village should be the lowest unit for planning education. Village plans should converge to form the District Educational Plans.
17. **Decentralization and community participation:** The state government should take effective steps to encourage transfer of elementary educational institutions to the PRIs and urban local bodies, in a bid to empower the community and other stakeholders. It is essential that control of schools and teachers should be transferred to local bodies, which have a direct interest in teachers' performance. Efforts should be made to involve the community in education development through VEDCs. The state's efforts at decentralizing powers to VEDCs for running the SSA programmes in villages should be replicated in other educational programmes too. Decentralization will actually be achieved only when the panchayats, VEDCs and UEDCs become fully autonomous, with full financial powers to plan, manage and control the school affairs. It is also important to enlarge and strengthen the role and participation of PTAs/MTAs in schools.
18. **Increased allocation/resource mobilization for education:** The state should substantially increase public investment and encourage and private investments in education, so that it rises to six per cent of the national income by the year 2007. It is, however, important that money is spent on increasing access to schools, infrastructure, monitoring, inspection, management and development of education rather than merely on salaries.
19. **Private initiatives have to be facilitated:** In recent times, a tendency has developed in people to send their children to private schools. There is need to facilitate and encourage private bodies to share the responsibility with government. It is, however, very important to ensure that minimum standards of quality of education are maintained in the private schools.
20. **Monitoring and evaluation:** An institutionalized mechanism has to be set up for regular inspection, monitoring and follow-up. A school gradation and evaluation system, initiated by the state from this year, is a welcome step, which needs to be institutionalized. A similar system of appraisal of teacher and school heads must also be put in place. One needs a local-level body or institution to monitor the performance of teachers.
21. **Participative field studies should be undertaken:** At present not much research on education is being undertaken in Punjab, at the grassroots level. So, to identify the requirements of planning, measure the effectiveness of various schemes, evaluate the measures undertaken by the state to improve quality of education and curriculum, it is important to expand research, which will reveal the ground realities. Government should also probe into such areas as relevance of education in daily life and public perception of government schools.

HIGHER EDUCATION: HISTORICAL BACKGROUND AND DEVELOPMENT

Historical background

Independent India inherited a higher education system with strong colonial legacies. The planners of India were, therefore, faced with the immediate challenge of bringing about a basic transformation in its educational system to fulfill the developmental needs of the country. The educational planners had recognized the bi-directional linkages between education and development. The need for a literate workforce was considered to be as essential in this context as the education and training of an adequate pool of highly skilled manpower. Considerable emphasis was also given to higher education to strengthen the educational system as a whole, and particularly to scientific and technological components therein, so as to meet the requirements of high-level capabilities in the realm of knowledge as well as skills. To achieve these objectives, the University Grants Commission (UGC) was set up as the apex national organization concerned with the establishment and maintenance of standards in higher education. The UGC acts as a vital link between the policy-making bodies of the government and institutions of higher education (Raza, 1991, pp.32-33). Some of the recommendations of different commissions on education (given below) which have influenced policies, planning and development in higher education, are discussed in this section:

- Report of the University Education Commission, 1948-49.
- Report of the Education Commission, 1964-66.
- National Policy on Education, 1968.
- National Policy on Education, 1986.
- Education Reforms Commission, Punjab, 1985.

The broad areas and recommendations on higher education and their institutions concerned, covered by these commissions, are: (1) aims and objectives of institutions of higher education; (2) their management and governance; (3) assuring quality and standards in these institutions; (4) achieving equity and access through them; (5) their funding pattern; and (6) reforms in the existing system and distance higher education, etc. National Policy on Education (1968) reinforced the recommendations of the Education Commission (1964-66) on reconstruction of education to relate it more closely to the life of the people, in the context of (a) continuous efforts to expand educational opportunities; (b) a sustained and intensive effort to raise the quality of education; (c) emphasis on development of science and technology; and (d) cultivation of moral and social values. Later, the National Policy on Education (1986) visualized that higher education should become dynamic with the (a) consolidation and expansion of institutions, (b) development of autonomous colleges, (c) re-designing of courses, (d) training of teachers, (e) strengthening research, and (f) improvement in efficiency and management.

Basic Problems of Higher Education

As higher education in the country, as well as in Punjab, grew in size, its problems and prospects too increased both in numbers and size, and its relevance to development and especially to the socio-economic needs of the society increasingly became issues of debate. Comparing the situation of higher education in other states and at the all-India level, its development in Punjab is seen to be relatively superior. But there are problems,

such as imbalanced and unplanned institutional growth, lack of infrastructural facilities, excessive and discriminatory system of admissions, financial constraints, placement of degree holders, irrelevant course content and gap between general and professional courses. Hence, there is need for various changes, modifications, adaptations, orientations and innovations.

Development of Higher Education

Punjab has a long history of higher education -- whether formal or non-formal -- of a traditionally progressive and forward-looking educational system. The reorganized state of Punjab (1966) has experienced a large number of changes in its size, social fabric and economy. These are directly linked with the development of education in the state. The structure and system of higher education in the state has followed the national pattern, such as college and university education in general and professional degrees. The current position of higher education in Punjab, although, considered as the core sector for achieving the objective of employment for an individual, is also oriented towards socio-economic, environmental, and human resources development.

Status of (General and Professional) Higher Education: Trends

Universities: The development of university education has been examined in Table 30.

Table 30
Growth of Universities

Years	Universities*		
	General	Technical,** Medical, Veterinary*** and Agriculture	Total
1971-1980	3	1	4
1981-1990	3	1	4
1991-2000	3+	4	7

Source: *Statistical Abstract of Punjab 2001-2002*, Economic Advisor to Govt. of Punjab, Chandigarh, PP. 510-512, and Department of Higher Education, Punjab, Chandigarh (Unpublished)

Notes: * Amritsar-1, Jalandhar-1, Ludhiana-1, Faridkot-1, Patiala-1, Talwandi Saboo 1, and + Chandigarh-1

** providing degrees — B.E, B.Tech, B.Arch, B.B.A, B.C.A, M.C.A and M.B.A. through professional colleges.

*** providing degrees — M.B.B.S, B.D.S, B.A.M.S, B.Sc (Nursing), B.H.M.Sc, M.Sc/M.S/M.D, etc., and degrees in veterinary sciences through universities departments or professional colleges.

Seven universities serve Punjab. Panjab University, Chandigarh, Punjabi University, Patiala and Guru Nanak Dev University, Amritsar, impart general as well as professional education. The range, diversity and sophistication of subjects offered by these universities are the same as anywhere in the country. Punjab Agriculture University at Ludhiana is well known for its contributions to education, research and extension services in the field of agriculture. Punjab Technical University at Jalandhar, Punjab Medical University at Faridkot, and Punjab Veterinary University at Talwandi Saboo are in the process of being established exclusively for technical education, medical and veterinary sciences. In addition, there exists another institution offering higher learning in medicine, namely, the Postgraduate Institute of Medical Education and Research,

Chandigarh. These universities and institutes are autonomous bodies, created by Acts of State/Central Legislatures. Punjab University and the Postgraduate Institute of Medical Education and Research, Chandigarh, are both in a slightly different position, in respect of their governance and financial aids or grants. Since, they also serve Punjab, as such, it would be legitimate for us to include a reference to these matters in the discussion here.

In quantitative terms, the increase in the number of institutions of higher education in Punjab has been spread equally across universities imparting arts/sciences/commerce, technical and professional education. The facilities they provide, however, appear to be inadequate to meet the present requirement, especially for the population of rural areas, as these are all located in urban areas. In qualitative terms, standards of attainments of most of these universities are comparable with that elsewhere. Nevertheless, there is need and scope for further improvement in respect of their goals and pursuit of excellence. Views of the members of the faculty, administrative staff and students of different universities highlight great scope for introducing changes in higher education, for improving the performance of the system and making it more relevant to the needs of the day. The structure of governance of the universities in Punjab has followed the pattern evolved by other universities in the country, and based on the model developed in Europe. Hence here is no need to suggest any change in the university structure, but it is imperative to follow a pattern, which has international acceptance.

Colleges

There are a sufficient number of colleges in the state and most of them are affiliated to one or the other of the seven universities of Punjab. Table 31 highlights the growth of colleges during the last three decades.

Table 31
Distribution of Recognized Colleges according to Courses of Study

Years	Arts, Commerce and Home Science Colleges			Science, and science			Engineering, Technology and Architecture Colleges			* Medical (Allopathic only) and Veterinary Colleges			Teachers Training Colleges (B.Ed)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total			
1971-80	110	52	162	3	-	3	5	-	5	12	6	18			
1981-90	118	53	171	3	-	3	5	-	5	12	6	18			
1991-00	131	73	204	16	-	16	6	-	6	13	9	22			

Source: *Statistical Abstract of Punjab 2001*, Economic Advisor to Government of Punjab, Chandigarh, PP. 510-511

Note: * Perspective Plan of Department of Technical Education, on Industrial Training, *Punjab-Vision 2020 Report* defined 19 Engineering Colleges, 41 Polytechnics/Institutions including Pharmacy Institutes and 129 Industrial Training Institutes in Punjab

Undergraduate teaching is mostly undertaken in the affiliated colleges (whether government, private aided or private unaided). Though these colleges mostly confine themselves to undergraduate teachings, some also offer postgraduate courses. Besides, some universities also provide education facilities at graduate and postgraduate levels, through correspondence courses and evening colleges.

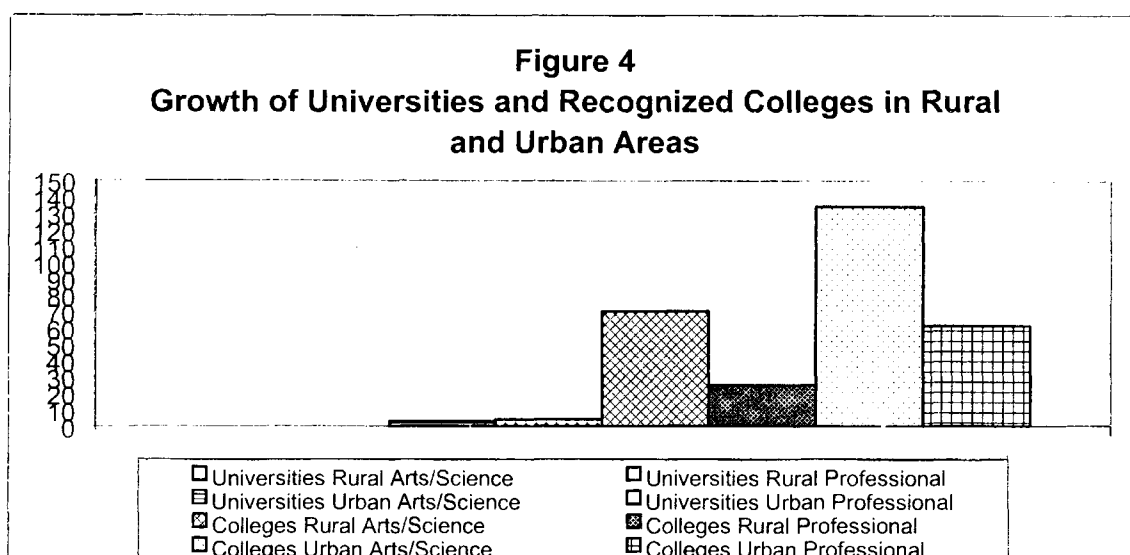
Figures in Table 32 show considerable gap between the existing numbers of rural and urban colleges in Punjab. The ratio between urban and rural colleges is nearly 1:2 as calculated from the given data.

Table 32
Number of Recognized Colleges Located in Rural and Urban Areas

Colleges	1998			1999			2000		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Arts, science, Home science including and Commerce	63	130	193	64	132	196	70	134	204
Teachers training	3	17	20	3	18	21	4	18	22
Medical/Para-medical	6	21	27	4	20	24	11	26	37
Agriculture	--	2	2	--	2	2	--	2	2
Engineering/Architecture	8	8	16	8	8	16	9	7	16
Veterinary Sciences	--	1	1	--	1	1	--	1	1
Physical education	1	2	3	1	2	3	1	2	3
Oriental*	--	2	2	--	2	2	--	2	2
Total	81	183	264	80	185	265	95	192	287

Source: *Economic Survey of Punjab 2001*, Director, Public instructions, Colleges, Punjab

Note: *Sanskrit Mahavidhyalas



Source: *Economic Survey of Punjab 2001*, Director, Public instructions, Colleges, Punjab, 2002.

Along with the growth in numbers of universities, there has been a corresponding growth in numbers of affiliated colleges. The number of colleges of general education (Arts, Science, Commerce and Home Science) increased from 162 in 1971-80 to 204 in 1991-2000. Similarly, during the same period, colleges of engineering and technology, medical colleges and colleges of teachers training increased from 26 to 83. This increase in numbers reveal unplanned and unbalanced institutional growth. Imbalances have been observed even in the expansion of faculties, with a greater number of arts, science and commerce colleges than other professional degree colleges. This imbalance in institutional growth calls for serious attention. District-wise information regarding the establishment of colleges is given in Table 33.

Table 33
District-wise Status of Recognized Colleges according to Courses of Study (2000-2001)

Districts	Arts, Science, Commerce and Home science Colleges			Engineering, Technology and Architecture Colleges			Medical (Allopathic only) Colleges			Teachers Training Colleges (B.Ed)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Gurdaspur	9	7	16	1	-	1	-	-	-	1	-	1
Amritsar	13	7	20	-	-	-	2	-	2	1	1	2
Kapurthala	11	6	17	-	-	-	-	-	-	1	1	2
Jalandhar	12	8	20	1	-	1	-	-	-	2	-	2
Nawan Shehar	4	3	7	1	-	1	-	-	-	-	1	1
Hoshiarpur	12	5	17	-	-	-	-	-	-	1	-	1
Rupnagar	7	2	9	2	-	2	-	-	-	-	-	-
Ludhiana	14	16	30	2	-	2	2	-	2	2	4	6
Ferozepur	8	3	11	1	-	1	-	-	-	1	1	2
Faridkot	2	-	2	1	-	1	1	-	1	1	-	1
Mukatsar	4	3	7	1	-	1	-	-	-	1	-	1
Moga	4	3	7	1	-	1	-	-	-	1	1	2
Bathinda	5	4	9	1	-	1	-	-	-	-	-	-
Mansa	3	1	4	-	-	-	-	-	-	-	-	-
Sangrur	10	3	13	1	-	1	-	-	-	-	-	-
Patiala	10	2	12	2	-	2	1	-	1	1	-	1
Fatehgarh Sahib	3	-	3	1	-	1	-	-	-	-	-	-

Source: Statistical Abstract of Punjab 2001, Economic Advisor to Government of Punjab, Chandigarh

STATUS OF TECHNICAL AND PROFESSIONAL (VOCATIONAL) EDUCATION

Besides the above professional institutions, it is imperative to discuss briefly the technical institutions, such as polytechnics and Industrial Training Institutes that impart technical and industrial training as well as paramedical and veterinary sciences education. The Department of Technical Education and Industrial Training looks after 16 engineering colleges (13 government and three affiliated private and three private), 41 polytechnics/ institutions including Pharmacy (diploma level institutions), and Hotel Management institution and about 129 industrial and vocational centres at the ITI level. Every year a total of about 2,800 engineers, 5,300 diploma holders and about 16,800 craftsmen at the certificate level are being trained by these technical institutes. Besides, three engineering colleges, seven polytechnics and 33 new industrial training institutes are in the pipeline at various levels of establishment in the state.

The Directorate of Medical Education and Research, Punjab, governs medical education and research in the state. The directorate was set up to develop medical manpower and to ensure that medical education and teaching hospitals received adequate attention and proper facilities for research in various branches of medicine. To develop super-specialists, teachers from the level of senior lectures and above are sponsored to the Post-graduate Institute of Medical Education and Research, Chandigarh and the All India Institute of Medical Sciences, New Delhi, for postgraduate courses (*Annual Plan-2001*, Punjab). These developments indicate that the Government of Punjab considers professional education, and especially industrial training, as high priority. In the circumstances, action needs to be initiated on different fronts to make the technical education system responsive to the needs and requirements of industry. Participation of the private sector needs to be encouraged for continuous up-gradation and expansion of HRD facilities. Keeping in view the expansion of technical higher education, besides the

promotional activities of Punjab Technical University in the field of professional education it is necessary to establish a higher-level apex body like IIT as a separate unit.

Status of Students' Enrollment and Placement

Table 34 shows the fast growth of enrollment of students between 1971 and 2000 and this indicates the high demand for more institutions of higher education.

Table 34
Growth of Students' Enrollment

Years	Postgraduate Students			Graduate Students		
	Total enrollment	Increase over the preceding Decades	Decade's-percentage increased	Total enrollment Increased	Increase over preceding decades	Decade's-percentage increased
1971-80	6901	-	-	84353	-	-
1981-90	7313	412	6.0	86501	2148	2.54
1991-2000	13848	6535	89.3	179817	93316	107.88

Source: *Statistical Abstract of Punjab-2001*, Economic and Statistics Organization, Punjab

The data reveal that the number of enrollments at the postgraduate and graduate levels has increased from 6,901 to 13,848 and 84,353 to 1,79,817 within three decades. Further, the decade 1991-2000 shows manifold increase in enrollments. The contradictions of the current position of fast expansion at degree level, especially in arts, science and commerce courses, are shown in Table 35. The high rate of students' enrollment in various courses also highlights inaccessibility to job opportunities.

Table 35
Number of Students in Different Courses of Study

Years	Ph.D			M.Phil @			M.A			M.Sc		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1971-80	56	46	102	138	140	278	2852	2985	5837	338	319	657
1981-90	74	74	148	263	355	618	2176	3115	5291	500	636	1136
1991-2000	102	170	272	18	51	69	3421	7553	10974	580	1349	1929

Continued...

Years	M.com			B.A/B.A (Hons)			B.Sc/B.Sc (Hons.)			B.Com/B.Com (hons)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1971-80	22	5	27	33436	27535	61071	7780	3395	11175	5162	324	5486
1981-90	61	59	120	26590	33867	60457	5175	4457	9632	5955	2714	8669
1991-2000	153	441	594	56218	67037	123255	7207	8380	15587	11536	10027	2156

Continued...

Years	B.E/B.Sc (Eng.) B.Arch./B.Tech			M.B.B.S			B.Ed		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1971-80	1676	31	1707	1629	587	2216	1009	1689	2698
1981-90	1943	168	2111	1312	990	2382	1007	2243	3250
1991-2000	10787	2444	13231	1327	1186	2513	1079	2589	3668

Source: *Statistical Abstract of Punjab 2001*; Economic Advisor to Government of Punjab, Chandigarh, pp. 520-524

Note: @ The decrease of enrollment in M.Phil is due to closing of M.Phil classes in Punjabi University, Patiala and GND University, Amritsar

A high percentage of enrollment in arts and science colleges (89.25%) is evident from Table 35-A. It also indicates a high rate of incidence of unemployment among non-technical graduates and undergraduates.

Table 35 A
Course-wise percentage of Enrollment

Courses	Percentage
Arts and science colleges	89.25
Teachers training colleges	1.49
Medical colleges	2.92
Agriculture colleges	0.46
Engineering colleges	5.29
Veterinary colleges	0.25
Physical education colleges	0.27
Oriental colleges	0.07

Source: *Economic Survey of Punjab 2001-2002*; Economic Adviser Government of Punjab, Chandigarh, P. 36 and P. 153

In practice, near about 80 per cent of the total students are compelled to take admission at degree level in arts, science and commerce subjects. This is because such courses are not organized on the basis of established manpower needs and demands by various developmental sectors. Hence, there is need to restructure the admission system in different courses to improve the status of employability of graduates and postgraduates. Besides, there should be two streams of courses--vocational and general--at the first-degree level, at least for the next two decades or so, as an interim measure. (The Education Commission 1964-66 has already given this suggestion). This endeavor may help in reducing the unwanted rush of students for higher-level arts/sciences courses. Provision for offering courses of functional utility, with a vocational bias, may be helpful to those who wish to end their studies with a pass degree and are not willing to pursue further education. Vocationally motivated students could then find gainful employment or be self-employed in vocations of their own choice after the completion of +2 school stage. If they wish to continue their education, they may go in for general education, or may proceed to polytechnics for diploma or certificate courses in technical, professional or any other skill-formation courses. Therefore, vocational courses at the first-degree level need to be enriched and diversified. By this effort, government or private institutions would definitely reduce the educated unemployment level and equip students for self-employment, while giving the highest priority to vocational sectors.

District-wise enrollment of students in postgraduate and graduate courses as given in Table 36 show the trend and pattern of enrollment in different faculties.

Table 36
District-wise enrolment of Students in Different Courses of Study (2000)

Districts	Ph.D			M.Phil			M.A			M.Sc		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Gurdaspur	-	-	-	-	-	-	37	241	278	-	-	-
Amritsar	61	68	129	5	19	24	366	1012	1378	278	555	833
Kapurthala	-	-	-	-	-	-	74	213	287	-	-	-
Jalandhar	-	-	-	-	-	-	440	1633	2073	140	261	401
Nawan Shehar	-	-	-	-	-	-	15	20	35	-	-	-
Hoshiarpur	-	-	-	-	-	-	554	998	1552	4	6	10
Rupnagar	-	-	-	-	-	-	60	106	166	-	-	-
Ludhiana	-	24	24	-	-	-	1011	2050	3061	11	144	155
Ferozepur	-	-	-	-	-	-	114	190	304	-	-	-
Faridkot	-	-	-	-	-	-	44	45	89	-	-	-
Mukatsar	-	-	-	-	-	-	48	22	70	-	-	-
Moga	-	-	-	-	-	-	-	-	-	-	-	-
Bathinda	-	-	-	-	-	-	20	41	61	24	-	24
Mansa	-	-	-	-	-	-	21	4	25	-	-	-
Sangrur	-	-	-	-	-	-	123	77	200	-	-	-
Patiala	41	78	119	13	32	45	490	882	1372	123	383	506
Fatehgarh Sahib	-	-	-	-	-	-	4	19	23	-	-	-

Continued...

Districts	M.com			B.A/B.A(Hon.)			B.Sc/B.Sc(Hon.)			B.com/B.com (Hon.)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Gurdaspur	21	36	57	4230	6951	11181	1009	1105	2114	724	603	1327
Amritsar	29	89	118	4274	6002	10276	1416	1566	2982	1526	1220	2746
Kapurthala	-	-	-	1997	3879	5876	103	103	206	407	565	972
Jullandhar	45	132	177	4710	8430	13140	1051	783	1834	1841	1362	3203
Nawan Shehar	9	10	19	1438	1841	3279	91	116	207	268	190	458
Hoshiarpur	1	8	9	4542	5131	9673	616	672	1288	714	576	1290
Rupnagar	-	-	-	2193	1745	3938	188	225	413	357	283	640
Ludhiana	26	42	68	6856	14056	20912	868	1742	2610	2118	2377	4495
Ferozepur	-	-	-	4306	3151	7457	301	430	731	359	351	710
Faridkot	-	-	-	1436	467	1903	115	130	245	497	227	724
Mukatsar	-	-	-	1809	1655	3464	90	102	192	190	26	216
Moga	-	-	-	2072	2100	4172	98	119	217	168	188	356
Bathinda	-	-	-	3273	1862	5135	593	421	1014	593	421	1014
Mansa	-	-	-	1306	636	1942	-	-	-	171	114	285
Sangrur	-	-	-	5450	3278	8728	375	319	694	425	364	789
Patiala	22	124	146	5399	4923	10322	248	455	703	996	1012	2008
Fatehgarh Sahib	-	-	-	927	930	1857	43	92	137	182	148	330

Continued...

Districts	B.E/B.Sc (Eng.) B.Arch./B.Tech.			M.B.B.S			B.Ed.		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Gurdaspur	799	208	1007	-	-	-	27	33	60
Amritsar	-	-	-	456	454	910	85	284	369
Kapurthala	-	-	-	-	-	-	106	204	310
Jullandhar	896	154	1050	-	-	-	130	200	330
Nawan Shehar	119	42	161	-	-	-	-	100	100
Hoshiarpur	-	-	-	-	-	-	151	149	300
Rupnagar	937	321	1258	-	-	-	-	-	-
Ludhiana	1015	169	1184	327	284	611	175	825	1000
Ferozepur	841	137	978	-	-	-	136	304	440
Faridkot	566	194	760	109	97	206	35	45	80
Mukatsar	528	130	658	-	-	-	56	44	100
Moga	548	124	672	-	-	-	113	286	399
Bathinda	830	279	1109	-	-	-	-	-	-
Mansa	-	-	-	-	-	-	-	-	-
Sangrur	1876	341	2217	-	-	-	-	-	-
Patiala	1272	239	1511	435	351	786	65	115	180
Fatehgarh Sahib	560	106	666	-	-	-	-	-	-

Source: *Statistical Abstract of Punjab 2001*; Economic Advisor to Government of Punjab, Chandigarh,

The data show that there is an increasing interest among pupils towards technical and vocational education. The increased number of technical and professional institutions, as shown in previous tables, indicates that the Department of Education and Universities has started different professional courses, which have been gradually on the increase during consecutive decades. The data also reveal that the enrollment in professional streams is gradually increasing, with a corresponding decrease in general education in both rural and urban areas, as well as among male and female students.

Figures on enrollment indicate that the growth of graduates in Commerce has increased faster in the previous decades than that of Arts and Science courses. This shows the students' interest in professional courses, especially Commerce, which generates better job opportunities for professionals, in both public and private sectors (especially in industrial and banking sectors). Data reveal that higher numbers of students are interested to enter professional courses at the postgraduate level than the graduate level. No comprehensive studies are available about wastage and stagnation at higher levels of education in Punjab. Small sample studies have, however, been conducted by some scholars, who have come to the conclusion that wastage and stagnation are particular characteristics of the modern system of general education. This has generated frustration among students, parents and teachers. The situation worsens further when unsuccessful dropouts are compelled to enter the employment market, which does not have ready jobs even for successful first-graders. So, higher numbers of failures on the one hand and low standard of academic performance on the other have reduced the efficiency of higher education. This situation is also true of Punjab and, therefore, needs serious attention.

Concerned with higher education and placement of students, the Education Commission 1964-66 recommended the need to strengthen linkages between higher education and productivity, which leads to socio-economic development. There is no follow-up record of higher-level degree holders available in published or unpublished form; therefore, it is difficult to assess the social and economic relevance of higher degrees. The existing

educational system has not undergone any change, nor has it any direct linkage with the socio-economic needs of the people. Hence, a tremendous gap has developed between the supply and demand of an educated workforce. In this context, some studies highlight a large surplus of degree holders who could not find a suitable place in the employment market, since they do not possess the relevant education or skill formation needed on the job market.

RELEVANCE AND ACCESS OF HIGHER EDUCATION TO THE DISADVANTAGED

The Education Commission (1964-66) rightly stated, 'Indian society is hierarchical, stratified and deficient in vertical mobility. The social distance between the different classes, particularly between rich and poor, the educated and the uneducated, is large and is tending to widen ...' Similar is the situation in Punjab, and this complex character of the population affects the socio-economic development of the state. People living in rural areas, and especially Scheduled Castes and Backward Castes and other economically weaker sections of society, are exploring the same educational opportunities as the other castes, because of lack of financial support. Although the number of women students in all the subjects at the higher level is increasing relatively in successive decades, the equality of women and men remains an issue of debate in relation to higher education. This demands immediate attention. In this context, the National Policy on Education (1986) has rightly emphasized the need for removal of disparities and equalization educational opportunities for all sections of society. Table 37 shows the gap between total enrollment and that of women and Scheduled Castes. In Punjab, the Scheduled Castes population is more than 33 per cent, but comparatively, their enrollment at postgraduate and graduate levels is significantly low. Their enrollment in different courses of studies is quite uneven, such as 86.27 per cent in arts/sciences/commerce, 2.93 per cent in teachers' training, 4.30 per cent in medical and paramedical sciences, 0.54 per cent and 5.03 per cent in agriculture and engineering (*Economic Survey of Punjab*).

Table 37
Women and Scheduled Castes' Enrollment in Higher Education

Year	Postgraduate Students' Enrollment				
	Total enrollment	Women enrollment	Scheduled Castes enrollment	Women as percent of total	Scheduled Castes as percent of total
1971-80	6901	3495	513	50.6	7.4
1981-90	7313	4239	745	57.6	10.1
1991-00	13848	9564	1313	69.6	9.1
	Graduate Students' Enrolment				
1971-80	84353	33661	7302	39.9	8.9
1981-90	86510	44439	9801	51.4	11.3
1991-00	179817	91663	18555	51.0	10.3

Source: *Statistical Abstract of Punjab-2000*; Economic and Statistics Organization, Punjab.

It is evident that despite government's efforts, the enrollment of women and Scheduled Castes students is still far behind that of the general castes. Reasons for the educational backwardness of women and Scheduled Castes are mainly: (i) economic and social status of the families; (ii) lack of interest and inadequate backup by family or society; (iii) medium of instructions imparted in colleges and universities; and (iv) negative attitude of the students. Although the proportion of women and Scheduled Castes availing higher education has increased in relative numbers, there is still need to encourage them to go in for higher education.

REGIONAL (DISTRICT-WISE) IMBALANCES

Besides other educational variables, the dimension of regional disparities in facilities of higher education available is also noteworthy. Table 38 shows that these vary from district to district. There are a few districts, which have far better educational facilities than others, in relation to the actual requirements of the existing population. In Punjab, the 17-23 years age group population constitutes 14 per cent of the total. Table 38 presents figures of district-wise population of the age group 17-23 years, who have availed of higher education.

Table 38
Educational Facilities in Districts in Relation to Population

Districts	Population Total	Population 17-23	Universities*	Colleges	Enrollments					
					Postgraduates			Graduates		
					Total	Total %	17-23 %	Total	Total %	17-23 %
Gurdaspur	2096889	293565	-	18	335	0.01	0.11	15689	0.75	5.34
Amritsar	3074207	430289	1	28	2482	0.08	0.6	17283	0.51	4.01
Kapurthala	752287	105320	-	19	287	0.04	0.3	7364	0.97	7.10
Jalandhar	1953508	273491	1	26	2651	0.13	1.00	19557	1.00	7.20
Nawan Shehar	586637	82129	-	11	54	0.009	0.11	4205	0.74	5.21
Hoshiarpur	1478045	206926	-	18	1571	0.10	0.81	12551	0.84	6.15
Rupnagar	1110000	155400	-	11	166	0.01	0.11	6249	0.56	4.02
Ludhiana	3030352	424249	1	40	3308	0.10	0.87	30812	1.01	7.31
Ferozepur	1744753	244265	-	16	304	0.01	0.12	10316	0.60	4.22
Faridkot	552466	77345	1	9	89	0.01	0.11	3918	0.70	5.15
Mukatsar	776702	108738	-	11	70	0.009	0.64	4630	0.59	4.25
Moga	886313	124083	-	16	10	0.002	0.05	5816	0.65	4.68
Bathinda	1181236	165373	1	14	85	0.007	0.05	8272	0.70	5.00
Mansa	688630	96408	-	7	25	0.003	0.03	2227	0.32	2.30
Sangrur	1998464	279785	-	16	200	0.01	0.07	12428	0.62	4.44
Patiala	1839056	257468	1	21	2188	0.11	0.84	15510	0.84	6.62
Fatehgarh Sahib	539751	75565	-	6	23	0.004	0.03	2990	0.55	4.00
Punjab	24289296	3400501	6	287	13848	0.05	0.40	179817	0.74	9.28

Source: *Census Operation 2001; Punjab Series-17 and Statistical Abstracts-2001*, Government of Punjab, PP. 510-524.

Note: Punjab University, Chandigarh is not included in the table
 Medical colleges: Patiala-1, Amritsar-1, Faridkot-1, Ludhiana -2
 Engineering colleges: one each at Ludhiana, Patiala, Jalandhar, Longowal, Gurdaspur, Faridkot, Malout, Mohali, Fatehgarh Sahib and Bathinda. Besides one medical college and one engineering college are also located at Chandigarh

* Estimated population calculated from year age group return, (1991 census), indicating 14% of total population - 2001 Census

The data in Table 38 show that out of the six universities located in Punjab, three are in the adjoining districts of Ludhiana, Jalandhar and Amritsar. These districts are far better-off in their socio-economic and educational conditions and are considered to be developed districts of the state. Punjabi University, located at Patiala, is the only university, which provides educational facilities to some underdeveloped districts of Punjab. Punjab Medical University and Punjab Veterinary Sciences University, located at Faridkot and Talwandi Saboo respectively, are basically meant for human health and veterinary sciences. These two universities cater to a very small area of Punjab. Mansa, Sangrur, Gurdaspur, Mukatsar and Ferozepur are classified as backward districts and have very limited facilities of higher education. This shows that the universities located in Punjab basically promote higher education in developed and particularly in urban areas. This perpetuates regional (district-wise) disparities in higher education in the state. Besides, it is also notable that most of the engineering and medical colleges in the state are situated in urban areas of developed districts. This means that the backward districts need to be considered for thoughtful planning by the state government for the development of higher education. The quantitative information supplied by the Education Department gives the impression that there is need to establish more colleges and universities for bringing about a balance between developed and underdeveloped, and urban and rural populations. Since Punjab is passing through a financial crisis, it is suggested that the state should not establish new higher educational institutions, but should use existing infrastructure for opening new sections for higher students' enrollment in a shift system.

GROWTH OF TEACHING STAFF

Along with the expansion of institutions and students, there has been a corresponding growth in the number of teachers in the universities and colleges, from 483 and 6,052 (1971-1980) to 839 and 10,057 (1991-2000) respectively as Table 39 highlights.

Table 39
Number of Teachers in Universities and Colleges, 1971-2000

Decades	Universities			Arts, Science, Commerce and Home science colleges			Engineering, Technology and Architecture colleges			Medical colleges (Allopathic only)			Teachers' Training colleges (B.ed)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
1971-80	398	85	483	3105	1604	4709	241	4	245	598	228	826	154	118	272
1981-90	504	115	622	3401	2653	6052	252	16	268	849	257	1106	125	130	255
1991-00	613	226	839	3421	3804	7225	866	208	1074	872	492	1364	108	286	394

Source: *Statistical Abstract of Punjab 2001*; Economic Advisor to Government of Punjab, Chandigarh.

Table 40 shows the district-wise number of teachers in recognized colleges according to courses of study.

Table 40
District-wise Number of Teachers in Recognized Colleges according to Courses of Study (2000)

Districts	Arts, Science, Commerce and Home science Colleges			Engineering, Technology and Architecture Colleges			Medical Colleges (Allopathic only)			Teachers Training Colleges (B.Ed)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
Gurdaspur	273	258	531	48	7	55	-	-	-	1	7	8
Amritsar	388	413	801	-	-	-	196	114	310	11	39	50
Kapurthala	205	194	399	-	-	-	-	-	-	11	21	32
Jullandhar	455	643	1098	78	17	95	-	-	-	11	25	36
Nawan Shehar	107	89	196	13	4	17	-	-	-	4	7	11
Hoshiarpur	325	249	574	-	-	-	-	-	-	14	6	20
Rupnagar	109	171	280	60	39	99	-	-	-	-	-	-
Ludhiana	473	778	1251	204	17	221	396	280	676	17	88	105
Ferozepur	189	165	354	48	14	62	-	-	-	15	38	53
Faridkot	58	34	92	28	9	37	109	33	142	5	6	11
Mukatsar	71	75	146	35	10	45	-	-	-	7	5	12
Moga	47	101	148	27	15	42	-	-	-	7	30	37
Bathinda	132	120	252	63	14	77	-	-	-	-	-	-
Mansa	51	30	81	-	-	-	-	-	-	-	-	-
Sangrur	240	147	387	133	20	153	-	-	-	-	-	-
Patiala	250	301	551	103	32	135	171	65	236	5	14	19
Fatehgarh Sahib	48	36	84	26	10	36	-	-	-	-	-	-

Source: Statistical Abstract of Punjab-2001; Government of Punjab.

The trend in recruitment of teachers reveals that the number of teachers in the universities and colleges has increased three-fold within the last three decades. Information available from the Higher Education Department, Government of Punjab, explains that the current situation has become variable (decrease or stagnation), because of limited funds and non-availability of grants on time. The number of students per teacher (teacher-pupil ratio) appears acceptable on the aggregate as Table 41 highlights:

Table 41
Student-teacher Ratio

Decades	University Teachers			College Teachers		
	Students	Teachers	Ratio	Students	Teachers	Ratio
1971-80	6901	483	14:3	84353	6052	13:9
1981-90	7313	622	11:8	86501	9239	9:4
1991-00	13848	839	16:9	179817	10057	17:9

Source: Statistical Abstract of Punjab-2001; Economic and Statistics Organization, Punjab.

At most levels, the existing pupils-teacher ratio in the state conforms to the norms laid down by the Education Commission (1964-66). The existing number of teachers at university and college levels appears to be sufficient, with a reasonable a good ratio of 17 and 18 students per teacher. This suggests that, for the next two decades, no new appointment of teachers may take place at university and college levels, except for replacement of retirement, or any other unforeseen happenings, even though the number of students will keep on rising, both as a result of the natural growth in students and a decline in the dropout rate.

EFFICIENCY, STANDARDS AND QUALITY OF HIGHER EDUCATION SYSTEM

Higher education contributes to the development of every area by providing educated and trained manpower for its economic and industrial set-up. Thus, higher education and economy are closely related and have a direct impact on each other. The efficiency of the system is, therefore, judged by the quantity and quality of the product at the given cost. Efficiency can be considered, as to (1) whether the out-turn of graduates and postgraduates of university education is upto the mark both in terms of quantity (number passed) and quality (level of academic achievement), or (2) whether the graduates and postgraduates are equipped with skills and capabilities required by the existing economy, or whether there is a mismatch between the training imparted and the skills needed. This can be assessed by examining extent to which graduates and post-graduates are absorbed in the job market (*Higher Education in India*, pp.89-90). The present position of higher education in regard to efficiency and quality reveal the level of wastage and the number of failures at the first-degree stage or passes in third division. This adds to the number of educated unemployed. This is a major issue, which must be tackled. The quantitative expansion of higher education in the state has been unplanned and unbalanced. The expansion has taken place not by choice but by compulsion. Some times it has been in order to satisfy social and political demands. While the system has expanded in terms of institutions and enrollments, there has been no change in the basic infrastructure facilities for meeting the educational needs of the growing number of students. One of the obvious implications of this numerical growth, without qualitative improvement, is that students do not get the education desirable, related to the demand. The colleges do not have adequate space, classrooms, and playgrounds, libraries and laboratories. Inadequate infrastructure facilities contribute to low academic standards in the affiliated colleges, where more than 80 per cent of the enrollment is concentrated. The problem is particularly acute in urban areas where, due to political and social pressures, colleges have to enroll students beyond the allotted number of seats, strength, or unqualified or, below average students. Overcrowding in the affiliated colleges has almost made it impossible to produce quality pass-outs or to introduce any change or innovation. Even the condition of the professional colleges is not very healthy, where admissions are also made after charging heavy fees in the form of endowment funds. In these cases the merit and capabilities of the candidates are generally ignored. In such circumstances, retention of the quality and standards of education is impossible. This state of affairs demands serious attention.

Support for Research

Research, the highest academic endeavor, is either compulsory, or an optional subject, directed by different departments of different universities, especially in post-graduate courses. Obviously, research at this level cannot be expected to have a high standard of quality and the findings might not be accepted as valid to be considered for any policy or plan. M.Phil research is in partial fulfillment of degree requirements and in many cases, it can be extended to Ph.D Most research work at a higher educational level does not seem to be thematic; it is fragmentary and lacks precision of thought and technique, as reported by the Education Reforms Commission Punjab, 1985. The report did not underestimate the scope of fundamental research in education, but suggested that, to solve current educational problems, applied research, including action research, is equally important. Research must not be restricted merely to universities departments, but has to flow to other institutions too, and should be linked with the policy and planning strategies of the state.

TEACHERS' TRAINING AND TEACHING

The State Council of Education Research and Training, Punjab, has laid the main stress on pre-service and in-service teachers' training. For giving in-service training to the already working secondary teachers, 12 In-service Training Centres have been functioning at District headquarters in the state. In addition, the State Institute of Science Education imparts in-service training to science and mathematics teachers. To impart training in the latest advances in educational technology, SCERT organizes seminars for teachers through the educational technology cell. The main objectives of these institutions are to: (1) bring about qualitative improvement in the existing educational system of the state; (2) provide pre- and In-service education for teachers and educational supervisors; (3) monitor and develop educational programmes; (4) introduce and implement new education policies of the Central and State Governments. Education Reforms Commission, Punjab, 1985, had also given importance to pre-service or entering-service training programmes. It maintains that existing training programmes have no relevance to the present-day teaching and learning situation. A sense of professionalism is often lacking among teachers and no attempts are being made to arouse it. Institutions imparting teacher-education have superficial links with the existing system of education, whether in schools or in universities, therefore, the dominant thrust areas of teacher-education should be value-oriented education to strike a balance between the concomitants of advances in science and technology and humanistic values. As for vocationalization of education, teachers should be sensitized to acquire skills to link educational activity with work and employment, so as to create an urge for continuing professional education. In the current technological environment, there should be a special training programme package in the pre- and in-service training programmes. Teachers' training institutes should have their own practising schools. Information technology needs to be introduced in the course of the training programmes. To raise the quality and standards of education among pupils, it is absolutely essential to produce better-quality teachers and this can be done by providing better quality of training programmes. The state has no training programmes for teachers. It is necessary to initiate pre-service and in-service (condensed courses) training programmes for teachers, teaching in colleges and universities. The quality of teachers needs to be evaluated in terms of academic achievement, professional training, and the desirable attitude towards teaching as a profession. The present observations on Punjab's teachers highlight the lack of a system of ensuring accountability of the teachers in terms of the quality of their teaching work. There is no system of evaluation of the teacher's output with regard to teaching, research, innovation, and regularity at higher levels; hence, there is urgent need for the department of education to consider these issues seriously.

COURSES AND EXAMINATIONS

Examination is an integral part of the total educational process, as it has linkages both with teaching and learning. The examination component of the educational system has two broad objectives, namely, (a) to serve as a feed-back mechanism with regard to the effectiveness of the teaching-learning process, and (b) to classify the students at the end of a pre-determined period for purposes of class-promotion. In the present circumstances, examinations are being held mostly for the classification or promotion of students. The assessment is the basis of evaluating the performance of the students in a public examination, generally held annually. This system of examinations is almost identical in Punjab. The annual examination is the base for promoting students from one

class to another. In 1981, the UGC brought out a monograph on education reforms, which iterated the deficiencies, as a number of committees and commissions had earlier pointed out. On the basis of the recommendations of the committees and commissions, efforts have been made to remove the glaring shortcomings of the examination system. Basically, the whole system in the state has become examination-ridden. Mass copying (somewhere and sometime) is also prevalent at graduate and post-graduate levels. Some universities have introduced a semester system to reduce the burden of examinations on the students, but this effort has not produced significant results. Internal assessment, introduced in order to make evaluation of education an integral part of the teaching-learning process, has not produced much positive result. There is very low correlation between marks obtained by students in internal assessment and in external examination. Even the report of the Education Reforms Commission, Punjab, 1985, has maintained that the existing method of holding examinations in the state is not satisfactory. The use of unfair practices is on the rise. Teachers are not voluntarily coming forward to share responsibility because of various reasons. Hence the credibility of the existing examination system is fast disappearing. The report has suggested measures and approaches for overcoming the shortcomings of the examination system. Some of them are as under:

- The examination work should be made a part of the total responsibility of teacher.
- The heads of institutions should provide a list of teachers for performing these duties and each and every teacher should get his/her turn by rotation.
- A mechanism to co-ordinate and supervise the work of evaluation must be developed. To make the examination system clean, a code of ethics for the evaluation of the pupils must be evolved by the teachers themselves.

In the context of the situation in Punjab, there is no need for internal assessment; hence annual and terminal examinations alone (semester system) need to be conducted for students' evaluation. As annual examination promotes the students to the next class and terminal examinations evaluate the memory, time sense, and reproducing ability of the students, these systems might remove anxiety, nervousness and fear of examinations among students.

INSTITUTIONAL AND DISTANCE EDUCATION (OPEN LEARNING SYSTEM)

With the advancement of science and technology, the concept of imparting higher education has undergone a tremendous change. The conventional concept has given way to that of distance education. The new approaches to teaching and learning combine together correspondence with different communication media, such as television, audio-video recorder, computer and even satellite, etc. The system aims at extending facilities of education to all individuals regardless of 'who and where'. During the last decade, distance education has spread (correspondence courses and Indira Gandhi Open University system) throughout Punjab. The Open University system is an outgrowth of the development and wider acceptance of the concept of distance education. This includes use of non-print media as supplementary material, such as television, computer and satellite. Although Punjab has no open university, the Indira Gandhi Open University provides opportunities for higher education even here. Moreover, Punjab Technical University, Jalandhar, provides a franchise system of education for those, who are not enrolled in conventional institutions. The other universities, such as Punjabi University, Patiala, Guru Nanak Dev University, Amritsar,

and also Punjab University, Chandigarh, provide facilities through correspondence courses with print material and contact courses, mainly in Arts and literature subjects. In fact, the Directorate of Correspondence Courses and the Open University system have made significant progress in imparting higher education. Despite all efforts, this system of education mostly reaches the economically well-off upper class families, because of high fees. If the system of distance education has to develop into a viable and effective alternative to make education reach the most deprived and most needy population, then it has to provide education at nominal charges and introduce such subjects as are available in the conventional system of education.

FINANCIAL INPUTS, MONITORING AND CO-ORDINATION

In regard to the financial position, there is some difference in allocation of funds to government and non-government colleges. Statistics in previous tables revealed that the quantitative growth in higher education is noteworthy, but the flow of financial resources into the system of education is slow, insufficient and unevenly distributed. Financial resources are divided into two parts: (i) General Education and (ii) Technical and Professional Education.

Table 42
Resources Allocation in Education in Punjab during Plan Periods (in lakh)

Plan Periods	Plans after reorganized Punjab	General Education	Technical Education
1969-74	4 th Plan	2100-00	85-00
1975-79	5 th Plan	4237-00	125-25
1980-85	6 th Plan	5300-00	300-00
1985-90	7 th Plan	7637-00	2504-00
1992-97	8 th Plan	21678-00	19600-00
1998-2003	9 th Plan	41310-49	26202-50

Source: Prepared from different Plans and also recorded from department of higher and technical education.

Figures in Table 42 indicate a regular increase in the allocation of funds from the Fourth Plan to the Ninth Plan. The successive five-year plans indicate that the allocation of funds has increased in technical and professional education but general education has relatively suffered. The financial resources, though considerably increased in absolute terms, have been found grossly inadequate for imparting higher education to the major portion of the population. Inadequacy of funds has also affected adversely the qualitative development of education. As the number of institutions of higher education in the state has increased considerably and enrollment of students too, expenditure on higher education needs to be increased accordingly, as Table 43 shows.

Table 43
Plan and Non-Plan Budget for Higher Education in Punjab (in lakh)

Year	Plan			Non-Plan			Total		
	A.E.	R.E.	Exp.	A.E.	R.E.	Exp.	A.E.	R.E.	Exp.
1997-98	371.7	162.24	115.91	13128.7	15055.5	13684.75	13500.4	15217.7	13800.66
1998-99	428.7	333.51	205.49	15664.32	17751.84	16533.07	16093.02	18085.4	16738.56
1999-2000	473.2	393.7	59.2	14932.98	21866.08	21396.5	15406.18	22259.8	21455.7
2000-01	490.7	251	117.46	19516.72	21323.62	21851.24	20007.42	21574.6	21968.7
2001-02	246.2	237.51	67.17	19934.91	22392.54	-	20181.11	22630.1	-
2002-03	535.2	-	-	19872.77	-	-	20407.97	-	-

Source: Department of Higher Education Punjab, Chandigarh, April, 2002 (Unpublished)

Note: A.E.: Approved Estimates, R.E.: Revised Estimates, Exp.: Expenditure

The general trend of resource allocation shows that a major part of the expenditure is on salaries of teachers. The proportion of expenditure on staff salaries has been continuously rising over successive decades in Punjab. This leaves little for expenditure on enhancing the quality of education. This has an adverse effect on developmental objectives.

Besides funds allocated by the state government, there are several other bodies, apart from individuals and business undertakings, which contribute directly or indirectly to the expenditure incurred by educational institutions. These include the Central Government, University Grants Commission, universities, etc. The trend of expenditure by such institutions, however, cannot be projected for future years. The proportionate distribution of expenditure on teachers and other staff salaries, recurring and non-recurring expenses is shown in Table 44.

Table 44
Distribution of Expenditure on Salaries and other Management (Percent)

Years	College/University						
	Recurring Salaries			Other	Total	Non-Recurring	
	Teaching	Non-Teaching	Total Salaries			Non recurring	Grand Total
1980-81	60.62	13.99	74.6	-			
1991-92	57.3	15.1	72.4	22.6	95.0	5.0	100.00
2001-02	55.0	16.0	71.0	23.0	94.0	6.0	100.00
	Professional Institutions						
1980-81	44.70	20.73	65.43	-	-	-	100.00
1991-92	42.0	24.0	66.0	26.0	92.0	8.0	100.00
2001-02	40.0	26.0	66.0	26.0	92.0	8.0	100.00

Source: Education Reforms Commission Punjab, 1985, section III, P. 148.

The report of the Education Reforms Commission, Punjab, 1985, clarified that in absolute terms both teachers' salaries and total per student expenditure would rise steadily over the years. However, no separate estimates have been made for college and university education, even though the cost of education is known to be markedly different for arts and science students and those undergoing professional courses, such as medicine, engineering, business administration, agriculture and computer science. The report pointed out that the proportion of students going in for advanced courses have risen from 5.3 per cent of the population in the 18-23 years age group in 1981-82, to 6.7 per cent in 1991-92, and 8.2 per cent by 2001-02. In the absence of per-student cost data for all these disciplines, averages were arrived at to represent the cost for students above the plus 2 level, in two categories: those studying general courses in colleges and universities and those in professional institutions studying medicine, engineering and the like. This exercise, broadly indicates the large amount of money that would be required to impart education to students at higher levels in the next two decade, without specifying the breakup of students under various disciplines.

Besides the above, expenditure per pupil at the higher level of education has apparently increased. Although per-student cost is not available, there are estimates that indicate that expenditure per pupil at higher professional levels is two to three times higher than at higher general-education level. A good explanation for such a difference in favour of

professional education as against general education in allocation of funds has been given by Varghese (*Resources for Higher Education in India, 1987*). There is a positive correlation between the socio-economic background of the students and the level of educational achievement. Professional and technical courses normally attract students from urban affluent families. This is perhaps true not only for Punjab, but for other states also. Dhar (*Education and Employment in India, 1976*) pointed out that sons and daughters of well-off parents study in such fields as medicine and engineering, which command higher salaries, and are characterized by very low unemployment rates. Youths from lower social economic groups attend arts, science and commerce colleges. The policy of admissions also tends to help in maintaining such a discriminatory system. Generally, admissions to professional courses are made on the basis of competitive tests, which tend to help students from well-to-do families, mostly from urban areas. Sharma (*Professionals in the Making; Their Social Origins, 1976*) reached the conclusion that the urban background and public school education with high proficiency in English, rather than proficiency in the subject, help in securing good marks in competitive tests. This means obviously that competitive examinations are in favour of a few rich families, ignoring the interests of the poor masses. This relates to the cost of education, which has increased significantly in terms of current prices. This situation also exists in Punjab, relatively, and needs to be given serious consideration.

ISSUES FOR FUTURE CONSIDERATIONS (HIGHER EDUCATION)

Besides the above discussion, it is imperative to discuss issues, which too need serious attention.

1. It is evident that the higher education system in Punjab has expanded significantly since the reorganization of the state. The number of universities has increased from three to seven in the last three decades (1971-2000), a more than 100 per cent rise. Colleges (general and professional), which were 188 in 1971-80 increased to 287 in 2000 and are located in both rural and urban areas. The system has enrolled nearly two lakh students in various undergraduate and post-graduate courses. Women and Scheduled Castes students constitute about 60.3 per cent and 9.7 per cent of the total enrollment in institutions of higher education. Nevertheless higher education still demands specialized human resource development with improved infrastructural facilities.
2. Despite the extremely high growth rate of higher education, Punjab still lags behind, in terms of International standards' in providing opportunities of higher education to the relevant age group (17-23). The *UNESCO Statistical Yearbook 1995* indicated that a very small portion (6%) of the relevant age group of population of India was enrolled in institutions of higher education. However, Punjab has a slightly better record in this regard. A large number of students do not go beyond graduation. About 90 per cent of the total enrollment into higher education is for undergraduate courses. About nine per cent of the students are enrolled for postgraduate courses and less than one percent (0.2%) for Ph.D and M.Phil research work. The maximum numbers are in liberal arts/science courses (89.25%). Engineering and technical and professional courses attract a very small percentage (10.75%) of students. In the circumstances, there is urgent need to encourage students to shift from liberal arts/sciences to paramedical and applied sciences. This will bridge the gap between technical and professional and arts/sciences courses.

3. Autonomy and accountability are considered to be important aspects of qualitative management. Almost all the commissions on education have recommended (a) delegation of powers and duties; (b) autonomy to departments and colleges, and (c) accountability of different participants of the system. The report, *Alternative Models of Management*, by Gnanam, recommended (a) decentralization of responsibilities and authority; (b) participatory management; (c) accountability of all participants; and (d) assessment of performance. Current evidence continues to support the observations of the Govariker Committee Report (1988), on the management of universities in India. As it pointed out, the management of universities in India is of a rigid and controlling nature, leaving no scope for any invention/innovation in the teaching- learning process. The entire university system has been reduced to conduct of examinations, declaration of results and planning for new admissions. Recommendations on delegation of power, autonomy, and accountability are yet to be implemented at the university as well as college levels. The existing system of higher education in Punjab demands that autonomy must be given to universities and to certain colleges in respect to teaching methodology, curriculum development and examination improvement, under a system of monitoring and evaluation. The accountability of the institutions is essential as it checks fall in standards and malpractices.
4. Despite all encouragement from the University Grants Commission and the State Education Department, no autonomous college exists in Punjab. The scheme of autonomous colleges, suggested by the Commission and the National Policy on Education (1986) and Programme of Action of (1986), needs to be activated.
5. Maintenance of quality and standards in the institutions of higher education is the responsibility of the University Grants Commission and the State Education Departments. The University Grants Commission has suggested some norms for maintenance of minimum standards of the teaching- learning process in universities and colleges. These are: there should be 200 working days, 40 working/teaching hours per week by per teacher, and 75 per cent minimum attendance of students at tutorials along with lectures. But, in practice, universities and colleges work for not more than 100 days in a year. If an institution of higher education works for only 100 days, instead of 200 days, then the quality of the teaching-learning process is bound to suffer. Keeping this in view, it is suggested that there is need to revamp the whole system of examinations, vacations and admission pattern. Motivation will be needed for the involvement and dedication of teachers.
6. The quality of output is usually assessed in terms of (a) performance in examination and (b) placement level. This assessment might be valid, but it has no relevance to the demands of the employment market. For this, job-oriented courses might help ensure better placements. There is also need to prepare database by each institute of higher education in the state, and also in the country.
7. As far as the performance of students is concerned the rate of wastage at the undergraduate level is almost 40 per cent to 50 per cent (AIU, 1985) and 40 per cent to 60 per cent (AIU, 1996) at the post-graduate level. These percentages have been obtained from specific case studies. The performance of college and university students in Punjab is also more or less the same. This wastage could possibly be reduced by providing new opportunities for a career in research and management with better incentives.

8. The University Grants Commission has initiated various schemes for curriculum development and restructuring courses, to reorient these to the needs of the society. A study by AIU (1985) indicated that the system of higher education had become obsolete. It neither helped those who wanted to go for self-employment nor those who wanted to go for jobs of any kind. The present system in Punjab apparently is in a similar position and has not undergone any significant change. Although, one or two universities and some colleges have gone for restructuring of courses and adopting an interdisciplinary approach in the teaching-learning process, this is not sufficient, hence a fundamentally fresh approach is needed.
9. Although the participation of women in higher education has increased in relative numbers, they continue to participate only in such traditional courses as arts, humanities and education. Maximum participation of women candidates (45.6% to 60.3%) in total enrollment has been seen during the last three decades, but their participation in technical and professional courses is comparatively extremely low. The participation of SC candidates in institutions of higher education has increased relatively. They constituted 9.7 per cent of the total enrollment in higher education, which has increased marginally (8.1% to 9.7%), within the last three decades. For greater participation of women and Schedule Castes students in job-oriented science subjects, there is need to change the attitude of families concerned and society, as a whole.
10. Distance (open university) education is imparted through correspondence courses with the following objectives: (a) providing efficient qualitative education through less expensive methods, (b) meeting the increasing demand for higher education, and (c) providing education to all those who cannot reach the conventional university teaching for various reasons. This method of teaching/learning is quite acceptable but, in practice, it only reaches economically well-off families. The University Grants Commission too encourages correspondence courses and open university system in the states. Presently, the system suffers from some deficiencies: (a) low quality of education; (b) covering only arts and social sciences in higher education; (c) repetition of courses already available in the conventional universities, and (d) lack of use of new technologies of education, etc. These universities should take serious steps to remove these deficiencies. Revamping the curriculum is necessary to make it more practical and job-oriented and better facilities are required for the contact programme and libraries. There is scope of opening up access to new disciplines of practical need of the students.
11. The share of higher education in the public current expenditure in India is 14.7 per cent, which is much lower than that of some of the developed countries (*UNESCO Statistical Year Book, 1995*). Hardly one per cent of the GNP is spent on research and development in science and technology. Expenditure on research and development and higher education ultimately determines the level of future development of the country. Punjab, being a developed state, financing higher education is an important issue and the question is who should be responsible -- the State, or the Centre, or the beneficiaries, or everyone? The World Bank's view is that higher education in India is subsidized for children of well-to-do families. A similar situation exists in Punjab. The beneficiaries have the capacity to pay, therefore, they should pay. A similar view has been taken in a White Paper prepared by the Ministry of Finance, Government of India. It treats higher education as a non-merit good and maintains that as the substantial benefit of education goes to individuals, it should be treated as private good, for which students should pay. Financial assistance is essential for research-

- oriented courses. Earn while learn schemes may help generate more participation in the existing system of education.
12. The methods of teaching are weighted in the direction of memorizing of texts for merely getting degrees, which are meant for getting employment or better marriage prospects. Now the time has come, when degrees awarded should be linked with employment, or self-employment opportunities. The system needs revamping, hence a broad-based overall approach is needed for the evaluation of students.
 13. Planning for general and professional education (especially technical education) should be aimed at achieving self-reliant growth and upgradation of domestic technological capabilities. To strengthen Punjab's scientific and technological capabilities, it is necessary to initiate research and development in different related areas. Although technical and vocational Institutions from ITIs and polytechnics to post-graduate level courses cover science and technology disciplines, there is need for an IIT as an apex body in Punjab, which should have linkages with technical courses in different higher education institutions located in the state.
 14. There is serious unemployment among engineers and technicians in the state, because of mismatch between qualifications of students coming out of these institutions and the demand of the industry. There is also the factor of sick units, or the failure of the industrial units at various focal points in the state. Hence there is urgent need to establish and develop industrial units in the state. With the anticipated industrial growth and economic development in the next two decades, there will be scope for the absorption of many qualified engineers and technicians. At present, many highly qualified engineers and technologists migrate abroad or to metropolitan cities in search of better employment opportunities. Establishment and development of industrial units in the state might check out-migration of qualified and skilled manpower, and also in-migration of unskilled, unqualified people. Modification in industrial policy is needed to check brain drain.
 15. Technical education institutions by and large function independently. Linkages between technical institutions and users' agencies are not sufficiently strong. Taking into account the current situation and the likely needs of successive years, more concerted efforts need to be made to enable technical education play its desired role in meeting the needs of industry. Taking into account the state's development and socio-economic perspectives, there is need to reorganize the technical education system, through induction of improved technologies' aimed at providing adequate technical and managerial manpower to the service sector as well as the unorganized sector.
 16. There is need for development in other areas, such as micro-electronics, informatics, telemetric, bio-technologies, engineering design, material sciences, instrumentation and space technology. A well concerted and co-ordinated approach to the introduction of emerging technologies in innovative industries might further accelerate the development and socio-economic growth of the state.
 17. Political will is needed if technical education is to address itself to these multiple and challenging tasks. As scientific and technological advances are very rapid and unpredictable, a viable approach to technical education must encourage development of motivation and skills for continuing and independent learning. Hence, there is need to reshape, restructure and reorganize the technical education system for producing high quality engineers and technologists, so that

they may contribute to the development of the state and meet the challenges of the future.

18. Due to social and political pressures, the higher education system in Punjab has expanded faster in the last two decades in terms of institutions, enrollment and manpower. Higher education is today apparently open to all, irrespective of merit or capabilities. Its rapid expansion is due to a higher pressure on enrollment in colleges and universities without proportionate expansion of essential infrastructure facilities. This has adversely affected quality and standards. A large majority of such colleges are located in urban areas, providing educational facilities to urban students; therefore, the rural pupils have limited scope for higher education. This deprives them of opportunities to compete with urban pupils, both in further educational avenues and in the job market. A rational approach is needed for opening new colleges and also attention to proper infrastructure, numbers of candidates and the viability of the courses.
19. Private affiliated colleges receive government aid to the extent of 95 per cent of their recurring expenditure based on their staff strength (according to the Directorate of Education). This aid has now become inadequate in view of the increase in the administrative and teaching staff of these colleges. The grants, more often than otherwise, are not available in time, which cause considerable hardship to the institutions and their staff. This system needs to be reviewed. The Education Reforms Commission, Punjab, 1985, pointed out that the state has a well-founded system of university education. The prime objective of the university is to engage itself in the pursuit of creating new knowledge. The need of the economy and all development processes is for persons skilled in the art of utilizing the already discovered knowledge for the benefit of society. An analysis of the manpower needs of any organized socio-economic system would reveal that, for its successful functioning, it requires 80 per cent of its personnel trained in skills for utilizing the existing knowledge and only 20 per cent of those for generating new knowledge. While our universities are geared to train only the latter category, our tertiary system has no provision for training the former, which constitutes the bulk of the manpower needs of the economy. Until the gap is filled, or facilities for doing so are fully developed, education at this level will remain unbalanced. This mismatch between needs of, and achievements in manpower development is responsible for educated unemployment and pressure on universities, leading to a fall in standards of education.
20. Government should encourage private enterprises and avoid creating a system based on affiliation of institutions with central agencies. It is also suggested that the government may follow the Bits-Pilani pattern (practical school, where practical training has been given more importance) for technical education in Punjab.

SUMMING UP (HIGHER EDUCATION)

Most of the relevant issues concerning higher education were first discussed by the Universities Education Commission (1948-49) and then by the Education Commission (1964-66). Both expressed grave concern about the deteriorating quality of higher education. The National Policy on Education (1968) too proposed various measures for the improvement of higher education. It has suggested the need for effective measures for all-round improvement and emphasized consolidation and expansion of facilities in existing institutions. It has also expressed concern about deteriorating academic

standards in affiliated colleges. This system does not provide autonomy to deserving colleges to frame curricula, courses of studies, or develop their own system of evaluation. It has clearly stated that courses and programmes should be redesigned to meet the demands of specialization. The scheme of re-designing courses has been introduced by UGC to re-model the conventional three subjects' course of the first-degree level. The National Policy (1986) suggested that teachers' performance should be systematically assessed and also proposed provision of enhanced support to research and steps to ensure its high quality. It also envisaged the establishment of a National Apex Body covering general and professional education for greater co-ordination and consistency of policy, sharing facilities and developing inter-disciplinary research. The UGC has given high priority to the implementation of NPE (1986). Presently, in Punjab, the responsibility for the development of professional and technical higher education is shared by the Department of Education and a number of other agencies. There are separate structures for higher education in engineering, medicine and agriculture. Separation of decision making and funding mechanism has become more of a problem, because various disciplines are emerging, and courses of study have to be developed, keeping in view the need for developing compatible inter-faces with other related disciplines. In order to remedy this problem, there is need to establish a state apex body for higher education, undertake integrated planning and reinforce programmes of post-graduate education and interdisciplinary research. NPE (1986) also has specific proposals for improving overall improvement of the efficiency of the universities. Effective measures will have to be taken for improving the working conditions of teachers and the quality of teaching. A comprehensive, open, participatory and data-based system of teacher-evaluation needs to be established. It should take into account the work of teachers in research and innovation, regularity and attention to teaching and extension, and social service activities.

Many good schemes suggested by the different Commissions (1948-49 and 1964-66), and Policies (1968 and 1986) have not provided expected results because of inadequate strategies for implementation, lack of financial resources, or lack of political will. Some of the programmes were not implemented and some failed because of scarcity of funds. A firm determination and a strong political will are the essential instruments, which can pave the path to success. If the Government of Punjab has desirable intentions and is willing to bring about qualitative improvement in higher education, then the suggested measures might be helpful in shaping and reshaping the existing educational system of higher education.

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Chapter 12

LABOUR AND EMPLOYMENT

INTRODUCTION

No doubt Punjab has made tremendous progress since independence and has been a leading state in per capita income and food production in the country. However, of late, the state has witnessed a low rate of growth as compared to some major states and the country as a whole, which has serious implications, especially for the expansion of higher employment opportunities. One of the serious problems Punjab is confronted with at present is the high level of unemployment. Disguised unemployment in the agricultural sector and the large volume of low-quality, existing employment, are causes of concern. Particularly, unemployment among the educated youth is serious in the state. The growth of employment has not been commensurate with that of the state domestic product, resulting in underutilization of the labourforce. An important objective of development planning has been to provide for increasing employment opportunities not only to meet the backlog of the unemployed but also the new entrants to the labourforce. One of the important monitorable targets for the Tenth Five Year Plan at the national level, that has rightly been given prominence, is providing gainful high-quality employment to the labourforce (Ministry of Finance 2001). Similarly, the major thrust area, as a strategy in the Tenth Five Year plan of Punjab, is the generation of additional employment opportunities in the private sector by promoting investment and improving marketable vocational skills with widespread use of information technology. However, the process of globalization and privatization has serious implications for further generation of employment opportunities in the organized sector, especially the public sector, where the disinvestment process is on and the emphasis is on resource efficiency. The higher use of capital-intensive technology in the wake of the new economic order has serious implications for generating employment opportunities. This points to further deterioration of the employment situation in the short run, if not in the long run and hence, appropriate policy interventions are required at various level, in order to improve the employment situation in the state.

This section of the chapter seeks to examine the dimensions of the employment and unemployment situation in the state, status and quality of employment, sector-level changes in employment especially farm and non-farm employment, employment in the organized sector, role of special employment generating schemes/programmes and status of skilled and trained manpower. The trends and structure of employment and unemployment have been analysed at the area, gender, age, and education levels over specific periods, for which relevant information is available. Appropriate policy recommendations have been made, after a detailed study of the various aspects of the employment and unemployment situation in the state and related issues.

DIMENSIONS OF EMPLOYMENT AND UNEMPLOYMENT

Measurement Criteria

Analysis of the measurement, trends and structure of employment and unemployment in Punjab is mainly based on quinquennial surveys carried out by the National Sample Survey Organization (NSSO). Different approaches have been used to determine the activity status of persons during specific reference periods, namely one year, one week

and each day of the reference week. Based on these periods, three different measures of activity status, such as usual status, weekly status and daily status, have been arrived at as follows.

Usual Status

Usual principal status: A person is considered in the labourforce on Usual Principal Status (UPS) if he/she has spent relatively longer time (i.e., major time criterion) on economic activity during 365 days preceding the date of survey. Persons classified as not belonging to the labourforce are assigned the broad activity status of 'neither working nor available for work'. The activity status of persons, who belong to the labourforce, of working or not 'working but seeking and/or available for work', is ascertained on the basis of major time criterion. UPS unemployment rate is the proportion of those classified as unemployed on this basis expressed as a percentage of those classified as being in the labourforce. On this criterion, a person can be counted as unemployed even though he/she may have been employed for part of the year.

Usual principal and subsidiary status: A person, whose principal usual status has been determined on the basis of major time-criterion, could have pursued some economic activity for a relatively short time during the reference period of 365 days preceding the date of survey. The status in which such economic activity was pursued is termed the subsidiary status of that person. This is a more inclusive measure which covers, in addition, participation in economic activity on a more or less regular basis, of those classified as unemployed on the UPS as well as those as being outside the labourforce on the same criterion. This criterion is termed as Usual Principal and Subsidiary Status (UPSS). This would result in a higher proportion of the population as being in the labourforce with a higher proportion of workers and lower unemployment rates relative to the UPS criterion.

Current Weekly Status

The Current Weekly Status (CWS) of a person is the activity status pursued during a reference period of seven days preceding the date of survey. According to this criterion, a person is counted as employed if he/she was engaged in economic activity for at least one hour on any day during the reference week. A person who is not working even for one hour on any day but found seeking/available for work during the reference week is classified as unemployed. A person who had neither worked nor was available for work anytime during the reference week is considered as engaged in non-economic activity (or not in the labourforce). To the extent that employment varies seasonally over the year, the labourforce participation rates (LFPR) on the current weekly status would tend to be lower. However, CWS unemployment rates would tend to be higher when we consider unemployment during the current week of those classified as being employed in the UPS (or UPSS) criterion. The difference between unemployment rates on current weekly and that on usual status would provide one measure of seasonal unemployment.

Current Daily Status

The activity pattern of population, particularly in the unorganized sector, is such that during a week and sometimes even during a day, a person could pursue more than one activity. Based on the time disposition of a person on each day of the reference week, person-days employment/unemployment are aggregated to generate estimates of

person-days in employment/unemployment. On Current Daily Status (CDS) criterion, a person was considered working for the entire day if he/she had worked for four hours or more during the day. If the person had worked for one hour or more but less than four hours, he/she was considered employed for half-day and seeking or available for work (unemployed), or neither seeking nor available for work (not in the labourforce) for the other half of the day. The person-days unemployment rate is derived as the rate of person-days in unemployment to the person-days in the labourforce. This measure emphasizes the unemployment of those employed on a weekly status. This measure of unemployment fully captures open unemployment. However, the analysis of data has been done by and large on the basis of UPSS approach, supported by other measures wherever necessary.

Labour Force Participation Rates (LFPRs) in Punjab

According to usual status, CWS and CDS criteria, labourforce participation rates for rural as well as urban males has declined by one per cent during the six years from 1993-94 to 1999-2000 (Table 1). On the other hand, LFPR for rural females has remained almost the same over this period according to the UPS criterion, whereas it has increased from about 22 per cent to 28 per cent according to UPSS. This indicates that a higher proportion of females in rural areas are subsidiary workers. LFPRs are higher for urban males than rural males in the state, for whom these show a declining trend since 1987-88. These rates for urban males show an increase from 1987-88 to 1993-94 and afterwards a decline in 1999-00. This LFPRs suggests that more people are joining school and also that there is a reduction in the growth of population.

Table 1
Labourforce Participation Rates in Punjab

Usual Principal Status	1987-88	1993-94	1999-00
Rural Male	55.3	55.0	53.9
Rural Female	8.1	4.0	4.3
Urban Male	56.0	57.0	55.9
Urban Female	6.8	6.3	7.5
Usual Principal & Subsidiary Status			
Rural Male	57.1	55.4	54.3
Rural Female	32.1	22.3	28.2
Urban Male	56.5	57.1	56.5
Urban Female	13.3	9.9	12.8
Current Weekly Status			
Rural Male	55.1	55.1	54.0
Rural Female	8.3	20.2	27.4
Urban Male	56.1	57.0	55.9
Urban Female	7.9	9.7	11.1
Current Daily Status			
Rural Male	55.0	54.8	53.2
Rural Female	7.6	12.0	15.8
Urban Male	55.8	56.8	55.5
Urban Female	7.4	7.9	9.0

Source: NSSO 1990, 1997, 2001.

Worker-Population Ratios (WPRs) in Punjab

WPR is an important indicator of development showing the proportion of working population in an economy. Table 2 indicates that WPR in Punjab, based on UPS criterion for rural males and urban males, was 52.6 per cent and 54.1 per cent respectively in 1999-2000. On the other hand, WPR based on UPSS was 53 per cent for rural males and 57.7 per cent for urban males over the same period. The female WPR in the state during 1999-2000 was four per cent on UPS and 28 per cent on UPSS criterion in rural areas. This indicates that a large proportion of women work in a subsidiary capacity in rural areas. The female WPRs based on CWS and CDS, which are comparatively higher, support this conclusion.

A glance at Table 2 shows that there has been a declining trend of WPR based on UPSS since 1983 for rural as well as urban males. For instance, WPR for rural males has steadily declined from 67 per cent in 1983 to 53 per cent in 1999-2000 and for urban from 62.4 per cent to 54.9 per cent over the same period. However, WPR for rural females, which declined from 36.5 per cent in 1983 to 22 per cent in 1993-94, has increased to 28 per cent in 1999-2000. A similar trend is witnessed for women workforce in urban areas. WPR in urban areas is comparatively higher than in rural areas by usual status approach.

Table 2
Worker-population Ratio in Punjab

	1983	1987-88	1993-94	1999-00
Usual Principal Status				
Rural Male	63.4	53.7	54.2	52.6
Rural Female	4.7	7.5	3.7	4.0
Urban Male	61.5	53.2	55.1	54.1
Urban Female	8.46	5.8	5.8	7.3
Usual Principal and Subsidiary Status				
Rural Male	67.0	56.0	54.6	53.0
Rural Female	36.5	31.7	22.0	28.0
Urban Male	62.4	54.0	55.3	54.9
Urban Female	14.9	12.3	9.3	12.5
Current Weekly Status				
Rural Male	62.3	53.1	54.1	52.3
Rural female	10.2	7.9	19.9	27.9
Urban Male	61.2	53.1	55.0	53.7
Urban Female	10.3	7.0	11.7	15.5
Current Daily Status				
Rural Male	59.1	52.9	53.3	51.0
Rural Female	7.1	7.1	11.7	15.5
Urban Male	59.1	52.0	54.6	52.9
Urban Female	9.5	6.5	7.5	8.5

Source: NSSO 1987, 1990, 1997, 2001.

Age-specific Worker-population Ratio (ASWPR)

The number of persons usually working in a particular age group per 1,000 persons in that age group is defined as the age-specific worker population ratio. Table 3 gives the ASWPR for Punjab for all workers based on UPSS criterion for 1999-2000. Comparable

estimates are given in the second row of each group for 1993-94. It can be observed that ASWPR among rural males declined in the younger age groups as well as in those aged 50 years and above, during 1999-2000 as compared to 1993-94. It has remained almost the same for age groups of 25 to 49 years. However, ASWPR among rural females has increased over this period. This is mainly because of an increase in subsidiary workers. A similar trend is witnessed in younger age groups, both males and females, in the urban areas over this period

Work Participation Rate at the District Level

Table 4 clearly shows that the total work participation rate has increased in all the districts of the state during 1991-2001, the highest WPR being in Nawanshahr district and the lowest in Gurdaspur district. Total WPR for the state as a whole has increased from 30.9 per cent in 1991 to 37.6 per cent in 2001. However, a look at the gender-level WPR indicates that female WPR has substantially increased during this period from 4.4 per cent to 18.7 per cent, whereas the male WPR has remained almost the same at 54 per cent. Table 4 shows that female WPR has increased in all the districts of the state, whereas male WPR has increased in some districts, decreased in some others and remained the same in the rest. This can partly be attributed to the level of changes in the growth of different sectors in various districts. Increase in female WPR is encouraging. However, there has been a significant increase in the proportion of female marginal workers during the decade. Among Indian States and Union Territories, Punjab ranked 24th, 14th, and 26th respectively during 2001 in terms of the total, male and female work participation rates. Generally, WPR is higher in those districts, which are agriculturally dominated.

Table 3
Age-specific Usual Worker (UPSS) Population Ratio in Punjab

Age group (in years)	Rural Male	Rural Female	Rural Persons	Urban Male	Urban Female	Urban Persons
0-4	--	--	--	--	--	--
	--	--	--	--	--	--
5-9	5	3	5	14	22	18
	--	--	--	--	--	--
10-14	68	42	55	45	23	35
	75	29	53	55	12	34
15-19	447	258	359	354	125	245
	566	205	405	469	56	294
20-24	849	377	605	724	122	433
	913	259	592	802	99	450
25-29	949	421	681	937	154	642
	970	325	637	977	101	567
30-34	972	460	711	980	194	575
	967	376	672	969	189	589
35-39	990	560	771	980	226	611
	988	482	737	980	185	606
40-44	978	622	809	980	244	649
	972	531	749	997	263	657
45-49	985	614	819	984	258	642

Age group (in years)	Rural Male	Rural Female	Rural Persons	Urban Male	Urban Female	Urban Persons
	974	435	724	961	216	635
50-54	919	490	729	923	305	673
	958	375	691	928	190	571
55-59	877	431	639	862	204	507
	940	359	635	896	169	522
60 & above*	589	211	405	466	57	260
	792	259	545	659	76	379
All	530	280	410	549	125	353
	546	220	392	553	93	336
All India	531	299	--	518	117	--
	553	328	--	521	121	--

Source: NSSO 1997, 2001.

Note: Figures in the second row in each age group refer to 1993- 94.

* In the age group 60 and above; the figures for 1993-94 belong to the age group of 60-64 years.

Table 4
Work Participation Rate at the District Level in Punjab, 1991 and 2001

State/Districts	Work Participation Rate					
	Total		Male		Female	
	2001	1991	2001	1991	2001	1991
Nawanshahr	44.9	29.8	55.6	53.0	33.0	4.0
Faridkot	42.4	32.8	59.5	55.7	23.0	6.8
Bathinda	42.2	32.8	55.4	55.5	27.0	7.1
Mansa	40.7	34.3	54.4	57.6	25.1	7.5
Sangrur	40.6	32.3	54.9	56.3	24.1	4.7
Moga	40.1	31.4	54.3	55.1	24.2	4.5
Muktsar	39.7	33.5	55.2	56.8	22.3	7.1
Rupnagar	39.3	30.1	52.8	52.2	23.8	4.6
Fatehgarh Sahib	38.2	30.2	55.1	54.7	18.3	2.1
Ludhiana	37.8	31.3	55.9	55.5	15.7	2.6
Patiala	37.2	30.2	54.1	53.2	17.6	4.1
Ferozepur	37.1	32.3	53.6	54.5	18.5	7.4
Amritsar	36.0	30.7	53.2	55.0	16.3	2.7
Kapurthala	35.0	31.2	53.4	54.0	14.1	5.8
Hoshiarpur	34.7	28.6	51.0	50.6	17.3	4.7
Jalandhar	34.5	30.1	54.1	53.0	12.3	4.6
Gurdaspur	33.4	28.1	51.9	51.3	12.7	2.4
Punjab	37.6	30.9	54.1	54.2	18.7	4.4

Source: Director of Census Operations, Punjab, 2002.

Growth of Labourforce and Workforce

Table 5 shows that the rate of growth of the labourforce has been higher (2.57%) than that of the workforce (2.55%) during 1993-94/1999-2000. The growth of the female workforce has been comparatively higher than that of the labourforce. On the other hand, the growth of the male workforce has been less than that of the male labourforce during this period. When we examine the growth rates at the area level, we find that the growth rate of the labourforce in rural areas has been higher (2.07%) than that of the workforce (1.99%), whereas the growth rate of urban persons has been lower in the labourforce (3.81%) than in the workforce (3.95 per cent).

Table 5
Annual Compound Growth Rates of Population, Labourforce and Workforce, 1993-94/1999-00

	Population	Labour Force	Work Force
Rural Males	1.17	0.88	0.66
Rural Females	1.16	5.20	5.31
Rural Persons	1.17	2.07	1.99
Urban Males	3.35	3.17	3.23
Urban Females	3.11	7.60	8.32
Urban Persons	3.24	3.81	3.95
Males	1.89	1.60	1.50
Females	1.77	5.61	5.81
Persons	1.82	2.57	2.55

Source: Director of Census Operations, Punjab, 1991; NSSO 1997, 2001.

Note: Estimates of population as on 1 January 94 and 1 January 2000, which are mid-points of quinquennial surveys 1993-94 and 1999-2000, have been worked out by interpolation from population Census estimates for March 1991.

Crude labourforce participation rates and workforce participation rates (on principal and subsidiary status) have been used for rural males, rural females, urban males and urban females from NSS survey reports for 1993-94 and 1999-2000.

Changes in the Status of Employment

Employed persons have been categorized into three broad groups according to their status of employment, (i) self-employed, (ii) regular employees and (iii) casual labour. Table 6 displays per 1,000 usually employed persons by these broad categories for both principal status workers and all workers, i. e., principal and subsidiary status workers. Analysis of the status of employment relates only to all workers. Table 6 reveals that during 1999-2000, 54 per cent males and 89 per cent females in the rural areas of the state were self-employed. The corresponding proportions in urban areas were 47 per cent males and 49 per cent females. The proportion of regular employees among women (3.7%) as compared to men (17.5%) was much lower in rural and higher in urban areas, with 43 per cent women and 40 per cent men being regular employees during this period. The proportion of casual labour was relatively much higher for males than females, both in rural and urban areas of the state. However, male casual labour in rural areas at 28.5 per cent was much higher than in urban areas at 12.2 per cent.

Table 6
Per 1000 Distribution of Usually Employed by Status of Employment

Usual Principal Status	Rural Male	1987-88			1993-94				1999-00			
		Rural Female	Urban Female	Urban Female	Rural Male	Rural Female	Urban Male	Urban Female	Rural Male	Rural Female	Urban Male	Urban Female
Self-employed	593	614	510	246	543	421	485	254	583	476	468	187
Regular employees	187	133	385	667	133	184	400	644	176	230	409	712
Casual Labour	220	253	105	57	324	395	115	102	286	294	123	101
Principal & Subsidiary Status												
Self-employed	600	852	430	581	547	850	487	500	540	889	474	491
Regular Employees	180	35	440	315	132	32	398	415	175	37	404	434
Casual Labour	220	113	130	104	321	118	115	85	285	74	122	75

Source: NSSO 1990, 1997, 2001.

An examination of changes in the status of employment over the period indicates that the proportion of self-employed rural males has decreased from 54.7 per cent in 1993-94 to 54 per cent in 1999-2000, whereas that of rural females has increased from 85 per cent to 89 per cent. It is interesting to note that regular male employees in rural areas have increased by four per cent during 1993-94 through 1999-2000 and correspondingly casual male labour has declined proportionality over this period. Similarly, whereas self-employment of rural women has increased by four per cent over this period, women casual labour has correspondingly decreased by the same percentage. Changes in the status of urban employment indicates that male self-employment decreased from 48.7 per cent in 1993-94 to 47.4 per cent in 1999-2000, whereas regular employment and casual labour increased by 0.6 and 0.7 percentage points respectively. Over the same period, female self-employment and casual labour in urban areas declined by one per cent each and regular employment increased by two per cent. Recent changes in the status of employment point to the impact of post-liberalization policies.

Changes in Industrial Distribution of Workforce

Table 7 indicates the changing structure of the workforce at the broad industry level in Punjab as compared to the country as a whole. The share of the workforce engaged in agriculture in Punjab has declined from about 68 per cent in 1983 to 53 per cent in 1999-2000 as compared to about 68 per cent to 60 per cent in the country as a whole. On the other hand, the share of the secondary sector has increased in Punjab from about 13 per cent in 1983 to 18 per cent in 1999-2000 as compared to 14 to 17 per cent in the country. The workforce engaged in the service sector in the state has increased from 19.26 per cent to 27.62 per cent over the same period as compared to 17.21 per cent to 22.73 per cent in the country. Thus, it is evident that Punjab has experienced a greater shift of labourforce to non-farm sectors than in the country as a whole. This can be attributed partly to the deteriorating conditions in the agricultural sector in the state.

Table 7
Percentage Share of Estimated Workforce at the Sector Level in Punjab and India

Sector	Punjab			India		
	1983	1993-94	1999-00	1983	1993-94	1999-00
Agriculture	67.90	56.50	53.23	68.45	64.75	59.84
Mining & Quarrying	0.03	0.24	-	0.58	0.72	0.57
Primary Sector	67.93	56.74	53.23	69.03	65.47	60.41
Manufacturing	9.81	10.28	10.91	11.24	11.35	12.09
Electricity, gas, Water etc.	0.72	1.27	0.93	0.28	0.36	0.32
Construction	2.22	4.08	5.67	2.24	3.12	4.44
Secondary Sector	12.75	15.63	17.51	13.76	14.83	16.85
Trade, Hotel & Restaurants	6.17	10.45	13.54	6.35	7.42	9.40
Transport, Storage communication etc.	3.41	3.56	5.21	2.44	2.76	3.70
Finance, Insurance Services	0.91	1.07	1.25	0.56	0.94	1.27
Public Administration, Community Services,	7.88	12.54	9.26	7.86	9.38	8.36
Others	0.95					
Tertiary Sector	19.22	27.62	29.26	17.21	20.50	22.73
All (No. In Millions)	7.30	7.98	9.29	302.76	374.45	397.00

Source: NSSO 1987, 1997, 2001; Planning Commission 2001

Note: The total workers in each industry for each year have been worked out by applying the percentage distribution given by National Sample Surveys across industries to absolute numbers of four categories of workers. These categories of workers in each industry have been added to work out estimates of total workers in each industry.

Table 8 presents the distribution of usually employed workers by industry for principal and subsidiary status workers. During 1999-2000, among all usually employed workers in rural areas of Punjab, about 63 per cent males and 91 per cent females were engaged in agricultural activities. The proportion of males in the agricultural sector gradually declined from 77 per cent in 1983 to 64 per cent in 1999-2000. On the other hand, the females engaged in this sector decreased from 92 per cent in 1983 to 91 per cent in 1999-2000. Over the years, there has been a gradual increase in the proportion of males engaged in construction, trade, hotels and restaurants and transport, storage and communication services in the rural areas of the state.

Table 8
Percentage of Usually Working Persons in the UPSS by Broad Industry Category

Broad Industry Category	Rural Males				Rural Females				Urban Males				Urban Females			
	1983	1987-88	1993-94	1999-00	1983	1987-88	1993-94	1999-00	1983	1987-88	1993-94	1999-00	1983	1987-88	1993-94	1999-00
Agriculture	77.0	68.8	68.1	63.7	92.2	91.6	92.7	90.6	10.1	7.3	6.5	6.5	31.2	43.5	27.6	20.1
Mining & Quarrying	--	--	--	--	0.1	0.1	--	--	--	--	1.0	--	--	0.2	-	--
Manufacturing	6.2	9.7	6.2	7.7	4.2	2.8	1.3	2.3	27.1	29.6	26.4	24.2	22.8	16.6	10.2	13.4
Electricity, gas, Water etc.	0.7	1.1	1.5	1.1	--	--	0.2	0.2	1.8	1.5	1.7	1.3	1.2	0.7	0.8	0.7
Construction	2.9	4.0	4.7	7.8	0.1	--	--	0.1	3.8	4.5	5.6	7.4	--	0.4	1.0	1.4
Trade, Hotel & Restaurants	4.1	4.5	6.3	8.1	0.6	1.1	1.0	1.1	21.4	24.8	28.2	32.7	5.3	5.1	8.2	25.1
Transport, Storage communication etc.	3.3	3.8	3.6	5.6	0.1	0.1	--	--	9.4	8.7	6.7	9.7	0.8	1.2	0.6	2.1
Finance, Insurance Services	0.3	7.2	0.6	0.5	--	4.2	--	--	3.9	22.9	2.8	3.8	2.5	32.3	2.1	1.3
Public Administration, Community Services, etc.	5.1		9.0	5.5	2.1		4.8	5.7	20.2		21.1	14.5	33.9		49.5	35.9
All	100.00		100.00	100.00		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		100.00

Source: NSSO 1987,1990,1997,2001.

In the urban areas of the state, trade, hotels and restaurants engaged about 33 per cent of male workers, while the manufacturing and construction sectors accounted for 24 per cent and seven per cent respectively of the usually employed males during 1999-2000. Public administration, community services and transport, storage and communications provided employment to about 15 per cent and 10 per cent respectively of urban male workers. On the other hand, services accounted for the highest proportion of urban females, that is, 37 per cent followed by trade, hotels and restaurants (25%), agriculture (20%) and manufacturing (13%). The proportion of urban male workers in manufacturing declined by three per cent and in services by six per cent during 1983 to 1999-2000. Their proportion increased in construction and trade, hotels and restaurants over this period. On the other hand, the proportion of urban female workers substantially increased in trade, hotels and restaurants by 20 per cent and decreased in agriculture and manufacturing by 11 and 10 per cent respectively. It may be noted in this context that the share of the rural non-agricultural sector in the state has increased from 23 per cent in 1983 to nearly 26 per cent in 1999-00. However, according to the provisional results of Census 2001, non-agricultural workers in the rural areas of the state have substantially increased at 46.4 per cent and correspondingly, there has been a 20 per cent decrease in agricultural workers during 1991-2001 (Director of Census Operations, Punjab, 2002).

The share of rural female workers has increased from about eight per cent to nine per cent over the same period. Male workers engaged in the secondary and tertiary sectors in urban areas in 1999-2000 were 32.9 per cent and 60.7 per cent respectively. The share of women workers engaged in these are 15.5 per cent and 64.4 per cent respectively in 1999-2000.

It is interesting to note that as compared to Punjab's share of 27.4 per cent, the proportion of rural workers in the non-farm sector is the highest in Kerala (51.7%), followed by West Bengal (36.4%) Assam (32.3%), Tamil Nadu (32.1%) and Haryana (31.5%), whereas the share for the country as a whole is 23.7 per cent (NSSO 2001). Thus, it may be observed that the share of the non-agricultural sector has increased over the period in the state. However, the pace of shift from agriculture to non-agricultural activities, especially in rural areas, needs to be hastened through diversification of activities and other means necessary. However, the nature and determinants of non-farm employment need to be examined (Chand 2002). It will be interesting to note that in most of the developed countries, only a very small proportion of workers are dependent on the agricultural sector. For instance, in countries such as Canada, Britain, United States, Australia, Italy, Republic of Korea, the workforce engaged in the agricultural sector ranged between one per cent and 5.7 per cent only in 1997 (ILO 1999). Hence, speedier diversification into non-agricultural activities is the immediate requirement to generate higher employment opportunities in the state.

Growth Rates of Employment in Sectors

Table 9 shows that the manufacturing sector has registered a significant growth in employment, especially in the rural areas of the state, in the post-liberalization period. The growth rate of employment in this sector in rural areas has increased from -0.64 per cent during 1983/1993-94 to 6.83 per cent. The household industry in rural areas has registered substantial rise during 1991-2001. The construction sector has recorded a high growth of employment during this period in both rural and urban areas. Transport, storage and communications is another sector, which has witnessed very high growth of

employment. Growth rates of employment in this sector in the pre-liberalization period were 1.69 per cent in rural areas and -0.29 per cent in urban areas, whereas these are as high as 8.55 per cent and 10.52 per cent respectively in the post-liberalization period. The growth of employment in finance, insurance and real estate services suffered significantly during this period in rural areas, but made substantial gains in urban areas. The sectors, which have suffered considerably in both rural and urban areas over the period under consideration, are electricity, gas, water, etc., and public administration, community services, etc. However, the overall growth rate of employment in all the sectors taken together has increased from 0.10 per cent during 1983/1993-94 to two per cent in rural areas and from 2.70 to 3.95 per cent in urban areas during 1993-94/1999-2000.

Table 9
Growth Rate of Employment (UPSS) at the Sector Level in Punjab

Sector	1983/1993-94		1993-94/1999-00	
	Rural	Urban	Rural	Urban
Agriculture	-0.86	-1.32	1.53	3.40
Mining & Quarrying	0.32	8.22	NA	-13.83
Manufacturing	-0.64	2.17	6.83	2.87
Electricity, gas, Water etc.	9.82	1.88	-4.17	-0.88
Construction	5.75	7.27	9.57	8.30
Trade, Hotels & Restaurants	5.26	5.69	0.00	5.08
Transport, Storage communications etc.	1.69	-0.29	8.55	10.52
Finance, Insurance & real estate	8.13	-0.39	0.53	8.20
Public Administration, Community Services,	7.10	3.25	-3.21	0.38
All Sectors	0.10	2.70	2.00	3.95

Source: Chadha and Sahu 2002.

Unemployment Rates in Punjab

Table 10 shows the unemployment rates in the state according to three approaches. It may be observed that estimates of unemployed persons, based on usual status criterion, or even the more restrictive US (adjusted) measure, were very low during 1999-2000. The unemployed person-days rates were higher than those for persons, which indicate a high degree of intermittent unemployment. This shows lack of regular employment for many workers. Urban unemployment rates are relatively higher than rural ones. Unemployment rates for rural males on usual principal status as well as usual status (adjusted) have increased by about one per cent during 1993-94 through 1999-2000. On the other hand, urban unemployment for males on these measures remained almost the same during this period. Unemployment rates for urban females on UPS and US (adjusted) measures have decreased by five and three per cent respectively, whereas for rural females these have increased by one per cent point on UPS and remained almost the same on US (adjusted) measure. However, from 1983 to 1999-2000, unemployment rates for rural males had declined until 1993-94, but rose during 1999-2000. Female unemployment rates in rural areas have been on the decline on all the three measures. No definite pattern in rates for urban males as well as females was witnessed during this period.

Table 10
Area- and Sex-wise Unemployment Rates in Punjab

Rural Male	US	US (adj)	CWS	CDS
1983	3.2	-	3.9	6.9
1987-88	2.9	1.9	3.4	3.8
1993-94	1.4	1.3	1.9	2.7
1999-00	2.3	2.3	3.1	4.2
Rural Female				
1983	-	11.7	5.7	9.3
1987-88	7.4	1.6	4.8	6.6
1993-94	7.1	1.2	1.5	2.3
1999-00	6.2	0.9	1.0	1.7
Urban Male				
1983	-	3.9	4.9	7.1
1987-88	4.8	4.4	5.3	6.8
1993-94	3.3	3.1	3.4	3.9
1999-00	3.1	2.8	3.9	4.8
Urban Female				
1983	-	9.5	8.1	9.4
1987-88	14.7	6.8	11.4	12.2
1993-94	8.6	5.3	4.8	5.8
1999-00	3.5	2.1	4.3	5.3

Source: NSSO 1987,1990., 1997, 2001.

When we compare the unemployment rate of Punjab with other states of the country, we find that it is one of the lowest on CDS at 4.15 per cent in 1999-2000. Among major states, only Himachal Pradesh and Rajasthan have relatively lower unemployment rates than Punjab, except Rajasthan in 1987-88 (Table 11). Kerala has the highest unemployment rate (20.77%) followed by West Bengal (14.95%) and Tamil Nadu (12.05%). The unemployment rate in India during 1999-2000 was 7.29 per cent, relatively much higher than that of Punjab. A glance at the Table 11 indicates that unemployment rates for most of the states, except Gujarat, Haryana and Karnataka, have increased in the nineties.

Table 11
Unemployment Rates (CDS) in Major States

States/Country	Unemployment Rate		
	1987-88	1993-94	1999-2000
Andhra Pradesh	7.35	6.67	7.94
Assam	5.09	7.96	8.00
Bihar	4.04	6.25	7.35
Gujarat	5.79	5.73	4.63
Haryana	7.59	6.59	4.67
Himachal Pradesh	3.12	1.82	2.93
Karnataka	5.06	4.89	4.61
Kerala	21.19	15.50	20.77
Madhya Pradesh	2.86	3.42	4.60
Maharashtra	4.67	4.97	7.09
Orissa	6.44	7.28	7.38
Punjab	5.07	3.08	4.15
Rajasthan	5.74	1.33	3.06
Tamil Nadu	10.36	11.44	12.05
Uttar Pradesh	3.44	3.45	4.27
West Bengal	8.13	9.87	14.95
Delhi	4.77	1.91	4.58
India	6.09	6.03	7.29

Source: Planning Commission 2001a.

Unemployment Rates of the Educated

NSSO survey defines educated persons as those who have attained an educational level of secondary and above. Table 12 presents unemployment rates, on various approaches, for educated persons for the latest and the last quinquennial survey. During 1999-2000 unemployment rate among the educated in Punjab was much higher for females in both rural and urban areas, despite a substantial decline during 1993-94 to 1999-2000. The unemployment rate for educated rural males has increased by one per cent on different approaches over this period. Among urban males, the unemployment rate has declined by one per cent on different measures. A comparison with total unemployment rates indicates that those for the educated are relatively higher in the state.

Table 12
Unemployment Rates of Educated Persons of age 15 years and above

Rural Male	US	US (adj)	CWS
1993-94	3.5	3.5	4.1
1999-00	4.8	4.6	5.3
Rural Female			
1993-94	34.7	11.2	12.4
1999-00	21.5	6.2	5.5
Urban Male			
1993-94	5.8	5.4	5.8
1999-00	4.7	4.3	4.9
Urban Female			
1993-94	13.8	11.3	10.6
1999-00	6.4	5.1	9.4

Source: NSSO 1997, 2001.

Unemployment Rates of the Youth

Table 13 indicates that unemployment rates are much higher among the youth than in the total population on different approaches. Urban unemployment rates for the youth are much higher than in the rural areas of Punjab. Youth unemployment rates for rural females are lower than males for all approaches, except the usual principal approach. On the other hand, urban unemployment rates for female youth are higher than males on all measures. Changes over time indicate that unemployment rates on different criteria for male youth in rural areas of the state have substantially increased during 1999-2000 as compared to 1993-94, whereas those for urban male youth have remained almost the same, except one per cent increase in the current daily status. On the other hand, rates for rural as well as urban female youth have significantly declined during the same period.

Table 13
Unemployment Rates among the Youth (15-29 years)

Status	Rural			Urban		
	Male	Female	Persons	Male	Female	Persons
Usual Principal Status						
1993-94	2.9	19.4	3.9	7.3	27.7	8.7
	1.4	7.1	1.8	3.3	8.6	3.8
1999-00	5.6	13.3	6.1	6.9	10.3	7.1
	2.3	6.2	2.6	3.1	3.5	3.2
Usual Status (adj.)						
1993-94	2.9	3.7	3.1	6.8	17.3	7.9
	1.3	1.2	1.3	3.1	5.3	3.4
1999-00	5.4	2.1	4.4	6.1	6.3	6.1
	2.3	0.9	1.8	2.8	2.1	2.7
Current Weekly Status						
1993-94	3.4	4.1	3.5	7.3	15.6	8.1
	1.9	1.5	1.8	3.4	4.8	3.6
1999-00	6.7	2.0	5.3	7.4	11.4	8.0
	3.1	1.0	2.4	3.9	4.3	3.9
Current Daily Status						
1993-94	4.3	6.2	4.7	7.9	18.7	8.9
	2.7	2.3	2.7	3.9	5.8	4.1
1999-00	8.0	3.6	7.0	8.9	13.9	9.5
	4.2	1.7	3.7	4.7	3.5	4.5

Source: NSSO 1997, 2001.

Note: Figures in the second row of each column denote unemployment rates for all ages taken together.

Magnitude of Unemployment

In addition to NSS data, estimates of unemployment are available from the State Employment Exchange, Economic and Statistical Organization and the Planning Commission, Government of India. According to the live register of employment exchanges, the total number of registered job seekers, both educated and uneducated, were 5.37 lakh as on September 2000 (Economic Adviser 2001). The problem of educated job seekers (with qualification of matriculation and above) is serious in the state. The total number of educated unemployed persons, which was 3.73 lakh (65.78%) in March 1999, increased to 3.96 lakh (73.61%) in March 2000. However, employment exchange data suffer from a number of constraints (Chand, 1993).

A recent survey by the Economic and Statistical Organization of Punjab of the unemployment situation in the state, conducted as a part of the Fourth Economic Census in 1998, indicates that the situation is the most serious in the age group of 18-35 years. According to this survey, there were 14,71,527 unemployed persons in the state, of which 10,40,269 (70.69%) belonged to rural areas and 4,31,258 (29.31%) to urban areas. Of the total estimated persons, 8,97,860 (61.62%) were educated and 5,73,667 (38.98%) uneducated, both literate (below matriculation) and illiterate (Economic Adviser, 2000). The shares of educated and uneducated unemployed persons in the rural areas were 56.17 per cent and 43.87 per cent respectively. However, the share of educated unemployed persons was much higher at about 73 per cent in urban areas. This indicates that the educational infrastructure is much better in urban areas, which is not the case in rural areas. Thus, a large rural workforce is deprived of better education

and training opportunities. Due to lack of appropriate training programmes for skill formation, uneducated unemployed persons have to be content in rural areas with disguised employment (Gill, S S 2001).

A district-level analysis of the unemployment situation in the state, based on this survey, indicates that districts with a relatively higher proportion of total unemployed persons in rural areas were Amritsar, Gurdaspur, Ferozepur, Sangrur, Ludhiana, Jalandhar and Patiala, with unemployment percentages varying from about seven in Patiala to 13 in Amritsar (Table 14). On the other hand, districts with a relatively higher proportion of work-seekers in urban areas were Amritsar, Jalandhar, Ludhiana and Patiala, with unemployment percentage varying from about eight in Patiala to 19 in Amritsar. The districts in which the proportion of educated job-seekers was very high in both rural and urban areas were Amritsar, Gurdaspur, Ludhiana, and Jalandhar. These districts are industrially important.

Table 14
District-wise Percentage of Total and Educated Unemployed Persons Desirous of Self-Employment in Punjab, 1998

State/Districts	Total unemployed persons			Educated unemployed persons		
	Rural	Urban	Total	Rural	Urban	Total
Gurdaspur	11.08	6.54	9.75	12.94	6.76	10.78
Amritsar	12.70	19.50	14.69	12.46	20.21	15.17
Ferozepur	9.73	7.49	9.07	7.19	7.70	7.37
Ludhiana	7.95	13.77	9.65	8.81	12.82	10.21
Jalandhar	7.37	15.37	9.71	7.96	15.85	10.72
Kapurthala	2.02	1.47	1.85	2.23	1.48	1.97
Hoshiarpur	6.24	2.46	5.13	7.75	2.90	6.06
Rupnagar	3.68	2.97	3.47	4.72	3.60	4.33
Patiala	6.90	7.84	7.07	6.04	7.88	6.68
Sangrur	8.43	6.76	7.94	7.48	6.03	6.97
Bathinda	4.86	3.88	4.57	3.94	3.50	3.79
Faridkot	2.22	2.55	2.32	1.82	2.22	1.96
Fatehgarh Sahib	2.98	1.71	2.60	2.97	1.67	2.51
Mansa	2.73	1.47	2.36	2.11	1.55	1.91
Muktsar	4.43	3.54	4.17	3.69	3.01	3.45
Nawanshahr	2.62	0.80	2.09	3.14	0.63	2.67
Moga	4.04	2.28	3.52	4.72	2.18	3.82
Punjab (No.)	10,40,269	4,31,258	14,71,527	5,83,851	3,14,009	8,97,860

Source: Economic Adviser, Government of Punjab, 2000

Estimates of unemployment in the Ninth Five-Year Plan (Planning Commission, 1999) indicate that the growth of employment has lagged far behind the growth of the labourforce, resulting in a high increase in unemployment in Punjab. It is estimated that the growth of employment during the Ninth Five-Year Plan (1997-2002) will be 0.73 per cent as compared to that of the labourforce, which will be 2.27 per cent during the same period. The projected growth rate of employment in the state is one of the lowest among major states. Hence, it is estimated that unemployment during the Ninth Plan will be 10,65,000 persons. However, its growth of employment the post-Ninth Plan period (2002-07) continues to be the same as in the Ninth Plan and the labourforce grows according to the projected demographic profile, the level of unemployment in the state will be higher than what is expected at the end of the plan period. In addition to Punjab, the other states which are expected to face prospects of increase in unemployment in the post-Ninth Plan period (2002-07) are Bihar, Rajasthan, Uttar Pradesh and Kerala. These estimates are based on NSS usual principal and subsidiary status concepts of

measurement of unemployment, which is the closest to the concept used in the population census to enumerate workers.

Quality of Employment

Not only is there the problem of open unemployment, the quality of large existing employment is low and deteriorating into an increasing level of underemployment. Underemployment is defined as underutilization of labour-time of workers. Two types of underemployment can be distinguished. Some of the persons usually employed do not have work throughout the year due to seasonality of work, or otherwise, and their labour-time is not fully utilized. The underemployment of this kind is termed as visible underemployment, where a person is available for work for shorter reference period. Visible underemployment is measured by cross classifying persons by their a) usual and current weekly statuses, b) usual and current daily statuses and c) current weekly and daily statuses. A proportion of workers employed, such as self-employed, may appear to work throughout the year but the work pursued by them may not be sufficient in terms of income generation. They would, therefore, want additional and/or alternative work. This type of underemployment is termed invisible underemployment and, therefore, not directly measurable. The proportion of the usually employed who are available for additional /alternative work, provides, by and large, an overall share of the employed who do not have enough work.

Table 15 indicates that the proportion of the usually employed, who were found not to be employed during the week preceding the date of survey, referred to as underemployment rate, declined for both rural and urban males during 1987-88 through 1993-94 and increased during 1993-94 through 1999-2000. A similar pattern is witnessed for urban females. On the other hand, the underemployment rate of rural females has substantially declined all through from 1987-88 to 1999-00. It may be observed that the problem of underemployment is more serious among usually employed females than males. For instance, the underemployment rate for rural females during 1999-00 was six per cent and for urban females, about 18 per cent during the same period. The corresponding percentages for usually employed males were only two and three.

The underemployment rate, on the basis of the activity pattern of the usually employed during different days within the reference week, is indicated by the distribution of their days by current daily status as displayed in Table 15. It may be observed that the proportion of underemployed females in both rural and urban areas was very high, as compared to males throughout the period 1987-88 to 1999-2000. For instance, during 1999-2000 the proportion of female underemployment was 47 per cent for rural areas and 33 per cent for urban areas. The corresponding percentages for males were only four each. The pattern of change during 1987-88 through 1999-2000 is similar to that of the usually employed by current weekly status, except that the rate for rural females has remained similar during 1993-94 through 1999-2000.

Some persons, categorized as working during a week, might not have had worked for the entire week. The distribution of persons working according to current weekly status by their current daily status, therefore, would indicate the proportion of person-days on which they have remained without work. Table 15 indicates that the percentage of person-days, on which persons with some work during the reference week were without work during 1999-2000, was about 33 for rural males, 43 for rural females, two for urban

males and 20 for urban females. The proportion of unemployed days showed a rising trend for rural males between 1987-88 and 1999-2000. When there was no work, a very high proportion of females as compared to males withdrew from the labourforce in both rural and urban areas.

Table 16 shows that the proportion of the usually employed, who did not work more or less regularly throughout the year, was higher for rural males and females than urban males and females during 1999-2000. The pattern of change over the period indicates that the percentage of rural and urban males and urban females declined between 1987-88 and 1993-94, but increased thereafter up to 1999-2000. The proportion of rural females who did not work regularly increased considerably from two per cent in 1987-88 to 12 per cent in 1999-2000.

Table 15
Per 1000 Distribution of Usually Employed (UPSS) by their Broad CWS and CDS

Rural Male	Usually employed (UPSS) by their broad CWS			Person-days of usually employed (UPSS) by their broad CDS			Person-days of persons employed according to CWS by their broad CDS		
	Emp-Loyed	Unemp-Loyed	Not in the Labour Force	Emp-Loyed	Unemp-Loyed	Not in the Labour Force	Emp-Loyed	Unemp-Loyed	Not in the labour force
1987-88	940	18	42	936	21	43	995	4	1
1993-94	986	7	7	972	16	13	984	8	6
1999-00	979	9	13	956	19	25	975	11	14
Rural Female									
1987-88	249	2	749	223	5	772	896	14	90
1993-94	895	1	104	527	1	473	589	1	410
1999-00	937	1	62	536	2	463	572	-	428
Urban Male									
1987-88	974	14	12	955	280	17	979	16	6
1993-94	994	2	4	985	7	8	991	4	4
1999-00	974	11	15	959	20	21	984	10	6
Urban Female									
1987-88	529	15	456	493	17	490	930	9	61
1993-94	951	-	49	777	--	223	812	1	187
1999-00	823	7	170	665	9	326	804	2	194

Source: NSSO 1990, 1997, 2001.

Table 16
Number of Workers (UPS) Who Did Not Work More or Less Regularly per 1000 Workers (UPS)

	1987-88	1993-94	1999-00
Rural Male	110	57	86
Rural Female	21	75	117
Total	-	58	88
Urban Male	72	37	79
Urban Female	84	9	50
Total	-	35	77

Source: NSSO: 1990, 1997, 2001.

Table 17 shows whether the usually employed were underutilizing their available labour-time due to lack of enough work or persons having enough work but not getting sufficient

return were seeking, or available, for additional work and alternative work. The percentage of usually employed who reported themselves as available for additional work, or alternative work, could serve as two indicators of underemployment. Table 17 presents the number of usually employed persons of age 15 years and above who sought, or were available, for additional work per 1,000 usually employed persons in the age group. About five per cent usually employed rural males and six per cent usually employed urban males had reported seeking or being available for additional work during 1999-2000. The corresponding percentages were three each for rural females as well as urban females. On the other hand, among those who sought alternative work during 1999-2000, 4.6 per cent were rural males, 5.6 per cent urban males, 1.1 per cent rural females and 4.7 per cent urban females. It may be observed that the number of those who sought additional/alternative work had considerably increased during 1999-00, indicating further deteriorating quality of employment.

Table 17
Number of Usually Working Persons of Age 15 years and Above per 1000 Usually Employed Persons in the Principal Status (15 years & above) Who Were Available for Additional/ Alternative Work

	Available for additional work			Available for alternative Work		
	1987-88	1993-94	1999-00	1987-88	1993-94	1999-00
Rural Male	90	24	54	75	21	46
Rural Female	16	18	34	3	14	11
All	-	24	53	-	21	44
Urban Male	54	15	57	48	18	56
Urban Female	95	20	33	32	38	47
All	-	16	55	-	19	55

Source: NSSO: 1990, 1997, 2001.

Employment in the Organized Sector

It is clearly evident that the state of unemployment and underemployment is serious in Punjab. This is confirmed when we examine employment generation in the organized sector and find that growth of employment in both the public and private sectors has declined. Table 18 indicates that about 70 per cent of the employment in the organized sector was in the public sector and 30 per cent in the private sector during 2000. The share of public sector employment has decelerated since 1985, whereas the share of private sector employment has increased from 26 per cent in 1985 to 28 per cent in 1990 and further to 30 per cent in 2000. Female employment in the organized sector in the state was 1.44 lakh (17%) during this period (IAMR 2001). The share of organized sector employment in total employment in the state was about nine per cent only in 2000. Obviously, a very large proportion of the workforce (91%) in the state is engaged in the informal sector. As compared to Punjab, the proportion of workforce engaged in the organized sector in the country is only about seven per cent (Planning Commission 2001a).

Table 18
Growth of Employment in the Organized Sector in Punjab (as on 31 March)

Sector	1981	1985	1990	1995	2000
1. Public Sector					
Central Government	67460 10.62	68010 9.65	69819 8.88	83693 9.95	79396 9.39
State Government	255505 40.23	276145 39.19	289787 36.85	296476 35.23	304198 35.97
Quasi Government (Central and State)	116606 18.36	143753 20.40	173104 22.01	182526 21.69	174433 20.62
Local Government	28244 4.44	31223 4.43	33487 4.26	32764 3.89	31759 3.75
Total (1) Public Sector	467795 73.65	519131 73.67	566197 72.00	595459 70.77	589786 69.73
2. Private Sector	167340 26.35	185478 26.33	220237 28.00	246000 29.23	255996 30.27
Grand Total	635135 100.00	704609 100.00	786434 100.00	841459 100.00	845782 100.00

Source: Economic Adviser, 2000

Note: Figures in the second row are percentage to the grand total

Table 19 shows that the growth rate of employment in the organized sector has constantly declined from 2.63 per cent in 1981-85 to 1.36 per cent in 1995-96 and further to 0.10 per cent in 1999-2000. The decline in the growth rate of employment in the public sector has been much faster than in the private sector. For instance, the growth rate of employment in the public sector declined from 1.75 per cent in 1985-90 to -0.19 per cent during 1999-2000, and in the private sector from 2.22 per cent to 0.80 per cent.

Table 19
Annual Compound Growth Rates of Employment
in the Organized Sector in Punjab

Year	Public Sector	Private Sector	Total
1981-85	2.64	2.61	2.63
1985-90	1.75	3.49	2.22
1990-95	1.01	2.34	1.36
1995-00	-0.19	0.80	0.10
1981-90	2.14	3.10	2.40
1990-2000	0.41	1.52	0.73

Source: worked out from Table No. 12.17

It should be noted that there is a strong preference for white-collar jobs in the organized sector, especially government jobs, rather than unorganized jobs because of assured regular income and other social security benefits. The economy has to grow at a high rate, if the expectations of the labourforce about the creation of employment in the organized sector has to be met. In the absence of the expansion of government employment in the organized sector, the possibility of creating more jobs in the private organized sector has to be explored.

Wages of Casual Workers

Wages of casual workers in public works in rural areas in Punjab are lower than in Himachal Pradesh and Jammu & Kashmir. Wages of women in these works in the state are the lowest (Table 20). However, it should be mentioned here that the estimates for Punjab are based on a very small sample. Wages in other than public works in the state are higher in urban areas than in rural areas. Wages of women in these works are substantially lower than those of men in the state and of women in other states. Wages paid to agricultural labour in the state during 2000 for various agricultural operations, such as ploughing, sowing, weeding, harvesting, ranged from Rs. 78 per day for weeding to Rs. 99 for harvesting (Economic Adviser 2001). The increase in the share of casual labour is considered an indication of deteriorating employment quality, where job-security and other benefits are not ensured. Increase in casual labour should be accompanied by growth of productivity and real wages.

Table 20
Average Daily Wage (Rs.0.00) for Casual Workers of Age Five Years and above Engaged in Public and other than Public Works, 1999-00

State/Country	Rural Public Works		Other than Public Works			
	Male	Female	Rural		Urban	
			Male	Female	Male	Female
Punjab	57.14	18.71	65.86	49.48	82.40	53.09
Haryana	43.30	28.57	62.65	51.01	68.47	47.74
Himachal Pradesh	75.70	51.00	67.06	50.36	70.99	50.30
Jammu & Kashmir	83.79	23.75	77.04	66.07	97.65	71.48
Rajasthan	36.22	50.28	55.19	37.02	67.07	45.35
India	48.14	38.06	44.84	29.01	62.26	37.71

Source: NSSO: 2001.

Strategy for Employment Generation

The Task Force on Employment Opportunities, set up by the Planning Commission, has very appropriately identified the following five broad areas, which together would constitute an appropriate strategy for employment generation (Planning Commission 2001b):

- Accelerating the rate of growth of the economy, especially in sectors, which would ensure the spread of income to the low-income segment of the labourforce.
- Pursuing appropriate policies in individual sectors, which are important for employment generation. These sector-level policies must be consistent with the overall objective of accelerating the growth of the state domestic product.
- Implementing focused special employment programmes for creating additional employment and enhancing income generation for existing activity, aimed at helping weaker sections of the society that might not be sufficiently benefited by the more general growth promoting policies.

- Pursuing suitable policies for education and skill development, which would upgrade the quality of the labourforce and make it capable of supporting a growth which generates high quality jobs.
- Ensuring that the policy and legal environment governing the labour market encourages labour absorption in the organized sector.

The following sections discuss broadly aspects of employment generation and related issues in Punjab.

EMPLOYMENT GENERATION: POTENTIAL SECTORS

The agricultural sector in Punjab is very important in terms of its contribution to employment and income generation and hence cannot be ignored at the policy level, despite its declining share. However, it should be kept in mind that this sector has a limited capacity to engage a larger workforce, as it suffers from disguised unemployment. From the long-term point of view, expansion of employment opportunities has to be explored in the non-farm sector. A significant shift in the labourforce must take place from agriculture to non-agricultural activities. In addition to speeding up reforms in the agricultural sector, such as liberalizing leasing of land, diversification to non-cereal crops, improvement of quality of agricultural produce, promotion of agricultural exports, it is necessary to encourage allied activities which are more labour-intensive and provide greater attention to agricultural and rural infrastructure development. Since long there has been much talk on diversification and value addition through agro-processing for a long-time, but not much progress has been made in this direction.

Agro- and Food- processing

India is the largest producer of fruits and vegetables in the world, but only less than two per cent of the production is processed, as compared with 80 per cent in Malaysia, 78 per cent in the Philippines, 70 per cent in Brazil and 30 per cent in Thailand. In Punjab, a major producer of fruits and vegetables and with a large livestock population, the food processing industry is a potential area where there is large scope for expansion. Horticulture and vegetables are labour-intensive activities and hence, higher employment opportunities can be generated in this sector. Serious attention has to be paid to quality and marketing infrastructure and other necessary conditions have to be created for large-scale promotion of these activities through emphasis on R & D, extension and training, development of food parks, strict quality control and testing labs, cold storage, warehouses, air conditioned transport, and removal of various constraints. Animal husbandry and dairying contribute significantly to employment and income generation and have potential for further development, if steps are taken for disease control, improvement in genetics, extension services, strengthening of marketing and credit infrastructure and provision for adequate quality of fodder and feed. Value addition to abundant unprocessed agricultural production will promote forward and backward linkages resulting in higher income and employment opportunities in the state.

Manufacturing Industries

Small-scale industries (SSIs) dominate the industrial scene in Punjab in terms of their contribution to employment, income generation and exports of industrial products. Only a few large and medium industries exist in the state. The State Industrial Policy of 1996

has attempted to create an investment-friendly environment in Punjab. However, in the process of liberalizing the economy, there is need to increase competitiveness, efficiency and quality of manufactured products. There is need to dereserve items manufactured by SSIs in a phased manner to allow competition and growth, as suggested by the Expert Committee on Small Enterprises, 1997, headed by Abid Hussain. Reservations for small-scale industry have prevented India from becoming a global power in labour-intensive mass manufacturing, that would, in turn, create very large factory jobs at home, as it has happened in China.

It is argued that the impact of WTO will affect certain industries, which are unable to compete in the short run. But in the long run, it will have a favourable impact on output and employment. The Study Group on Small Enterprises, set up by the Planning Commission, which submitted its final report in May 2001, has made a number of useful recommendations to promote SSIs, such as redefining SSIs, improving fiscal incentives, providing easy access to credit, capital subsidy for technology upgradation and improvement of infrastructure, so that new challenges can be faced in the changing economic environment. It is recognized that as restructuring takes place, the number of SSIs may indeed be reduced and some of the weaker units displaced by others, which will expand as a result of enhanced competitiveness. This is a normal process of structural evolution and is consistent with strengthening the sector as a whole. The fear that it will lead to a reduction in output or employment may not be valid, since restructuring might permit deeper penetration of world markets, which would generate a larger volume and higher quality of employment than is the case at present (Planning Commission 2001a). The decline in weaker enterprises in the wake of restructuring the economy can be offset by the expansion of employment in stronger enterprises. It is argued that the total employment generated by the restructured industry is likely to be more sustainable and growth-oriented in the long run. This requires a radical shift in policy from protection to promotion. The relationship between SSIs and large industries must also be seen as mutually supportive and not against each other.

Construction

Construction has recorded a higher growth of employment in the recent period. With appropriate policy measures, this sector can play an important role in generating higher employment in infrastructure building. The growth of this sector has a positive impact on the growth of related sectors of the economy. The employment effect of construction growth is very high, not only because of its high employment elasticity but also because of the high employment multiplier effect it has among major sectors of the economy.

Service Sector

The service sector is very important for the future growth of employment. Most of the developed nations are dominated by service activities in terms of their contribution to income and employment generation. In Punjab, service activities have grown faster in the 1990s and have scope for further expansion, if necessary policy interventions are made. The potential areas in this sector are tourism, information technology, housing and real estate, road transport, trade, education and health. A sizeable growth of employment opportunities is expected to take place in the service sector in future. Banks have so far been concentrating on priority sectors for credit. Keeping in view the future prospects of the service sector in generating substantial employment, credit needs of this sector should not be ignored.

Employment in the Unorganized Sector

The contribution of the unorganized/informal sector in the state is significant in terms of employment and income generation. More than 90 per cent of the workforce is engaged in activities in the informal sector. Similarly, about 93 per cent of the workforce earns its livelihood in the unorganized sector in the country and its contribution to the net domestic product has been 60.5 per cent of the total national net domestic product (CSO 2001). Though this sector provides employment to the largest workforce, it has to function under severe constraints and the quality of most of the employment generated is low. The constraints faced by this sector limits its capacity to absorb a longer labourforce. Especially the general lack of credit availability through formal financial institutions inhibits the expansion of informal sector activities and hence, the growth of employment (Chand 1993a, 1997). It has been observed that under the present economic order, the growth of employment in the organized sector has considerably declined in recent times and there is not much scope of employment expansion especially in the public sector. It is essential, in the circumstances, that special efforts should be made to fulfil the financial requirements of the economically viable enterprises in the unorganized sector, so that the projected growth rate can be achieved.

SPECIAL EMPLOYMENT PROGRAMMES

Programmes for Rural Areas

Several State and Centrally sponsored programmes are in operation for self-employment and wage-employment generation (Chand 1996) for vulnerable sections of the society, who are below poverty line in the state. Programmes with state share are especially designed for poverty alleviation in the rural and urban areas. The major Centrally sponsored scheme in the rural areas are Integrated Rural Development Programme (IRDP) with sub-schemes, Training of Rural Youth for Self-Employment (TRYSEM), Million Wells Scheme (MWS), Supply of Improved Toolkits to Rural Artisans (SITRA) and Development of Women and Children in Rural Areas (DWCRA). These schemes have been brought under Swaran Jayanti Gram Swarozgar Yojana (SGSY) launched in April 1999-2000. The restructuring of IRDP is considered a step in the right direction for improvement in the programmes. The objective of SGSY is to provide sustainable income to the rural poor. The programme aims at establishing a large number of micro-enterprises in rural areas. It is envisaged that every family assisted under the SGSY will be brought above poverty line in three years. During the year 1999-00, assistance amounting to Rs. 327.72 lakh (subsidy+loan) was provided to 1,694 beneficiaries. In the current year, an assistance of Rs. 900.82 lakh (subsidy+loan) has been provided to 3,273 beneficiaries up to September 2000. During the year 1999-2000, 1,046 Scheduled Castes (SC) beneficiaries were provided loans amounting to Rs. 181.88 lakh and up to September 2000, an amount of Rs. 497.48 lakh was given to 1,958 SC beneficiaries (Economic Adviser 2001)

Low productivity and unemployment are the factors responsible for rural poverty. It, therefore, becomes imperative to increase productivity and enhance employment in rural areas. An employment-oriented growth strategy can achieve this goal in the medium and long run. In the short run, supplementary employment has to be provided to the needy, especially in agriculturally lean seasons. To meet this specific requirement, two wage-employment programmes were put into operation-- the National Rural Employment Programme (NREP) and the Rural Landless Employment Guarantee Programme

(RLEGP). From 1, April 1989, NREP and RLEGP merged into Jawahar Rozgar Yojana (JRY). The main objective of JRY is generation of additional gainful employment through creation of rural infrastructure and community and social assets. Another wage-employment scheme for rural areas is the Employment Assurance Scheme (EAS), which provides employment in the agricultural lean season and thus generates supplementary wage-incomes through public works programmes. JRY has been replaced by Jawahar Gram Samridhi Yojana (JGSY), which is now conceived as a rural infrastructure development scheme which also provides employment to the rural poor.

Table 21
Financial and Physical Progress of Centrally Sponsored Employment Generating Schemes in Punjab during 2001-02

	JGSY	EAS	SGSY
Financial Progress (as on 25.5.2002)			
Total funds available (Rs. in lakh)	1375.92	1020.75	380.75
Percentage of expenditure	54.28	47.62	103.38
Physical Progress (as on 18.5.2002)			
Unit	Lakh mandays	Lakh mandays	Total Swarozgaris assisted (No.)
Total target	00	14.04	00
Total achievement	5.38	3.75	4251
Percentage of achievement	00	26.7	00

Source: Internet: Ministry of Rural Development Website.

Table 21 shows that out of the total funds available for JGSY and EAS during 2001-02, only 54.28 per cent and 47.62 per cent respectively were utilized. Against the target mandays of 14.04 lakh to be generated through EAS, the achievement has been only 26.7 per cent. This may be partly responsible for the under-performance of these schemes in the state.

Programmes for Urban Areas

Migration from rural areas is seen as the main cause for urban growth as well as urban poverty, making urban poverty alleviation an important issue. The Nehru Rozgar Yojana (NRY) and the Prime Minister's Integrated Urban poverty Eradication (PMIUPEP) have been two urban poverty alleviation programmes. NRY had consisted of three schemes: (i) Scheme for Development of Urban Micro Enterprises, (ii) Scheme for Urban Wage Employment and (iii) Scheme for Housing and Shelter Upgradation. NRY has now been replaced by a new scheme, Swaran Jayanti Shahari Rozgar Yojana (SJSRY), which has three components namely (i) Urban Self-employment Programme, (ii) Urban Wage Employment Programme and (iii) Development of Women and Children in Urban Areas. Under the Urban Self-employment Programme, loans and subsidy amounting to Rs. 904.30 lakh were given to 3,120 beneficiaries during 1999-2000. In the current year up to September 2000, an amount of Rs. 589.78 lakh has been provided to 841 beneficiaries. During 1999-2000, 987 SC beneficiaries were given Rs. 315.80 lakh and in the current year up to September 2000, 288 SC beneficiaries have been provided an amount of Rs. 226.37 lakh. Under the Urban Wage Employment Programme (UWEP), which seeks to provide wage employment to persons below poverty line, living within the jurisdiction of urban local bodies with a population of less than five lakh, 1.62 lakh

mandays were generated with an expenditure of Rs. 482.00 lakh during 1999-00 and another 0.66 lakh mandays on an expenditure of Rs. 211.00 lakh upto September 2000. Under the Development of Women and Children Scheme, Rs. 30.81 lakh were distributed to 90 beneficiaries as loan and subsidy up to September 2000. Out of 90 beneficiaries, 45 SC beneficiaries were given assistance of Rs. 16.34 lakh (Economic Adviser 2001).

In addition, schemes for the economic upliftment of Scheduled Castes and Backward Castes, through setting up economic ventures, are being implemented at the state level. For example, the Punjab Backward Classes Land Development and Finance Corporation (BACKFINO) and Punjab Scheduled Castes Land Development and Finance Corporation provide loan and subsidy under different schemes.. Besides, under bank tie-up, loans for families living below poverty line, in both rural and urban areas, are also arranged by both Corporations. BACKFINO provided loans to the tune of Rs. 462.89 lakh to 793 beneficiaries during 1999-2000. In the current financial year up to September 2000, an amount of Rs. 314.29 lakh has been paid to 611 beneficiaries. The Punjab Scheduled Castes Land Development and Finance Corporation provided loans amounting to Rs. 1587.47 lakh to 7,706 beneficiaries during 1999-00. In the current year, upto September 2000, an amount of Rs 532.48 lakh has been given to 2,328 beneficiaries.

Under the Prime Minister's Rozgar Yojana (PMRY), a 100 per cent Centrally sponsored scheme, which provides self-employment opportunities to educated youth, 1,4253 cases have been sponsored to the banks against the target of 9,000, out of which 5,984 cases have been sanctioned loans up to November 2000. Besides, agriculture finance for self-employment through Punjab State Co-operative Agricultural Development Bank is provided for allied agricultural activities. Punjab Khadi and Village Industries (KVI) provide financial assistance for self-employment in different industries/schemes. Punjab Agro-Industries Corporation provides self-employment opportunities to unemployed youth. The Punjab State Cooperative Supply and Marketing Federation (MARKFED) also encourages self-employment, through a scheme of allotment of dealership of its products to unemployed graduates in the state. C-Pyte (Centre for Training & Employment of Punjab Youth) provides employment-oriented training and upgrades the skills of educated youth of the state to make them employable. Under this scheme 48,367 youth have been absorbed till date in various public and private organizations. Financial assistance through banks for dairy development is also provided for self-employment, of the candidates from rural areas, after adequate training.

The Khadi and Village Industries (KVI) sector has potential for creating new jobs at low cost. This sector not only provides employment in rural areas at low investment per job, but also utilizes local skills and resources and provides part-time and full-time work to rural artisans, women and weaker sections of the society. Financial assistance is provided at the prevailing bank rate, with 25 per cent margin money subsidy upto loans of Rs 10 lakh. Expansion of village industries will ensure an increase in income levels and quality of life of rural workers and craftsmen. Important KVIs contributing to production and employment in the state are processing of cereals and pulses, ghani-oil industry, gur and khandsari industry, carpentry and blacksmithy. These industries have provided full-time and part-time employment to 83,661 persons in the state.

Government provides funds under various plan schemes every year to deal with the unemployment situation in the state. The approved outlay for different employment

generation schemes in the Ninth Five Year Plan (1997-02) is Rs 3,531.53 crore. It is expected to generate direct and indirect employment of 17.55 lakhs persons during the plan period. An outlay of Rs 586.82 crore has been made to implement employment-generating schemes for providing employment to 1.81 lakh persons during 2002-03 (Department of Planning, *Ninth Five Year Plan 1997-2002* and *Tenth Five-Year Plan 2002-07* and *Annual Plan 2002-03*). Thus, a substantial amount of resources is being spent on employment generating schemes in the state.

However, a number of evaluative studies on various employment-generating schemes, especially Centrally sponsored schemes, have identified gross mismanagement responsible for the underperformance of these schemes. The Planning Commission's account of various poverty alleviation schemes often reads like a criminal charge sheet. Writing about one rural programme, the report cites 'leakages, misappropriation of funds, violation of programme guidelines, selection of the non-poor as target group, absence of proper maintenance of accounts and poor quality of assets'. It has been calculated that last year Rs 46,000 crore in subsidies had been budgeted for largely ineffective schemes in the country to help the poor. Hence, it is suggested they should be cut in half and the money spent on infrastructure instead (Unger 2001). Similar views have been expressed about these schemes in the *Draft Approach Paper to the Tenth Five-Year Plan (2002-07)* (Planning Commission 2001a).

An evaluation study of all rural development programmes in the Jalandhar district of Punjab revealed, that though these programmes have contributed to the upliftment of the rural poor over a period of time and created durable assets, they suffer from a number of serious maladies at the implementation level, which considerably reduce their efficacy and effectiveness (Chand 1999). There has been lack of concern in responding to real market demand for self-employment schemes and very little interaction with the beneficiaries at the grassroots. Official apathy, lack of monitoring, non-adherence to guidelines, casual approach of various functionaries at various levels are responsible for the poor performance of these schemes. Most of the elected heads of Panchayat did not have any training for the implementation of JRY works. Muster rolls were not maintained properly in the majority of cases. Contractors executed and supervised the JRY works. Workers from outside the village were brought in by the contractor. The share of women in employment generation was insignificant. Annual plans were not discussed at the Gram Sabha meeting.

Reorientation of the employment and anti-poverty schemes has to be undertaken to improve the situation during the Tenth Plan. The problem of disguised unemployment and underemployment is serious in the state and the growth process may not be fully during the plan period. The appropriate instrument for addressing this specific problem is the Employment Assurance Scheme (EAS), which has been designed specially for this purpose and should be implemented on the pattern of the Maharashtra Employment Guarantee Scheme, which has been a success (ILO 2000).

Poverty and Unemployment

Despite the low ratio of employment to growth, Punjab has been able to reduce the incidence of poverty because of the high level of agricultural productivity per worker. Employment elasticity to SDP in the state was one of the lowest, 0.30, followed by Tamil Nadu and Haryana during 1983-94. Male agricultural productivity during 1992-95 at 3.01 was the highest in the country. This helped reduce poverty by 4.4 per cent during 1983-

94 (Planning Commission 1999). Further, the proportion of persons below the poverty line in the state has come down from 11.5 per cent in 1993-94 to 6.36 per cent in rural areas and 11.35 per cent to 5.75 per cent in urban areas during 1999-00. For the state as a whole, it has declined from 11.77 per cent in 1993-94 to 6.16 per cent in 1999-2000.

SKILLS, TRAINING AND EMPLOYMENT

Mismatch between Supply of and Demand for Skills

Mismatch between skill requirements of employment and the skill base of the unemployed is one reason for unemployment. This is likely to become more acute in the process of rapid structural changes in the economy. Skills and training in the state are acquired through various training systems, such as hereditary skills acquired in the family, on the job training, education related to work through educational institutions, vocational training through specialized institutions such as it is, and formal apprenticeship.

It is widely recognized that the rapid expansion, particularly of higher education, has also contributed to the mismatch in the labour market. It is felt that while shortages are often experienced, of middle-level technical and supervisory skills, graduates and post-graduates in arts, commerce and science constitute a large proportion of the educated unemployed. High private rates of return on higher education, resulting to a large extent from low private cost, is an important reason for the rush for higher education despite high incidence of educated unemployment. At the same time, after completion of schooling, very few join vocational courses. Efforts to strengthen vocational education are needed. We have to learn from the experiences of those economies which have made tremendous progress through vocational education. Table 22 indicates that of the total job seekers in Punjab during 2000, 73 per cent were educated and 27 per cent uneducated, and of the total educated 24 per cent were technically qualified and 76 per cent non-technically trained. Further, out of the total technically unemployed about 37 per cent were ITI trained craftsmen, eight per cent diploma engineers, six per cent para-medical personnel, 36 per cent B. Ed and M. Ed teachers and nine per cent other teachers.

It is, therefore, necessary to orient the educational and training system towards improving its capability to supply the requisite skills in the medium and long run, so as to enable it to respond quickly to the needs of the labour market in the short run. Besides, the system should also be in a position to impart suitable training to the large proportion of workers engaged as self-employed and wage earners in the informal sector, for upgradation of their skills so as to raise their productivity and incomes levels.

Low Level of Skilled Manpower

Skill-levels and training have a decisive impact on the growth of income and employment. However, quantification of skill-levels is not easy due to data constraints. Information on educational attainments of workers is available. Table 23 indicates that education levels of workers in Punjab, as well as in the country as a whole, are quite low. According to the 1991 Census, about 42 per cent of the main workers were illiterate, another 18 per cent below middle-level class and only 40 per cent of the workers of the state, as compared to 51 per cent in the country as a whole, were middle

school and above. However, this information pertains to general education and not skilled manpower, for which information is not easily available. We have some information for the country as a whole on 30 specific marketable skills possessed by persons in the labourforce. In rural areas, only 10.1 per cent of male workers and 6.3 per cent of female workers were equipped with specific marketable skills.

Percentages of skilled manpower were higher in urban areas with 19.6 for males and 11.2 for female workers (NSSO 1997). The level of vocational skills, in the labourforce in India is very low as compared to other countries. For instance, in the age group of 20-24, only five per cent of the labourforce in India has vocational skills whereas in developed countries the percentage varies between 60 and 80, which is much higher. The percentage for Korea at 96 is very high. Many developing countries too have a much higher percentage of skilled manpower than India, for example, in Mexico, it is 28 per cent, Mauritius, 36 per cent and Botswana 22 per cent (Planning Commission, 2001a).

Table 22
Technically Qualified Job Seekers on the Live Register of Employment Exchanges in Punjab

Category	As on 31 March						
	1990	1996	1997	1998	1999	2000	Up to 30.9.2000
Educated	335456	325879	365483	373094	372970	396414	393768
Technical							
Graduate Engineers	437 0.50	1052 1.22	1000 1.00	931 0.95	966 1.01	1020 1.08	736 0.79
Diploma Engineers	5189 5.97	7213 8.35	7124 7.14	7205 7.37	6623 6.93	6532 6.94	7057 7.59
I.T.I. Trained Craftsmen	28147 32.37	33516 38.79	35006 35.08	35665 36.50	35575 37.24	34936 37.12	34515 37.11
Other Craftsmen	5957 6.85	1873 2.17	1980 1.98	3332 3.41	2872 3.01	2734 2.90	2774 2.98
Allopathic Doctors	27 0.03	60 0.07	75 0.07	106 0.11	134 0.14	126 0.13	72 0.8
Other Doctors	275 0.32	481 0.56	409 0.41	394 0.40	380 0.40	387 0.41	249 0.27
Para-medical Personnel	3887 4.47	4452 5.15	5159 5.17	5291 5.41	5114 5.35	5413 5.75	5451 5.86
Agricultural Specialists	643 0.74	640 0.74	604 0.61	653 0.67	546 0.57	460 0.49	214 0.23
Veterinary Graduates	4 -	10 0.01	23 0.02	31 0.03	27 0.03	18 0.02	19 0.02
Dairy Graduates	- -	3 -	5 -	1 -	6 -	5 -	2 -
Teachers (B.Ed. & M.Ed.)	23425 26.94	27173 31.45	37038 37.11	3472 35.54	36655 38.38	34459 36.61	33817 36.37
Teachers (J.B.T.)	3083 3.54	878 1.02	1339 1.34	1072 1.10	1480 1.55	1550 1.65	1697 1.82
Teachers (others)	15885 18.27	9059 10.48	10135 10.16	8310 8.50	5163 5.40	6479 6.88	6368 6.85
Technical (Total)	86959 100.00	86410 100.00	99797 100.00	97717 100.00	95541 100.00	94119 100.00	92971 100.00
Non-Technical (Freshers)	248497	239469	265686	275377	277429	302295	300797
Graduates	35934	29984	31285	30239	28600	27021	27957
Post-Graduates	10581	8305	7882	7832	6910	6990	6004
Matriculates and under-Graduates	201982	201180	226519	237306	241919	268284	266836
All others	286806	222048	187486	203563	193939	141977	142756
Total (I+II)	622262	547927	552969	576657	566909	538391	536524

Source: Economic Adviser 2001.

Such existing training institutions, as Industrial Training Institutes, have undoubtedly been meeting a significant part of the requirements of skilled manpower for organized industry. The need, however, seems to exist for expeditious restructuring and reorientation of their courses are quickly to respond the labour market. Greater involvement of industry in planning and running the training system would also be necessary for this purpose.

Table 23
Percentage Distribution of Main Workers According To Education Level, 1991

Education Level	Punjab	India
Illiterate	41.5 (36.75)	51.0 (19.56)
Below primary	3.9	7.8
Primary but below middle	14.2	13.9
Middle but below matric	12.3	10.9
Matric but below graduate	22.4	11.9
Graduate and above	5.7	4.4
Total main workers (in lakh)	60.98	2859.32

Source: Director of Census Punjab 1991; Planning Commission, 1999.

Note: Figures in brackets refer to percentage of workers who are unemployed.

Quality of Skills and Training

The quality of training imparted by some of the institutions is not up to the mark. For instance, much of the training provided by ITIs is for skills for which there is little current demand. The curriculum has not been revised for a long time and is not attuned to current market requirements. Skills acquired by the students are poor and not required by the employers. The facilities and infrastructure in most ITIs are inadequate and the equipment obsolete. There is a shortage of trained faculty in these institutes. According to employment exchange data, a large proportion of the technically trained manpower from ITIs and other institutions has remained unemployed. Evaluation of special training programmes indicates that the number of those who had been trained were either unemployed, or not employed in the trade in which they had received training. Thus, there is immediate need for expansion of specialized training through IITs. The role of the private sector in higher general education and technical education must be expanded. The existing ITIs must be strengthened and modernized. The industrial sector should be more involved in the management of ITIs at various levels. Improvement of vocational education at the school-level has to be emphasized. The apprenticeship system has to be strengthened. There is dire need for greater involvement of the private sector in the entire process, with the support of public sector as facilitator, to achieve the vast improvements required in the quality of training and skills.

No training facilities oriented towards the needs of the informal sector exist, which is otherwise expected to provide for a large part of the expansion in employment. With regular wage-employment shrinking, the educated unemployed have to find job-opportunities as self-employed, which are mostly in the informal sector or outside the organized sector. This suggests the need to pursue strategies that help the informal sector to expand, particularly in high-growth areas, where the income levels in the unorganized sector can be expected to be fairly reasonable. It should be noted that various aspects of employment, unemployment and related issues have been comprehensively dealt with in the Reports prepared by the Government of India (Planning Commission 2001b, 2001c, 2002; Ministry of Labour 2002).

FUTURE GROWTH OF EMPLOYMENT

The slow growth of employment may be primarily due to the fact that the SDP growth rate actually achieved has fallen short of what was expected during the plan periods and growth of employment has not taken place according to the elasticities of employment projected during the plans. Thus, in order to generate additional productive employment opportunities and improve the quality of existing employment during the Tenth Five-Year Plan and beyond, the growth of the economy has to be accelerated to higher levels. Hence, the emphasis is on growth-led employment generation. The investment level has to be raised substantially to attain higher growth rate of the economy in future and its efficient use has to be ensured to the extent possible. That would result in higher employment elasticity. The rate of investment (gross state capital formation) as a percentage of GSDP, and the efficiency of investment measured by the incremental capital-output ratio (ICOR), are two critical determinants of growth, which are important from a policy point of view for accelerating growth in the future.

The rate of investment in Punjab has varied between 1993-94 and 1999-2000, averaging 22.4 per cent, whereas the average growth rate during this period was about 4.2 per cent (Table 24). This gives an ICOR of 5.3 per cent. By applying this ICOR, an acceleration from 4.2 per cent growth to five per cent would need an investment rate of 26.7 per cent. Similarly, acceleration to six per cent, seven per cent and eight per cent would require investment rates of 32.0 per cent, 37 per cent and 42.6 per cent respectively. In this respect, the performance of the country as a whole has been far better, as it has achieved a growth rate of 6.5 per cent with an average rate of investment of 24.4 per cent giving an ICOR, of 3.7 per cent during 1992-93 to 1999-2000. Acceleration of growth from 6.5 per cent to eight per cent and nine per cent would require an increase in investment rate of 30 per cent and 34 per cent at the national level. To achieve a very high rate of investment is not an easy task. However, policies to reduce ICOR resulting in efficient use of capital, can also help attain a higher growth with a relatively lower investment level. Domestic savings, have to be maintained at an adequate level as these constitute the major source for financing investment in addition to raising foreign direct investment (FDI) to meet any shortfall. Improvement in efficiency in every sector is imperative if the targeted rate of growth has to be achieved. To attain efficiency, domestic and international competition is very essential, though it could have some adverse effect on employment, initially. China could achieve a higher growth rate of the economy because of a very high rate of domestic investment and FDI.

Table 24
Average Investment Rate and Growth Rate (1993-94/1999-2000)

Rate of investment	22.4 (24.4%)
Growth rate	4.2 (6.5%)
Incremental capital-output ratio	5.3 (3.7%)
To achieve growth rate of:	Estimated investment required:
5 per cent	26.7 per cent
6 per cent	32.0 per cent
7 per cent	37.3 per cent
8 per cent	42.6 per cent

Source: Economic Adviser, Statistical Abstracts of Punjab

Note: Figures in parentheses are for the country as a whole

Thus, if accelerated growth of gross state domestic product (GSDP) has to be the core of a viable strategy for employment generation, a policy framework for action for its rapid growth of GSDP must be regarded as the essential precondition. Following areas can be regarded critical at the level of macro-economic policy (Planning Commission 2001b).

- i) Achieving high rate of investment.
- ii) Improvement in efficiency.
- iii) Improvement in infrastructure.
- iv) Improvement in financial system.
- v) Credit availability for informal sector

IMPLICATIONS FOR EMPLOYMENT POLICY

1. The districts, which are industrially important, such as Amritsar, Ludhiana and Jalandhar, have a very high proportion of those seeking employment. There is immediate need for appropriate intervention in these areas for enhancing employment opportunities.
2. Underemployment in the state has increased in recent times. This indicates the deteriorating quality of employment. In fact, the major challenge is the replacement of existing low-quality jobs with high-quality jobs.
3. Appropriate employment opportunities have to be created for the better educated, which could ensure a higher income level.
4. Unemployment among youth in the state is comparatively higher than among all ages. If the energy of the youth is not channelled properly by providing adequate work opportunities, they might indulge in acts, which would be detrimental to the society.
5. Female work-participation rate has been very low in the state reflecting on the status of women's empowerment. A large proportion of women workers in the state are engaged in a subsidiary capacity in low productivity activities with very low earnings. A large number of them have to work under highly exploitative and discriminatory conditions. Efforts to provide decent employment to women should also include legal protection against women-specific exploitation. There is need to study in detail various aspects of, and activities in which women are engaged.
6. The private sector has to be encouraged for generation of higher employment in the state. Regular jobs in the organized sector can be increased if serious and sincere efforts are made to remove the bottlenecks, which discourage rapid expansion of regular employment in the private sector. One of the major constraints is inflexible labour laws. Changes in the labour laws, the process for which has already begun, can provide greater flexibility for the expansion of employment.
7. Creation of regular employment in the near future will not be substantial. A large volume of better quality employment has to be generated through self-employment. Therefore, adequate policy steps have to be taken to promote self-employment opportunities.
8. Despite increase in self-employment opportunities in the state, a large work force will continue to work as casual labour, thereby keeping a large number of households poor. There is need to improve the quality of such employment in terms of higher working days and better real wages, which can be ensured through faster growth of the economy.
9. Activities in the non-agricultural sector have to be promoted and excessive dependence on the agricultural sector has to be reduced for better quality of employment and incomes and hence, to achieve a higher rate of growth of the

economy. Sectors, which have comparative potential of higher employment generation in the future are, apart from agro- and food-processing, small-scale industries, construction, trade, tourism, transport, communication, information technology and other services. These sectors have achieved significant growth during the post-liberalization period. It is expected that the most of the employment to be generated in the next few years will be in the services sector. Thus, vast improvements in this sector can create large quality employment. Extensive economic and social infrastructure development is the need of the time to promote overall growth of the economy. Private investment needs to be encouraged in this sector for speedier results. Faster development of non-farm activities, especially in rural areas, will be helpful in checking rural-to-urban migration.

10. The unorganized sector assumes greater significance for future expansion of employment, as the growth of employment in the organized sector has substantially declined. However, to promote wage and self-employment in this sector, its various needs especially for those viable from a long-term point of view have to be met.
11. Various employment generating programmes for the vulnerable sections of society need to be effectively implemented after proper restructuring, making them leakage proof through constant monitoring and fixing of responsibility for any lapses. A casual approach to the handling of these schemes has to be shed and their smooth functioning ensured. There is also need to restructure the KVIC programme to enhance its product quality and competitive ability.
12. The ITIs and other technical institutions are in need of upgradation and modernization in terms of infrastructure, staff and courses. The system of specialized higher technical education needs to be strengthened, if our technical manpower is to avail of the opportunities in the international labour market. Industry should be involved in the management of these institutions. The private sector has to be encouraged to play an important role in imparting vocational training. Such institutions as IITs and IIMs, which are known for their quality of talent, have to be promoted. Several developed countries could achieve higher levels of growth because of a very high level of vocational and technical education. Training systems of these countries need to be studied.
13. At the prevailing growth rate, it will not be possible to achieve significant improvement in the employment situation. Indeed, a very high investment rate is required if we want to achieve a higher rate of growth of the state economy during the Tenth Five-Year Plan, along with an increase in efficiency of capital use, i. e., reduction in ICOR. Hence, there is a need to achieve higher investment rate to ensure growth-led employment generation in the economy.

Keeping in view the seriousness of the unemployment problem, the authorities concerned in the state have intensified efforts to make available higher employment opportunities, especially for educated persons, through several ways, such as identifying workers in short supply and high demand in the private sector, identifying skill gaps through surveys, improving the quality of training to narrow down the mismatch of demand and supply, promoting on-the-job training by involving employers in the private sector, strengthening the Overseas Employment Cell for those desirous of working abroad, setting up the Youth Employment Board with the collaboration of ILO, providing training by starting coaching centres at the employment exchange level and making online services available for better information.

II INDUSTRIAL RELATIONS IN PUNJAB

INTRODUCTION

'Labour is the source of all wealth and all life-sustaining activity on earth. If we just cast a glance around us, we find any thing that is not a work of Mother Nature, is the work of human labour. Indeed, to work itself is the essential attribute of human nature' (*Journal of Workers Education*, June 2000).

Industrial relations constitute one of the most complex and delicate problems of the modern capitalist industrial production process, which is characterized by rapid change and conflicting ideologies on national and international fora. The ideas, institutions and patterns of collective bargaining, which had shaped the philosophy of industrial relations in the past, are being felt as comparatively irrelevant in the context of new developments, new technology, and the changing socio-political and economic order emerging throughout the world in general and in the developing countries in particular (*Indian Labour Year Book*, 1999).

The present structure of Indian industrial relations draws its spirit from the concept of a welfare state. At the time of independence several labour laws were enacted to protect the workers from exploitation. Labour policy was directed initially towards maintaining harmony for ensuring the realization of the objectives of economic planning. To deal with industrial conflicts four types of institutions were created: (i) Interventionist labour laws; (ii) industrial democracy; (iii) code of conduct, moral as well as disciplinary; and (iv) consultation machinery. (Collective bargaining through bipartism and tripartism). Among all these, state intervention has played the dominant and significant role. Wherever conflicts arose between employees and employers, state came in to sort out problems. In this process the state introduced an array of regulations to protect the interests of industry as well as of workers (Ratnam, 1996).

In the wake of the New Economic Policy (NEP), the state is now trying to deregulate Indian industries in order to compete with multinationals. New technologies and structural and other adjustments seem to have made position of trade union much more vulnerable than any time in the past.

The growing flexibility of Indian industries has left unions with little membership and very little to do. This has weakened their power. In many sick public sector units, unable to compete in an open market system, trade unions have been compelled to adopt 'concession bargaining' for their many existence and survival. This is what is happening all over India and in Punjab too.

In this background an attempt has been made to understand the status and situation of labour and labour/industrial relations in Punjab. In the following pages some important aspects of labour and industrial relations, such as trade unionism and related aspects, industrial disputes and their causation and settlement machinery, composition of the labourforce, social security system and welfare schemes, problems and prospects of trade unionism, and the role of government, employers and trade unions and political leadership, will be discussed. In addition, efforts will also be made to look at the future of labour and industrial relations in Punjab.

Limitations of Data

- i) Data related to small industrial units and industrial disputes, involving less than ten workers resulting in work stoppage and lockouts, are not collected. In order to have a complete picture of the industrial relations scene at the state, as well as at the national level, it would be necessary to ensure collection and dissemination of requisite data on all the industrial disputes resulting in work-stoppages or lockouts.
- ii) The whole set of data disseminated by the State Labour Department and the National Labour Bureau largely relate to the organized sector. Industrial disputes resulting in work stoppages in the unorganized sector, therefore, mostly go unrepresented in the industrial relations picture.
- iii) Since the data are collected on a voluntary basis, some degree of non-response cannot be ruled out. The solution, however, does not lie in statutory submission of the requisite, but inadequate, statistics, but in strengthening the data collection machinery of the states, and also training those involved in the job of collection of labour-related information.

COMPOSITION OF THE LABOURFORCE IN PUNJAB

Punjab's economy is predominantly agricultural. However, over a period, its overall economy has undergone a structural transformation. The sectoral distribution of the workforce shows that in 1981, 58.02 per cent of the workforce of Punjab was engaged in agriculture. In 1991 (cultivators and agricultural labour), the percentage was 55.26 per cent and in 2001 it has declined to 39.4, which constitutes a marked shift in the workforce from the agricultural to the non-agricultural sector during this decade. One can call it a qualitative shift in the economy. This loss in the share of employment in the primary sector is due to the shift of the workforce to the secondary and tertiary sectors. The recent *Census on Punjab (2001)* reveals that the share of workers in the household industry has increased from 1.33 per cent in 1991 to 3.4 per cent in 2001. Clubbed data of manufacturing and others show that the in share in engaging workforce was 45.74 per cent in 1991 and 60.6 per cent in 2001. The shift from primary to the secondary and tertiary sectors is 14.86 per cent. This is a very significant change in the share of the workforce in different sectors. The domination of small-scale and unregistered tiny units in the industrial structure in Punjab is another significant feature of the economy.

According to the 1991 Census, only 12.98 per cent of the workers are employed in the organized sector of Punjab and the rest 87.02 per cent are in the unorganized sector, where labour laws are applied negligibly. In the light of this it is imperative to see how the life and livelihoods of those engaged in this unorganized sector can be made more secure against deprivation. The pattern of employment is also of low quality, as the majority of the workforce is employed as farm and construction workers and unskilled labourers in factories and elsewhere. (*White Paper on the State Finances, Government of Punjab, March, 2002*)

Migrant Labour

Migrant labour is another important component of the labourforce of Punjab, apart from local labour. However, according to the census reports of 1971, 1981, 1991, Punjab still is an out-migrating state. A major proportion of the migrant labourforce working in the industrial and agriculture sectors of Punjab hail from Uttar Pradesh, Bihar, Rajasthan

and Orissa. They are attracted to Punjab because of better employment opportunities and higher wages than in the states of their origin. Migrants are not only employed in agriculture and the industrial sector, but in other occupations too, such as building and road construction, brick making and rickshaw pulling, etc. Most of these migrants are males. It needs special mention that a large number of these migrants are permanent settlers in Punjab as a part of urban and rural settlements. Those who migrate seasonally and continue to shift their residence and remain in circulation are not recorded in the census data. Therefore, a large number of migrants remain unrecorded (*Draft Human Development Report, Punjab, 2001*).

Various persons, scholars, academics have made estimates of unrecorded migrants. For instance Avasthi (1997, 1-2) estimates that out of the 14.33 lakh agricultural labourforce about 2.5 lakh are migrant workers; 84,000 out of one lakh workers engaged in brick-kilns are migrant workmen; and in the construction sector out of 1.56 lakh workers nearly 1.10 lakh are migrants. Employment of inter-state migrants in the industrial sector too is substantial. Such migrants are estimated to number about six to seven lakh. This immigration has posed important issues not only for the socio-economic and political environment of the state, but also for settlement patterns, wage rates, single unit migration and above all the newly evolved forms of exploitation of in-migrants to Punjab from other backward states (Chand, 1998: 3). Thus, migrant labour plays a major role in the economic development of the state.

It has been perceived that migrant labour is placed lower than the local labour in terms of economic status and is also exploited. They meet with discrimination in terms of wage payment, hours of work, social behaviour and social security covers and social and basic amenities. It is also not true that the provisions of Inter-State Migrant Workmen's Act are being followed in Punjab and of Minimum Wage Act are being implemented, especially in the unorganized sector. As this situation has very serious implications for harmonious industrial relations in Punjab, it needs the immediate attention of the state government.

Child Labour

According to the census figures, there were 2,32,774 working children in Punjab in 1971, 2,16,939 in 1981 and 1,42,830 in 1991. Evidently there has been a tremendous decrease/decline in the number of working children in Punjab over the decade 1981-91. The decline is 34.16 per cent, which amounts to 3.42 per cent per annum. In Punjab, the proportion of working children to total children in the age group of 5-14 years, was 5.16 per cent during 1981 and 3.03 per cent during 1991 (Sharma, 2001:68-69).

Sex-wise distribution of child workers shows the predominance of males (86.70%). Data further reveal that the majority of main workers are male and females are marginal workers. According to the 1991 census, there were 1,20,520 children in rural areas and 22,310 in urban areas of Punjab, which shows that child labour is mainly prevalent in rural areas (85.62%). In rural areas child workers are engaged in the agricultural sector and allied activities (Sharma, 2001: 70-74). One can conclude that in Punjab child labour is predominantly confined to the agricultural sector followed by services and small-scale cottage industry.

In 1981, main child workers were 82.70 per cent of the total child workers and this proportion further rose to 93.96 per cent during 1991. This clearly shows that the percentage of marginal workers is very small and child labour in Punjab mainly comprise

of those children who work for the major part of the year and their main activity is confined to either cultivation as agricultural labourers, or in the household industry, or in some other jobs in the informal sector. If we compare this figure with the all-India figure it seems negligible, but as Punjab is a very prosperous state, it is a matter of great concern to the state. The labour department of Punjab Government in 1997 carried out a survey of 28,644 factories/shops and commercial establishments to find out cases of child labourers. A total number of 3,614 children were detected working in 1,681 establishments (*Child Labour Survey Report*, Department of Labour, Punjab, 1997).

The survey found a large number of children, i.e., 1,906, working in brick kilns, followed by 936 in hotels, restaurants, dhabas and tea stalls, 91 children were working in hazardous processes, defined by schedule 'A' or 'B' of Child Labour (Prohibition and Regulation) Act, 1986. The survey data further show that out of 3,614 children detected 2,802 were males and 812 female and 2,952 (81.68%) illiterate. Further information shows that 2,474 (68.45%) children detected were found to be working for a period ranging from 0 to 6 months. The majority of them 2,761 (75%) were working for more than six hours a day. Of the children detected 428 were getting up to Rs 200 per month, 1,334 from Rs. 200 to Rs. 500 and only 1,852 (48.75%) getting wages about Rs. 500 per month. The survey also much that most of the children found working were wards of migrant labourers. Locals were very few. Data also show district-wise concentration of child labour. Out of 3,614 child labourers detected by the survey, the maximum number (932) in Amritsar, followed by Kapurthala (769), Jalandhar (384), Hoshiarpur (347), Patiala (211) and Ludhiana (144), (*Child Labour Survey Report*, Department of Labour, Punjab, 1997).

Poverty, till date, has been identified as the single largest reason for child labour. Although the magnitude of absolute poverty is relatively less than in many other states, relative poverty exists in Punjab. This has contributed to the existence of a sizable child labourforce. In most of the cases children contribute to augmenting the family income. Besides the Scheduled Castes and Backward Castes of the state, migrant labour from Bihar, Uttar Pradesh, Orissa and other states have also contributed in aggravating the problem of child labourers in Punjab as the all send their children to work as child labourer to enhance their income.

Employers not only take advantage of their vulnerable position by paying less wages. They have also pushed them to hazardous work. Employers find that the advantage of employing children is that they do not go on strike and disrupt production. They are also the easiest to dislodge at times of economic difficulties. Children are the cheapest to hire and easiest to fire as they do not resist. They can be made to work in poor working conditions on a very low wage rate. Since it affects industrial relations, they should intervene urgently to insure that the children of disadvantaged sections and properly looked after to become a high quality human resource for the development of the society.

TRADE UNIONISM IN PUNJAB

The growth of trade unionism in Punjab is part of the history of Indian trade union movement. Before 1947, there was not much trade union activity in Punjab. There were only four trade unions, up to 1919-20. These were affiliated to the AITUC, as mentioned by Mathur and Mathur (1957.17-18). There also existed another five unions sympathetic to the AITUC, which had a very brief existence. It was only during 1930-40 that the

number of trade unions in Punjab rose to 65, with a membership of 11,051, which however, declined to 22 in 1944-45.

After independence, the trade union movement in Punjab got an impetus from different political parties. The green revolution triggered a great deal of agricultural and industrial development in the state. Consequently, there was an increase in employment in the industrial sector. This gave new life to the trade union movement in Punjab. Many factors common to Indian trade unionism have influenced and facilitated its growth in the state. An attempt has been made here to understand the status of trade unionism in reorganized Punjab since 1966. Various indicators which have affected the growth of trade unionism have been analysed and discussed with the help of available statistics.

Growth of Trade Unions in Punjab

Punjab, unlike other states, shows a declining trend in the density of unionization as, measured by the ratio of membership per union. This is understandable, because industrialization of Punjab is still based largely on small firms. The number of registered trade unions in the state increased more than four-fold from 536 in 1968 to 2,297 in 1999 (Table 25). The number of unions submitting returns is very low. A similar tendency has been observed at the national level too (Ratnam, 1996: 3). There are only 523 unions (22.77%) submitting returns as against 2,297 registered unions registered in 1999. According to available data, there has been a 52 per cent increase in the index number of unions submitting returns between 1968 and 1999, but the response rate has sharply declined from 64 per cent to 23 per cent. This is indicative of the failure of the government to make the unions file their returns regularly, although it is a statutory obligation. It also reflects the irresponsible and casual approach of the management of the trade unions. In view of only a 23 per cent (in 1999) response rate it would not be safe to conclude that the average membership per union has increased from 257 to 1,035, as revealed in Table 25.

Table 25
Trade Unions in Punjab (1968 to 99)

Year	Total No. of registered unions	Index of registered unions (1968 = 100)	No. of unions submitting returns	Index of unions submitting returns (1968 = 100)	Membership of unions submitting returns	Index of membership (1968 = 100)	Response rate	Average membership of unions submitting returns
1968	536	100.00	344	100	88413	100.00	64.18	257
1969	592	110.45	323	93.89	89681	101.43	54.56	278
1970	624	116.42	379	110.17	119200	134.82	60.74	315
1971	476	88.81	365	106.10	125187	141.59	76.68	343
1972	543	101.30	389	113.08	157691	178.35	71.64	405
1973	624	116.42	412	119.76	203686	230.38	66.03	494
1974	678	126.49	433	245.63	212259	240.07	63.86	490
1975	731	136.38	464	134.88	205877	232.85	73.53	444
1976	751	140.41	410	119.18	223865	253.20	54.59	546
1977	815	152.05	399	115.98	206736	233.82	48.96	518
1978	887	165.48	409	118.89	232732	263.23	46.11	569
1979	986	183.95	470	136.62	279300	315.90	47.67	594
1980	1070	199.62	409	118.89	225592	255.15	38.22	552
1981	1169	218.09	462	134.30	310189	350.84	39.52	671
1982	1173	218.84	473	137.50	346049	391.40	40.32	732
1983	1218	227.24	469	136.33	333628	377.35	38.51	711
1984	1292	241.04	416	120.93	275037	311.08	32.20	661
1985	1376	256.72	457	132.84	316888	358.41	33.21	693
1986	1429	266.60	491	142.73	341766	386.55	34.36	696
1987	1512	282.09	484	140.69	316297	357.74	32.01	654
1988	1635	305.04	456	132.55	393863	445.48	27.89	864
1989	1745	325.56	507	147.38	446040	504.49	29.05	880
1990	1851	345.33	467	135.75	385761	436.31	25.23	826
1991	1806	336.94	477	136.68	397984	450.14	26.41	834
1992	1876	350.00	415	120.63	347729	393.30	22.12	838
1993	1927	359.51	407	118.31	393970	445.60	21.12	968
1994	2004	373.88	467	135.26	494596	559.38	23.30	1059
1995	2075	387.13	417	121.22	431629	488.20	20.10	1035
1996	2097	391.23	446	129.65	445399	503.77	21.27	998
1997	2158	402.61	426	123.84	443487	501.61	19.74	1041
1998	2226	415.30	499	145.06	459503	519.72	22.42	921
1999	2297	428.54	523	152.03	660226	746.75	22.77	1262

- Sources:**
1. Office of the Labour Commissioner, Punjab, Chandigarh.
 2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh.

Note:

1. Response rate = $\frac{\text{No. of union submitting returns}}{\text{Total No. of registered unions}} \times 100$

Membership of Trade Unions

The data only of unions submitting returns reveal a declining trend with small membership. Clubbing the data into three categories, according to membership size, i.e., 0-499, 500 to 1,999 and 2,000 and above, at four points of time, i.e., 1968, 1981, 1991 and 1999, shows that the percentage of small and medium size unions has decreased and those with a large membership has increased over 1968 to 1999 (Table 26). It has been observed that the share of unions with less than 500 members has continuously declined from 45.42 per cent in 1968 to 15.64 per cent in 1981 to 13.70 per cent in 1991 and to 9.18 per cent in 1999. This is also true of unions with a membership of less than 2,000, whose share has fallen substantially from 38.50 per cent in 1968 to 30.13 per cent in 1981 to 20.24 per cent in 1991 and to 13.14 per cent in 1999. Unions with a membership of more than 2,000, have increased their share from 16 per cent in 1968 to 54.24 per cent in 1981 to 66.07 per cent in 1991 and to 77.68 per cent in 1999. It can possibly be concluded that workers must have realized that their strength lies only in their numbers. At the national level too, the degree of unionization is very high in the public sector with its large employment, while it is much less in small and medium units, particularly in the private sector (Ratnam, 1996: 4). It can, therefore, be concluded that, since Punjab has a large number of small-scale industries, the role of trade unions as such has not been as much in evidence as it might have been with large industries.

Income and Expenditure of Trade Unions

Adequate financial resources are a necessary condition for a union to be effective and independent. Table 27 shows that the financial status of unions in Punjab is comfortable. The average income has increased 17 times during 1968 and 1999, and the average expenditure 16 times. Another indication of the sound financial condition of the unions is the substantial closing balance in their accounts. This means that they are not short of funds for undertaking trade union activities. But unions in small units always face a financial crunch.

Trade Unions' Affiliation with Central Federations

Indian unions are fragmented on the basis of ideological and other factional considerations and of caste and regional differences and also centred on personalities. (ILO, 1992). According to several studies, apart from low membership coverage and fragmentation, there has been a decline in membership and growing alienation between trade unions and members (Ramaswamy, 1998). In Punjab, mainly five central federations of trade unions, namely, the INTUC, AITUC, Bhartiya Mazdoor Sangh (BMS), Centre of Indian Trade Unions (CITU) and the Hind Mazdoor Sabha (HMS) are active among industrial workers, as evident from Table 28. However, a substantial number of unions in Punjab are not affiliated to any of these federations and operate independently. The table shows a growing tendency to seek affiliation with federations. This is also indicative of increase in politicization of trade unions. In 1968, 42.44 per cent of the trade unions, with 30.33 per cent of the total membership of unions, fell into the category of non-affiliated or independent unions. The percentage of unions in this category has declined continuously from 43.01 in 1970 to 29.87 in 1981 to 23.69 in 1991 and to 16.82 in 1999. Their membership too has decreased, though to a relatively lesser degree.

Table 26
Trade Unions in Punjab - Size-wise Distribution (1968-99)

Year	Less than 50			50-99			100-299			300-499			500-999			1000-1999			2000-4999			5000-9999			10000 & above			Total		
	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	%	No.	Mem.	
1968	91	2312	2.62	71	4439	5.02	103	19843	22.44	36	13561	15.34	26	17716	20.04	13	16319	18.46	3	7944	8.98	1	6279	7.10	0	0	0	0	344	88413
1969	78	2228	2.48	69	4797	5.35	88	15559	17.35	43	15128	16.87	26	18534	20.67	16	21685	24.18	2	4930	5.50	1	6820	7.60	0	0	0	0	323	89681
1970	102	2832	2.38	68	4685	3.93	118	19954	16.74	39	14705	12.34	27	18305	15.36	18	25052	21.02	5	19933	16.72	2	13734	11.52	0	0	0	379	119200	
1971	87	2338	1.87	72	5208	4.16	114	18153	14.50	39	15080	12.05	24	14690	11.73	21	28796	23.00	5	17522	14.00	3	23400	18.69	0	0	0	365	125187	
1972	95	2827	1.79	68	4886	3.10	120	20695	13.12	40	15425	9.78	35	22675	14.38	19	27249	17.28	7	24256	15.38	5	39718	25.18	0	0	0	389	157731	
1973	84	2554	1.26	77	5032	2.47	128	21785	10.71	38	14690	7.22	46	29332	14.42	23	31903	15.69	7	20362	10.01	9	77726	38.22	0	0	0	412	203384	
1974	76	2150	1.07	88	6264	3.11	141	24126	11.96	38	14670	7.28	47	29770	14.76	24	35496	17.60	6	19546	9.69	9	69620	34.53	0	0	0	429	201642	
1975	82	2450	1.19	94	6640	3.22	155	27047	13.14	37	14077	6.84	55	33748	16.39	23	33045	16.05	11	30387	14.76	7	58483	28.41	0	0	0	464	205877	
1976	74	2167	0.97	88	6232	2.78	121	20901	9.34	38	14412	6.44	48	30081	13.44	24	35371	15.80	7	22324	9.97	10	92377	41.26	0	0	0	410	223865	
1977	71	2071	1.00	83	5823	2.82	116	20441	9.89	39	14693	7.11	44	28382	13.73	28	38343	18.55	9	24599	11.90	9	72384	35.01	0	0	0	399	206736	
1978	74	2131	0.92	72	4911	2.11	115	20418	8.77	43	15728	6.76	57	36761	15.80	25	35937	15.44	13	33476	14.38	10	83370	35.82	0	0	0	409	232732	
1979	77	2234	0.80	82	5851	2.09	145	24762	8.87	47	17126	6.13	66	44935	16.09	24	33625	12.04	18	48764	17.46	11	101967	36.51	0	0	0	470	279264	
1980	70	2256	1.00	63	4629	2.05	117	23725	10.52	49	18929	8.39	65	46816	20.75	22	31579	14.00	17	46228	20.49	6	51430	22.80	0	0	0	409	225592	
1981	71	2176	0.70	76	5394	1.74	133	24029	7.75	46	16896	5.45	72	49648	16.01	31	43806	14.12	25	75865	24.46	3	20191	6.51	5	72180	23.27	462	310185	
1982	73	2230	0.64	71	4972	1.44	78	10534	3.04	108	32311	9.34	72	48873	14.12	32	45316	13.09	27	78293	22.62	7	48626	14.05	5	74894	21.64	473	346049	
1983	77	2430	0.73	76	5039	1.51	75	10566	3.17	110	31678	9.50	57	33222	9.96	33	43762	13.12	27	73906	22.15	7	55574	16.66	7	77451	23.21	469	333628	
1984	77	2488	0.90	56	3937	1.43	141	24650	8.96	36	13356	4.86	45	30919	11.24	25	32363	11.76	26	72632	26.41	6	36034	13.10	4	58658	21.33	416	275037	
1985	62	1941	0.61	81	5615	1.77	135	23732	7.49	50	17173	5.42	64	43637	13.77	28	38966	12.30	25	72475	22.87	8	57015	17.99	4	56334	17.78	457	316888	
1986	67	1994	0.58	88	6780	1.98	153	27542	8.06	49	17534	5.13	67	45649	13.36	24	35431	10.37	27	79847	23.36	12	75299	22.03	4	51690	15.12	491	341766	
1987	70	2177	0.69	91	5845	1.85	144	25279	7.99	49	18293	5.78	61	41856	13.23	32	42529	13.45	25	75782	23.96	7	45423	14.36	5	59113	18.69	484	316297	
1988	60	1685	0.43	74	4609	1.17	141	21387	5.43	42	13479	3.42	55	31893	8.10	32	34948	8.87	30	105765	26.85	15	96191	24.42	7	83906	21.30	456	393863	
1989	76	2407	0.54	74	5297	1.19	157	28461	6.38	50	18909	4.24	61	39568	8.87	40	51713	11.59	30	100997	20.64	13	86935	19.49	6	111753	25.05	507	446040	
1990	58	1945	0.50	66	4592	1.19	145	25430	6.59	58	23189	6.01	71	48372	12.54	25	33540	8.69	29	96051	24.90	10	73570	19.07	5	79072	20.50	467	385761	
1991	53	1677	0.42	77	5292	1.33	147	25176	6.33	59	22360	5.62	73	48113	12.09	24	32421	8.15	28	85775	21.55	10	68688	17.26	6	108482	27.26	477	397984	
1992	56	1780	0.51	68	4713	1.36	111	19426	5.59	60	22110	6.36	66	45114	12.98	18	25272	7.27	27	87168	25.07	4	27382	7.87	5	114734	32.99	415	347729	
1993	54	1557	0.40	61	4244	1.08	115	20224	5.13	54	19907	5.05	60	40841	10.37	20	29135	7.39	30	97997	24.87	8	54482	13.83	5	125583	31.88	407	393970	
1994	60	1923	0.39	67	4652	0.94	140	25492	5.15	58	21711	4.39	65	42533	8.60	34	46486	9.40	26	87537	17.70	11	65193	13.18	6	199069	40.25	467	494596	
1995	59	1805	0.42	70	4915	1.14	120	21455	4.97	54	20362	4.72	49	34535	8.00	24	32299	7.48	25	82426	19.10	10	58093	13.46	6	175739	40.71	417	431629	
1996	56	1778	0.40	81	5465	1.23	134	24322	5.46	46	18547	4.16	61	43881	9.85	28	39468	8.86	27	93955	21.09	7	43460	9.76	6	174523	39.18	446	445399	
1997	57	1818	0.40	70	4957	1.12	125	22690	5.12	53	20855	4.70	48	33942	7.65	28	40120	9.05	31	108759	24.52	7	48428	10.92	7	161918	36.51	426	443487	
1998	59	1890	0.41	73	5158	1.12	138	24323	5.29	51	19353	4.21	54	36848	8.02	29	40119	8.73	29	99651	21.69	10	59178	12.88	6	172983	37.64	449	459503	
1999	60	1936	0.29	69	4858	0.74	174	29254	4.43	64	24573	3.72	62	41964	6.36	31	44791	6.78	40	133416	20.21	13	83964	12.72	10	295470	44.75	523	660226	

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh.

2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh.

Note: 1. The data relate only to trade unions, which submit their returns. 2. No. = Number of unions; 3. Mem. = Membership of the unions; 4. % = Percentage of membership in relations to total trade union membership.

Table 27
Income and Expenditure of Trade Unions in Punjab (1968-99)

Year	Opening balance (Rs.)	Index of opening balance (1968=100)	Income (Rs.)	Index of income (1968=100)	Expend. (Rs.)	Index of expend. (1968=100)	Closing balance (Rs.)	Index of closing balance (1968=100)	Average income per union (Rs.)	Average expend. per union (Rs.)
1968	268431	100	437314	100	416137	100	289608	100	1271	1210
1969	252439	94	613927	140	515091	124	351275	121	1901	1595
1970	233905	87	1281936	293	1127343	271	384494	133	3419	3006
1971	360338	134	1643624	376	1494741	359	509221	176	4503	4095
1972	505051	188	1633751	374	1608910	387	529892	321	4200	4136
1973	653353	243	1334031	305	1117599	269	869785	300	3238	2712
1974	838607	312	1354367	310	1387924	334	805050	278	3157	3235
1975	985665	367	1751540	401	1561739	375	1175466	406	3775	3369
1976	1283544	478	1442728	330	1359108	327	1367164	472	3519	3315
1977	777037	289	1356362	310	1202051	289	931348	322	3399	3013
1978	890764	332	1592578	364	1464356	352	1018986	352	3894	3580
1979	1470743	548	2145087	491	1789026	430	1826804	631	4564	3806
1980	1081215	403	1873295	428	1620890	390	1333620	460	4580	3963
1981	1906413	710	2997723	685	2448912	588	2455224	848	6489	5301
1982	3046297	1135	3766271	861	3406582	819	3405986	1176	7962	7202
1983	1431781	533	3465839	793	2973966	707	1953654	675	7390	6277
1984	3073447	1145	2879923	659	2556244	614	3397126	1173	6923	6145
1985	1374530	512	4531405	1036	4524707	1087	1381228	477	9916	9901
1986	3026907	1128	5000546	1143	5118882	1230	3208571	1108	10184	10425
1987	2246462	837	4058919	928	4097068	985	2208313	763	8386	8465
1988	5776792	2152	5592285	1279	8769187	2107	2599890	898	12264	19231
1989	1302825	485	5389284	1232	4349256	1045	4342853	1500	10630	8578
1990	1590213	592	6104149	1396	5992950	1440	1701412	587	13071	12833
1991	1556497	580	6411371	1466	5960249	1432	2007619	693	13441	12495
1992	2975062	1108	6868798	1571	6787739	1631	3057021	1056	16551	16356
1993	3328272	1240	4718853	1079	5134667	1234	2912458	1006	11594	12616
1994	4130956	1538	7826306	1790	7553413	1815	4403849	1521	16759	16174
1995	4557039	1693	7790043	1781	6713394	1613	5635688	1946	18681	16099
1996	4059545	1512	8800552	2014	6603845	1587	6256252	2160	19732	14807
1997	8190443	3051	16318209	2359	10754801	2584	13753851	4749	38306	25246
1998	5656146	2107	10263040	2347	7527765	1809	8391421	2897	20567	15086
1999	4814069	1793	11598305	2652	10349526	2487	6062848	2093	22176	19789

Sources:

1. Office of the Labour Commissioner, Punjab, Chandigarh.

2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh.

Notes:

1. The information regarding income and expenditure is based on returns received from registered trade unions.

2. Expend. = Expenditure.

Table 28
Affiliations of Trade Unions in Punjab with Central Federations (1968-99)

Year	INTUC				AITUC				BMS				CITU				HMS				PMF				Others				Total						
	No.	%	Mem.	%	No.	%	Mem.	%	No.	%	Mem.	%	No.	%	Mem.	%	No.	%	Mem.	%	No.	%	Mem.	%	No.	%	Mem.	%	No.	Mem.					
1968	84	24.42	19905	22.5	49	14.24	21151	23.92	62	18.02	19631	22.20	0	0	0	0	3	0.87	914	1.03	-	-	-	-	-	-	-	-	-	146	42.44	26812	30.33	344	88413
1969	42	13.00	16197	18.06	51	15.79	18223	20.32	87	26.93	31040	34.61	0	0	0	0	3	0.92	1154	1.29	-	-	-	-	-	-	-	-	140	43.34	23067	25.72	323	89681	
1970	64	17.20	20593	17.28	40	10.75	20888	17.53	91	24.46	36675	30.78	12	3.23	5020	4.21	5	1.34	1339	1.12	-	-	-	-	-	-	-	-	160	43.01	34633	29.07	372	119148	
1971	57	15.62	29083	23.23	44	12.05	23592	18.85	99	27.12	36514	29.17	10	2.74	3135	2.50	4	1.10	1040	0.83	-	-	-	-	-	-	-	-	151	41.37	31823	25.42	365	125187	
1972	80	20.56	52038	32.99	45	11.57	22192	14.07	110	28.28	45320	28.73	13	3.34	5702	3.61	1	0.26	245	0.16	-	-	-	-	-	-	-	-	140	35.99	32234	20.44	389	157731	
1973	92	22.33	70545	34.63	45	10.92	24270	11.92	126	30.58	63989	31.42	10	2.43	4200	2.06	5	1.21	1706	0.84	-	-	-	-	-	-	-	-	134	32.52	38976	19.14	412	203686	
1974	95	21.93	68991	33.61	50	11.55	22443	10.93	124	28.64	68468	63.36	13	3.00	4713	2.30	7	1.62	2526	1.23	-	-	-	-	-	-	-	-	144	33.26	38118	18.57	433	205259	
1975	111	23.92	75310	36.58	51	10.99	25434	12.35	130	28.02	69071	33.55	15	3.23	4836	2.35	5	1.08	1924	0.93	-	-	-	-	-	-	-	-	152	32.76	29302	14.23	464	205877	
1976	85	20.00	88430	39.50	44	10.77	42019	18.77	121	29.44	60864	27.19	15	3.65	3990	1.78	4	0.97	1752	0.78	3	0.73	1343	0.60	139	33.81	25467	11.38	411	223865					
1977	61	15.29	59378	28.79	47	11.78	39020	18.92	125	31.33	60161	32.08	16	4.01	8151	3.95	6	1.50	2297	1.12	6	1.50	1423	0.68	138	34.59	29806	14.46	399	206236					
1978	46	11.25	61245	26.31	45	11.00	37405	16.07	137	33.50	78876	33.89	24	5.87	11885	5.11	14	3.42	5178	2.22	6	1.47	3798	1.63	137	33.50	34345	14.76	409	232732					
1979	69	14.68	69709	24.96	42	8.94	24817	8.89	141	30.00	86752	31.06	30	6.38	17319	6.20	13	2.77	4602	1.67	4	0.85	1104	0.40	171	36.38	749637	26.83	470	279300					
1980	60	14.67	49580	21.98	34	8.31	10995	4.87	161	39.36	98140	43.50	27	6.60	15786	7.00	10	2.44	4240	1.88	1	0.24	750	0.33	116	28.36	46100	20.44	409	225591					
1981	73	15.80	97919	32.19	41	8.87	30847	10.14	159	34.42	91715	30.15	43	9.31	26854	8.83	7	1.52	7075	2.33	1	0.22	865	0.28	138	29.87	48914	16.08	462	304189					
1982	74	15.64	93524	27.03	64	13.53	46504	13.44	137	28.96	89897	25.98	45	9.51	30324	8.76	8	1.69	7897	2.28	1	0.21	867	0.25	144	30.44	77039	22.26	473	346052					
1983	83	17.70	77977	23.37	59	12.58	53528	16.04	165	35.18	95890	28.74	47	10.02	30146	9.04	10	2.13	8908	2.67	1	0.21	750	0.22	104	22.17	66429	19.91	469	333628					
1984	40	9.62	39177	14.24	61	14.66	36688	13.34	143	34.38	93308	33.93	46	11.06	22022	8.01	12	2.88	16499	6.00	3	0.72	1353	0.49	111	26.68	65993	23.99	416	275040					
1985	48	10.50	43975	13.88	76	16.63	45375	14.32	148	32.38	98012	30.93	51	11.16	27883	8.80	12	2.63	19375	6.11	3	0.66	1390	0.44	119	26.04	80878	25.52	457	316888					
1986	66	13.44	48478	14.18	83	16.90	59237	17.33	172	35.03	123025	36.00	31	6.31	16723	4.89	9	1.83	9198	2.69	4	0.81	2079	0.61	126	25.66	83026	24.29	491	341766					
1987	44	9.09	26180	8.28	84	17.36	60616	19.16	166	34.30	21755	38.49	55	11.36	31266	9.89	6	1.24	2889	0.91	4	0.83	2591	0.82	125	25.83	71000	22.45	484	316297					
1988	44	9.64	27509	6.98	53	11.62	45179	11.47	167	36.62	136566	34.67	65	14.25	55835	14.18	10	2.19	15623	3.97	1	0.22	1094	0.28	116	25.44	112057	28.45	456	393863					
1989	72	14.20	62590	14.03	78	15.38	41734	9.36	191	37.67	157381	35.28	54	10.65	54179	12.15	9	1.78	18414	4.13	2	0.39	2641	0.59	101	19.92	109101	24.46	507	446040					
1990	41	8.78	17127	4.44	74	15.85	52088	13.50	179	38.33	139462	36.15	50	10.75	16784	4.35	11	2.36	18490	4.79	3	0.64	2292	0.59	109	23.34	139591	36.18	467	385834					
1991	65	13.63	65963	16.57	75	15.72	62796	15.78	172	36.05	144578	36.33	39	8.18	30992	7.79	10	2.10	9852	2.48	3	0.63	2989	0.75	113	23.69	80814	20.31	477	397984					
1992	38	9.16	16943	4.87	56	13.49	36250	10.42	164	39.52	118095	33.96	49	11.81	46386	13.34	6	1.45	40326	11.60	5	1.20	1738	0.50	97	23.37	87991	25.30	415	347729					
1993	42	10.27	24641	6.25	63	15.40	59767	15.17	177	43.28	124898	31.70	13	3.18	33654	8.54	5	1.22	47620	12.09	5	1.22	1355	0.34	104	25.43	102035	25.90	409	393970					
1994	66	14.13	80614	16.30	75	16.06	127626	25.80	174	37.26	132824	26.86	34	7.28	36007	7.28	10	2.14	36657	7.41	1	0.21	1421	0.29	107	22.91	79447	16.06	467	494596					
1995	32	7.67	19992	4.63	76	18.23	131902	30.56	194	46.52	127924	29.64	23	5.52	27759	6.43	9	2.16	34513	8.00	1	0.24	836	0.19	82	19.66	88703	20.55	417	431629					
1996	29	6.50	17749	3.92	74	16.59	137156	30.79	199	44.61	123158	27.65	46	10.31	34356	7.71	7	1.60	32436	7.28	2	0.83	1485	0.33	89	19.56	99059	22.24	446	445399					
1997	30	7.04	13643	3.08	64	15.02	123967	27.95	196	46.09	148148	33.40	37	8.69	27668	6.24	10	2.34	28476	6.42	2	0.89	1591	0.35	87	20.42	99994	22.54	426	443487					
1998	29	6.46	8594	1.87	66	14.69	122747	26.71	233	51.89	201349	43.82	33	7.35	37893	8.25	6	1.33	6254	1.36	2	0.45	1491	0.32	80	17.81	81175	17.66	449	459503					
1999	93	17.78	139774	21.17	68	13.00	125876	19.06	232	44.36	209838	31.78	27	5.16	39782	6.03	12	2.29	41915	6.35	3	0.57	1482	0.24	88	16.82	101557	15.38	523	660226					

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh.

2. E.S.O., Various Issues of Statistical Abstract, Punjab, Chandigarh.

Notes: 1. No. = Number of unions submitting returns

2. Mem. = Membership of unions submitting returns

The position of INTUC was the best among the federations, in 1968. It had the maximum number of affiliated unions (24.42%), followed by BMS (18.02%) and AITUC (14.24%). The position of INTUC has declined sharply to 6.46 per cent in 1998. The position of AITUC too deteriorated after 1970, but since 1984 onwards it has been able to register gradual improvement, reporting affiliation of 18.23 per cent of the total unions, with the highest membership of 30.79 per cent in 1996. BMS overtook INTUC in 1969 and started gaining ground continuously and has established a substantial lead. In 1998, BMS had the affiliation of little more than half (51.89%) of the unions in Punjab.

The membership of INTUC kept rising till 1983, but started declining thereafter and came down to 1.87 per cent in 1998. On the other hand, AITUC, which had been losing membership up to 1993, suddenly improved its position in 1994, 1995 and 1996 and claimed the highest percentage of union membership, i.e., 30.79 per cent, followed by BMS (26.65%), HMS (7.28%) and INTUC (3.92%). CITU, beginning in 1970, had been gaining till 1988 in the share of both affiliated unions and membership, but seems to have lost favour since. In 1988, it had 14.18 per cent of the total membership of the unions filing their returns, which came down to 6.03 per cent in 1999. HMS too has gradually improved its position. The Punjab Mazdoor Dal (PMD) has become almost redundant in the state.

INDUSTRIAL DISPUTES, THEIR CAUSES AND RESOLUTION

A systematic enquiry into the trends of industrial unrest, along with causes and consequences, would be immensely useful for framing further strategies, policies and programmes for bringing about harmony in industrial relations in the state.

Industrial Disputes in Punjab

Between 1968 and 1999 the index number of industrial disputes rose from 100 to 441, with the exception of 1990 when it rose to 567. The index number of work stoppages, which had gone up to 393 in 1979 has since declined to 71 in 1999. The index of workers involved in work stoppages has shown an uneven trend. While it came down to 39 in 1974, it rose to 1,037 in 1989 and was down to 98 in 1999 (Table 29). This indicates a declining tendency among workers to participate in work stoppages. The index of mandays lost has far exceeded that of industrial disputes. During 1968 to 1999, the index number of disputes leading to work stoppages declined to only 71 per cent. The index number of mandays lost, however, increased nine-fold. This is because the average number of workers per work stoppages has increased a great deal. This shows a qualitative shift in the nature of industrial disputes. The number of mandays lost per work stoppage has increased substantially, i.e., work stoppages last longer, from several days to even weeks. This is a very disturbing trend, as compared to the period until about the mid-1970s, when work stoppages lasted only a few hours or days. It also means that the production resources and capacities installed in the mills are not being optimally utilized. This should be a matter of concern for those involved in corporate governance and state administration.

Table 29
Industrial Disputes in Punjab (1968 - 99)

Year	No. of disputes raised	Index of disputes raised (1968 =100)	No. of work stoppages	Index of work stoppages (1968=100)	No. of workers involved in work stoppages	Index of workers involved (1968=100)	No. of mandays lost in work stoppages	Index of mandays lost (1968=100)	Estimated number of workers employed in working factories	Index of workers employed (1968=100)
1968	1981	100	28	100	11579	100	62375	100	104307	100
1969	2340	118	23	82	5664	49	100278	161	105924	102
1970	3514	177	22	79	38067	329	104161	167	116806	112
1971	3094	156	15	54	32602	282	158867	255	118503	114
1972	3574	180	30	107	7083	61	107533	172	118657	114
1973	4432	224	55	196	6559	57	81837	131	127451	122
1974	4254	215	24	86	4513	39	69285	111	131100	126
1975	4932	249	21	75	10536	91	90332	145	136325	131
1976	6461	324	33	118	7714	67	37961	61	144359	138
1977	5430	274	57	204	28867	249	278516	447	156817	150
1978	5987	302	94	336	21952	190	211052	338	168072	161
1979	6802	343	110	393	20848	180	357690	573	188098	180
1980	7830	395	89	318	35499	307	291477	467	201735	193
1981	8072	407	89	318	25879	223	244609	392	208732	200
1982	7975	404	76	271	34893	301	799293	1281	239198	229
1983	8989	454	71	254	13604	117	228447	366	243008	233
1984	8217	415	38	136	26530	229	177535	285	273932	263
1985	8908	450	46	164	28086	243	173018	277	282214	271
1986	8686	438	56	200	49109	424	643088	1031	298503	286
1987	8895	449	50	179	20764	179	295727	474	326722	313
1988	9922	501	44	157	21410	185	271100	435	336050	322
1989	10091	509	52	186	120049	1037	600784	963	345145	331
1990	11237	567	69	246	44038	380	303656	487	367513	352
1991	10012	505	45	161	59318	512	294286	472	383798	368
1992	7700	389	29	104	32131	277	230177	369	394979	379
1993	7618	385	42	150	15673	135	300556	482	405223	388
1994	7654	386	28	100	21031	182	260555	418	417998	401
1995	7404	374	22	79	12610	109	521963	837	431729	414
1996	7820	395	23	82	25855	223	364648	584	445004	427
1997	8211	414	28	100	6075	52	105784	169	441357	423
1998	8668	438	23	82	18053	156	784317	1257	449059	431
1999	8727	441	20	71	11372	98	559128	896	446953	428

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh. 2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh

Disputes Raised by Central Federations of Trade Unions

Table 30 reveals that AITUC has sponsored the largest percentage of industrial disputes in Punjab, though other federations, as well as unaffiliated unions, have also become increasingly active in raising disputes. This trend has been evident since 1976. It is clear from Table 30 that as an organization, they raised 45 per cent of the disputes in 1999. Among the federations, AITUC raised the maximum number of disputes, averaging 25 per cent, followed by INTUC, CITU, BMS, HMS and PMD in that order. This shows that unions with a left ideology or those working independently (category of others) are more active in taking up issues of the workers than INTUC, BMS and HMS, etc.

Causes of Work Stoppages

Stoppage means a temporary stoppage of activity in a unit, as a result of which the persons employed in it are forced to remain away from their usual duties. Such a work stoppage may be due to an industrial dispute or for other reasons, viz., financial stringency, strategic considerations, breakdown of machinery, natural calamities, accumulation of stocks, lack of demand, shortage of raw materials or electricity, power and coal, and legal disputes, etc. Work stoppage due to industrial dispute may be the result of a strike or a lockout.

Table 31 shows that causes of work stoppages have undergone change since 1968. Economic causes, viz., wages and allowances and bonus continue to remain the most important issues of industrial disputes in Punjab. These accounted for 75 per cent of the work stoppages in 1968, 62.22 per cent in 1991 and 40 per cent in 1999. The table shows that work stoppages, especially on account of wages and allowances, have sharply declined from 67.68 per cent in 1968 to 44.44 per cent in 1991 to 25 per cent in 1999. Work stoppages for bonus have substantially increased from 7.14 per cent in 1968 to 36.36 per cent in 1995. However, there are not that important now. Individual issues, such as suspension and termination have gained sharply in importance. Their share in work stoppages have increased from 3.57 per cent in 1968 to 20 per cent in 1999. This underlines the increasing concern of the workers and trade unions for protecting their employment, because of growing unemployment all over the country. Leave and holidays are the least important causes for work stoppages, while retrenchment and indiscipline and violence have led to substantial work stoppages in different years during 1968 to 1999. The total number of work stoppages in Punjab were 28 in 1968, reached a peak of 110 in 1979 and declined thereafter to 20 in 1999.

Dispute Resolution

The existing machinery for the settlement of industrial disputes consists of conciliation, adjudication and arbitration. Faith in the conciliation machinery has been significantly eroded between 1969 and 1999 as shown in Table 32. In 1969, it was used for the settlement of 27.54 per cent of the disputes. In 1999, its use had declined to only 7.87 per cent. During 1969 to 1999, on an average, 25 per cent of the disputes were

Table 30
Disputes Raised by Central Federations of Trade Unions in Punjab (1968-99)

Year	INTUC		AITUC		BMS		HMS		CITU		PMD		HMP & Others		TOTAL
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1968	269	13.58	1253	63.75	92	4.64	27	1.36	-	-	-	-	340	17.16	1981
1969	247	10.55	1313	56.11	222	9.49	41	1.75	-	-	-	-	517	22.09	2340
1970	147	4.74	1766	56.99	356	11.49	8	0.26	-	-	-	-	822	26.52	3099
1971	115	3.72	1323	42.76	401	12.96	8	0.26	219	7.08	-	-	1028	33.23	3094
1972	228	6.38	1525	42.67	431	12.06	28	0.78	411	11.50	-	-	951	26.61	3574
1973	521	11.75	1267	28.59	479	10.81	194	4.38	569	12.84	-	-	1402	31.63	4432
1974	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	-	-	N.A.	N.A.	N.A.
1975	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	-	-	N.A.	N.A.	N.A.
1976	876	13.66	1644	25.64	494	7.71	317	4.94	720	11.23	-	-	2360	36.81	6411
1977	951	17.51	1537	28.31	528	9.72	240	4.42	561	10.33	-	-	1613	29.71	5430
1978	758	12.66	1857	31.01	626	10.46	275	4.59	809	13.51	-	-	1662	27.76	5987
1979	784	11.52	2285	33.59	407	5.98	305	4.48	1080	15.88	-	-	1941	28.54	6802
1980	970	12.39	2370	30.27	763	9.74	445	5.68	827	10.56	159	2.03	2296	29.32	7830
1981	1755	21.74	2455	30.41	739	9.16	551	6.83	948	11.74	94	1.16	1530	18.95	8072
1982	1604	20.06	2916	36.47	819	10.24	331	4.14	831	10.39	80	1.00	1414	17.69	7995
1983	1546	17.20	2838	31.57	816	9.08	265	2.95	1141	12.69	96	1.07	2287	25.44	8989
1984	1335	16.25	2503	30.46	962	11.71	157	1.91	651	7.92	51	0.62	2558	31.13	8217
1985	1531	17.18	2382	26.73	890	9.99	460	5.16	804	9.02	100	1.12	2744	30.79	8911
1986	1350	15.54	2497	28.75	931	10.72	631	7.26	553	6.37	54	0.62	2670	30.74	8686
1987	1250	14.05	2486	27.95	1081	12.15	641	7.21	640	7.19	114	1.28	2683	30.16	8895
1988	1337	13.48	3067	30.91	1176	11.85	535	5.39	772	7.78	96	0.97	2839	28.61	9922
1989	1376	13.64	2880	28.54	971	9.62	691	6.85	1163	11.53	41	0.41	2969	29.42	10091
1990	1364	12.14	3040	27.05	1022	9.09	471	4.19	1342	11.94	73	0.65	3925	34.93	11237
1991	1094	10.93	2510	25.07	778	7.77	406	4.06	1175	11.74	100	1.00	3949	39.44	10012
1992	890	11.56	2068	26.86	596	7.74	302	3.92	804	10.44	62	0.81	2978	38.68	7700
1993	991	13.01	18221	23.90	617	8.09	402	5.28	780	10.24	68	0.89	2939	38.58	7618
1994	755	9.86	1884	24.61	623	8.14	287	3.75	983	12.84	56	0.73	3068	40.07	7656
1995	982	13.25	1669	22.53	598	8.07	379	5.12	804	10.85	76	1.03	2901	39.15	7409
1996	941	12.03	1901	24.31	623	7.97	460	5.88	731	9.35	78	0.09	3087	39.47	7821
1997	878	10.70	1458	17.76	670	8.16	549	6.69	990	12.06	100	1.22	3564	43.42	8209
1998	952	10.74	1821	20.53	802	9.04	608	6.86	843	9.51	39	0.04	3803	42.88	8868
1999	864	9.89	1729	19.78	685	7.83	564	6.45	910	10.41	26	0.02	3961	45.32	8739

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh.
2. E.S.O., Various Issues of Statistical Abstract, Punjab, Chandigarh.

Note: 1. N.A. = Not available

Table 31
Work Stoppages by Causes in Punjab (1968-99)

Year	Wages & allowances		Bonus		Personal matters		Retrenchment		Leaves & holidays		Indiscipline & violence		Other causes		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1968	19	67.38	2	7.14	1	3.57	1	3.57	-	-	-	-	5	17.86	28
1969	5	21.74	1	4.35	-	-	4	17.39	1	4.35	-	-	12	50.17	23
1970	9	40.40	1	4.55	1	4.55	-	-	-	-	-	-	11	50.00	22
1971	9	60.00	1	6.67	-	-	1	6.67	-	-	-	-	4	26.66	15
1972	10	33.33	3	10.00	4	13.33	2	6.67	-	-	-	-	11	36.67	30
1973	12	21.82	7	12.73	16	29.09	3	5.45	1	1.82	-	-	16	29.99	55
1974	9	37.50	2	8.33	2	8.33	3	12.50	-	-	-	-	8	33.33	24
1975	6	28.57	-	-	5	23.80	1	4.76	1	4.76	-	-	8	38.10	21
1976	4	12.12	7	21.21	7	21.21	5	15.15	-	-	-	-	10	30.30	33
1977	26	45.61	11	19.30	10	17.54	1	1.75	1	1.75	-	-	8	14.04	57
1978	48	51.06	6	6.38	17	18.09	5	5.32	1	1.06	-	-	17	18.09	94
1979	39	35.46	10	9.09	32	29.09	6	5.45	1	0.91	-	-	22	20.00	110
1980	38	42.70	7	7.87	23	25.84	-	-	5	5.62	-	-	16	17.98	89
1981	28	31.46	11	12.36	20	22.47	3	3.37	1	1.12	-	-	26	29.21	89
1982	28	36.84	3	3.95	23	30.26	1	1.32	1	1.32	-	-	20	26.32	76
1983	22	30.99	4	5.63	24	33.80	5	7.04	1	1.41	-	-	15	21.13	71
1984	13	34.21	3	7.89	14	36.84	-	-	-	-	-	-	8	21.05	38
1985	11	23.91	1	2.17	15	32.61	-	-	-	-	2	(4.35)	17	36.96	46
1986	16	28.57	3	5.36	15	26.79	2	3.57	1	1.78	2	(3.57)	17	30.36	56
1987	14	28.00	5	10.00	11	22.00	1	2.00	3	4.00	7	(14.00)	9	18.00	50
1988	11	25.00	4	9.09	19	43.18	-	-	-	-	6	(11.36)	5	11.36	44
1989	21	40.38	3	5.77	16	30.77	3	5.77	1	1.92	5	(5.77)	5	9.62	52
1990	23	33.33	6	8.70	20	28.98	9	13.04	-	-	5	(7.75)	6	8.69	69
1991	20	44.44	8	17.78	8	17.78	-	-	-	-	2	(4.44)	7	15.56	45
1992	10	34.48	3	10.34	6	20.68	-	-	-	-	3	(10.34)	7	24.14	29
1993	10	23.81	3	7.14	9	21.43	3	7.14	1	2.38	5	(11.90)	11	26.19	42
1994	5	17.86	1	3.57	5	17.86	4	14.28	-	-	-	-	13	46.43	28
1995	7	31.82	8	36.36	5	22.73	2	9.09	-	-	-	-	-	-	22
1996	9	39.13	4	17.39	2	8.69	3	13.04	-	-	-	-	5	21.74	23
1997	10	35.71	1	3.57	7	25.00	4	14.29	-	-	-	-	6	21.43	28
1998	5	21.73	2	8.70	3	13.04	1	4.35	-	-	-	-	12	52.17	23
1999	5	25.00	3	15.00	4	20.00	1	5.00	-	-	-	-	7	35.00	20

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh.
2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh

Table 32
Resolution of Industrial Disputes in Punjab (1969-99)

Year	Disputes pending under examination at the beginning of the year	Disputes during the year	Total disputes available for disposal		Disputes settled mutually or in conciliation		Disputes withdrawn by workers/unions		Disputes referred for arbitration		Disputes rejected or filed		Disputes referred for adjudication		Disputes pending for disposal at the end of the year			
															With conciliation officer		With Labour Commissioner or Government	
			No.	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1969	314	2340	2654	100	731	27.54	673	25.35	15	0.57	380	14.32	539	20.31	154	5.80	162	6.10
1970	316	3514	3830	100	816	21.31	866	22.61	23	0.60	322	8.41	1146	29.92	225	5.87	432	11.28
1971	657	3094	3751	100	722	27.25	888	23.67	19	0.51	313	8.34	1096	29.22	185	4.93	228	6.08
1972	413	3574	3987	100	885	22.20	1022	25.63	15	0.38	312	7.83	867	21.75	495	2.42	391	9.81
1973	886	4432	5318	100	1284	24.14	1272	23.92	4	0.08	344	6.47	1160	21.81	512	9.63	742	13.95
1974	1254	4254	5508	100	818	14.85	1291	23.44	2	0.04	388	7.04	1382	25.09	742	3.47	885	16.07
1975	1627	4932	6559	100	1039	15.84	1505	22.95	7	0.11	374	5.70	1975	30.11	666	10.15	993	15.14
1976	1659	6411	8070	100	1391	17.24	1712	21.21	10	0.12	53	0.66	3096	38.36	525	6.51	1283	15.90
1977	1808	5430	7238	100	970	13.40	1390	19.20	12	0.17	97	1.34	2803	38.73	584	8.09	1382	19.09
1978	1966	5987	7953	100	934	11.74	1553	19.53	6	0.08	305	3.84	2709	34.06	691	8.69	1755	22.07
1979	2466	6802	9248	100	1233	13.30	1460	15.75	2	0.02	573	6.18	4061	43.82	560	6.06	1379	14.88
1980	1939	7830	9769	100	1504	15.40	1633	16.72	-	-	1093	11.19	4073	41.69	-	-	1466	15.66*
1981	1466	8072	9538	100	1770	18.56	2137	22.41	-	-	706	7.40	3025	31.72	1196	12.54	704	7.38
1982	1900	7995	9895	100	1570	15.87	2544	25.71	-	-	580	5.86	3721	37.60	918	9.28	562	5.68
1983	1480	8989	10469	100	1598	15.26	2859	27.31	-	-	936	8.94	2655	25.36	1303	12.45	1118	10.68
1984	2421	8217	10638	100	1704	16.02	3235	30.41	-	-	888	8.35	712	6.69	2364	22.22	1735	16.31
1985	1735	8908	10643	100	1661	15.61	2699	25.36	3	0.03	683	6.42	3381	31.77	1702	15.99	514	4.83
1986	2216	8686	10902	100	1544	14.16	3405	31.23	-	-	941	8.63	2169	19.90	1747	16.02	1096	10.05
1987	2843	8895	11738	100	1506	12.83	3540	30.16	-	-	685	5.84	3003	25.58	2125	18.10	879	7.49
1988	3004	9922	12926	100	1165	9.01	4218	32.63	-	-	868	6.72	3596	27.82	2018	15.61	1061	8.21
1989	3079	10091	13170	100	1160	8.81	4171	31.67	-	-	796	6.06	4574	34.73	2029	15.41	440	3.34
1990	2469	11237	13706	100	1125	8.21	4458	32.53	-	-	1204	8.78	4267	31.13	2331	17.00	321	2.34
1991	2652	10012	12664	100	1470	11.61	3635	28.70	-	-	790	6.24	4025	31.78	2364	18.67	380	3.00
1992	2744	7700	10444	100	1080	10.34	2678	25.64	-	-	559	5.35	4017	38.46	1803	17.26	307	2.94
1993	2110	7618	9728	100	983	10.10	3087	31.73	-	-	914	9.40	2416	24.84	1597	16.42	731	7.51
1994	2328	7654	9982	100	962	9.64	2966	29.71	-	-	934	9.36	2358	23.62	1587	15.90	1175	11.77
1995	2762	7409	10171	100	1039	10.21	2200	21.63	-	-	762	7.49	3602	35.41	-	-	2668	26.23
1996	2668	7820	10448	100	1439	13.77	2498	23.91	-	-	716	6.85	2827	27.05	-	-	3008	28.79
1997	3008	8211	11219	100	1281	11.41	2750	24.51	-	-	300	2.67	3578	31.89	-	-	3310	29.50
1998	3310	8868	12178	100	1055	8.66	3482	28.59	-	-	868	7.13	3109	25.53	2387	19.61	1277	10.49
1999	3664	8727	12391	100	975	7.87	3514	28.36	-	-	387	3.12	4714	38.04	2146	17.32	655	5.29

Sources: 1. Office of the Labour Commissioner, Punjab, Chandigarh.
2. E.S.O., Various Issues of *Statistical Abstract*, Punjab, Chandigarh

Note: 1. *: Break-up of disputes pending for disposals at the end of the year with conciliation officer or with labour Commissioner/ Government

withdrawn either by the workers themselves, or on the persuasion of conciliation officers. On an average, six to seven per cent of the cases were rejected, or filed by the government, during this period. Adjudication continues to be the most important method. It has been used to resolve 20 to 40 per cent of the disputes on an average. Gani (1990: 60) and Ratnam (1996: 13) also mention greater dependence on adjudication for the resolution of disputes. Its use was exceptionally high in 1979 and 1980. Voluntary arbitration has fallen into disuse over the period under study. Industrial disputes, pending before the conciliation machinery, or under examination with the government, have grown to about 20 per cent, or more. This points to the inefficiency, or inadequacy, of the machinery available to handle industrial disputes.

Recently, the Punjab Labour Department has adopted a new strategy of holding Lok Adalats for resolving industrial disputes pending in labour courts. According to the *State Development Report on Labour* of the Labour Department of Punjab, these Lok Adalats were started with the dual aim of a) relieving courts of their heavy workload; and b) developing an alternative dispute settlement mechanism. Firstly, it was to reduce dependency on adjudication and to get the workers and trade unions to repose their trust in the conciliation machinery of the state, and secondly to provide justice to the workers without any cost. This system is gaining momentum and one hopes would be successful in looking after the interests of the workers.

SOCIAL SECURITY AND WELFARE SCHEMES

The modern concept of social security is a product of the industrial revolution in the West. Earlier, in India, the joint family system was able to meet the needs of social security of a person. But with the breakup of the joint family system, due to migration of unemployed members of the family to the cities to work in industries, the need for social security was felt. In India, the evolution and development of social security schemes is mainly a post-independence phenomenon. Though the right to social security has not been specifically included in the Constitution of the country, one of the Directive Principles (Article 41) of State Policy lays down: 'the state shall within the limits of its economic capacity and development make effective provisions for securing the right to work, to education and to public assistance in case of unemployment, old age, sickness and disablement and in other case of undeserved want;

According to the *Annual Report on Labour (1999-2000)* of the Ministry of Labour, Government of India, social security refers to the protection, which society provides for its members through a series of public measures against economic and social distress, caused by stoppage or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, invalidity, old age and death and for providing for medical care, which is subsidized in the case of families with children. Social security programmes are designed to provide benefits, in both cash and kind, on the occurrence of such contingencies.

Under the Constitution of India, social security in its broad sense, as envisaged in the Directive Principles of State Policy, is a major aspect of public policy today and the extent of its prevalence is a measure of the progress made by a country towards the ideal of a welfare state.

Basically, the concept is based on ideals of human dignity and social justice. The International Labour Organization (ILO), in its various declarations, conventions and

- recommendations, outline the concept of social security. In the Philadelphia Declaration of 1944, the ILO has enjoined for itself a solemn obligation to further, among the nations of the world, programmes which will achieve the extension of social security measures to provide a basic income to all in need of such protection and comprehensive medical care (Rajan, 2000:4). The ILO convention No. 102 (27 April 1955) lays down the minimum standards of social security. They comprise: (i) medical care; (ii) sickness benefit; (iii) unemployment benefit; (iv) old-age benefit; (v) employment injury benefit; (vi) family benefit (vii) maternity benefit (viii) invalidity benefit (ix) survivors' benefit

India has not ratified all the ILO conventions relating to social security. The social security conventions of ILO ratified by India are the following:

Convention No.18: Workmen's Compensation (Occupational Diseases) 1925.

Convention No. 19:Equality of Treatment (Accident Compensation) 1925.

Convention No.42: Workmen's Compensation (Occupational Diseases).

Convention (Revised) 1934.

Convention No. 118: Equality of Treatment (Social Security) 1962.

There are national laws, which provide for certain mandatory benefits in respect of certain employments. These include medical care and sickness benefits, invalidity and survivors' benefits, employment-injury benefits and maternity benefits. There are laws enacted and schemes established by the Central/State Governments providing for the social security and welfare of specific categories of working people.

The principal social security laws enacted by the Central Government are the following:

- (a) The Workmen's Compensation Act, 1923 (W.C. Act).
- (b) The Employees' State Insurance Act, 1948 (ESI Act).
- (c) The Employees' Provident Funds and Miscellaneous Provision Act, 1952 (EPF Act).
- (d) The Maternity Benefit Act, 1961 (MB Act).
- (e) The Payment of Gratuity Act, 1972 (PG Act).

The concept and approach evolved by ILO towards social security in best suited to the developed countries, where the large proportion of workers are in regular salaried employment in the organized sector with adequately high levels of income and the National or State Governments are able to provide social security through mandatory insurance with contributions from a large segment of the population.

Several experts on social security did not advocate this ILO approach and said that it would not be appropriate for the developing countries, including India, where an overwhelmingly large proportion of the workforce does not enjoy a regular salaried income, as more than 90 per cent of is engaged in the unorganized sector and only less than 10 per cent enjoy the benefits of the organized sector. They further maintained that social security in the developing countries like India has to be integrated with anti-poverty policies, such as employment guarantees and security (Rajan, 2000:7). This, India has been doing since independence, but it has so far failed to evolve any comprehensive social security programme for the disadvantaged sections of the society. Because of this, only the workforce involved in the organized sector can take advantage of the schemes/laws for social security.

As Punjab has not yet evolved any independent social security programme of its own, it follows the policies, laws, Acts, programmes of the Central Government. About 13 per cent of the workforce engaged in the organized sector in the state enjoy the benefits of social security schemes, but the majority engaged in the unorganized sector are not covered by these schemes. Thus the position of Punjab is also not much better than the rest of the country.

At the all-India level, out of an estimated workforce of about 39.7 crore, only 2.8 crore enjoy the benefit of formal social security protection. *The Working Group on Social Security for the Tenth Five Year Plan (2002-2007)*, Government of India, has pointed out that as the implementation of social security laws is the responsibility of the employer, it depends mainly upon his good behaviour, or sweet will. Where the employers are enlightened, or there are powerful trade unions, the rights of the workers are protected and the compensations are paid as per the Act. In all other cases there is a tendency to pay a nominal compensation or even to deny it. In such cases the only remedy available to the workers or the dependents is to approach the State Labour Department concerned and seek its intervention, which goes upto arbitration, which is time consuming. Even after arbitration there is no way in which the state authorities are in a position to enforce the payment of compensation.

Very often, it is seen that small employers, even with very good intentions, do not have adequate funds to discharge their liabilities. Another significant finding of the study group is that several attempts have been made in the past to address the multifarious problems faced by the workers in the unorganized sector, through legislative as well as programme-oriented measures. Even through these measures we have not succeeded in achieving the desired objective, partly on account of the ignorance, illiteracy and lack of unionization of workers on the one hand, and the resource constraints of the state on the other. Therefore, there is need for a well-designed social security system in Punjab, especially for workers engaged in small-scale units, or the unorganized sector. The support and involvement of government is essential in this regard.

Keeping this situation in mind, the Working Group has stressed that a well-designed social security system for the workers in the unorganized sector will help in improving productivity, contribute to harmonious labour/industrial relations and thus to socio-economic development. It will encourage and propagate social peace by reducing the frequency of industrial conflicts, increase willingness to work, make it easier to meet improved quality products, ensure a better investment climate and thereby enhance the competitiveness of the economy. It is suggested here that the Punjab Government should make its own comprehensive social security policy for labour, as it is one of the developed states of India (*Working Group on Social Security for Tenth Plan, 2002-2007*).

Welfare Schemes

With the help of the Central Government, the Punjab Government is running a number welfare schemes for workers, with focus on child and women labour, and the wards of workers.

According to the *State Development Report (SDR)*, brought out by the Department of Labour and Employment, Government of Punjab, the Labour Department, with the assistance of Central Labour Ministry, has started the National Child Labour Project (NCLP) for the eradication and welfare of child labour. Under this programme, 27

schools have been opened in the year 2000 in Jalandhar. In these schools, child workers (main and marginal) and those who are likely to become child labour are admitted. The management and the day to day running of these schools have been entrusted to NGOs, voluntary organizations, trade unions and locally active clubs.

The school buildings are within the walking distance for the children. The aims, objectives and working style of these special schools have been explained to the teachers. The curriculum of these schools is the same as that of the regular primary schools. Each child is given a stipend of Rs. 100 per month, and Rs. 2.50 per child per day is spent on refreshments for nutrition. The children are expected to reach the 5th standard within the project period of three years. After completing the special school education, the children are expected to join the formal stream of education in the 6th standard. Those who are not interested in further studies can join a vocation of their choice for which they will get training in these schools. So far, vocational guidance is not being provided in these schools. However, the requisite skill would be provided to the children according to the guidelines of the project.

In the Jalandhar project, under the NCLP, a total of 1,350 children were admitted with the ratio of 50 children in each school. This project has been extended to Ludhiana and Amritsar, major industrial cities. Another welfare scheme, of the Labour Department, Government of Punjab, is the organization of health camps with the co-operation of employers, trade unions and social organizations, in which the workers get medical checkup and medicine.

The Labour Welfare Board, last constituted on 22 March 2000 looks after the other welfare aspects of labour. The basic function of the Board is to provide benefits to industrial workers and their families, under different schemes. The main sources of income of the Board are:

1. Grant-in-aid by the state government.
2. Voluntary donations.
3. Unpaid accommodations transferred to Welfare Fund.
4. Interest of FDRs deposited with banks.

The following welfare schemes are run by the Board:

- i) Balwardis for the children of the industrial workers.
- ii) Interest-free loans.
- iii) Grant of stipend to the children/wards of industrial workers and to industrial workers, for studies.
- iv) Schemes for grant of ex-gratia to the widows of industrial workers.
- v) Cinema shows for recreation of industrial workers and their families.
- vi) Labour welfare centres.

According to the *Annual Report (2000)* of the Labour Department, 17 Labour Welfare Centres have been set up for the benefit of the workers and their dependents, especially women, at important towns, namely, Amritsar, Ludhiana, Bathinda, Phagwara, Jalandhar, Patiala, Gobindgarh, Rajpura, Mohali, Nangal, Abohar, Anandpur Sahib and Sangrur. These centres impart free training in sewing, knitting and embroidery to the female members of the workers' families.

CONCLUSIONS AND SUGGESTIONS

Conclusions

- Trade unionism in Punjab as well as in India developed along with the country's freedom struggle. In Punjab, it grew and developed largely after India's independence and particularly after the reorganization of the state of Punjab in 1966.
- Trade unionism in Punjab in the organized sector as a whole is in a fairly healthy shape, but it is very weak in the unorganized sector, where about 87 per cent of the workforce is engaged. The number of registered trade unions, which are primarily in the organized sector, has increased from 536 in 1968 to 2,297 in 1999.
- The proportion of large-sized unions has been increasing, and the changing membership pattern of the unions shows that workers now join those with a large membership. This further shows that in future, the trade unions will be able to bargain from a position of strength and the decisions arrived at by such large unions will be acceptable to a large number of workers. The percentage of independent unions has declined over the years, as they see no future without affiliation to one of the federations.
- In 1999, in Punjab, BMS had the maximum unions affiliated to it and the maximum percentage of membership in the state. But AITUC has declined in respect of both. INTUC has lost ground over the last 25 year in terms of unions affiliated to it as well in membership.
- A declining trend has been observed in industrial disputes, conflicts, mandays lost and number of workers involved in these. These are significant aspects of the industrial relations scene in Punjab. One must also note the weakening position of workers' organizations, fear of losing employment, weakness of small-size unions and the undemocratic attitude of the management. The majority of the industrial disputes have been raised by AITUC and CITU, federations with leftist leanings.
- The analysis of the data shows that the pattern of industrial development in Punjab will be more capital-intensive, not labour-intensive. This will bring a qualitative shift in the nature of industrial employment. More of the employees will be skilled, technical and professional. This will have far-reaching influences on the industrial relations system in Punjab, as the majority of the semi-skilled and unskilled labour will become redundant.
- Another significant characteristic of trade unions in Punjab and elsewhere is their political affiliation, which divides unions along political lines to serve the political interests of respective parties. This has a negative impact on the organized strength of the working class and trade unions in serving their own interests.
- Primary causes of work stoppages in Punjab, as at the all-India level, have been economic, i.e., issues related to wages, allowances and bonus.
- The disputes settlement machinery in Punjab has not been very effective. The workers seem to have developed an indifferent attitude towards the government machinery of the Labour Department. That is why they prefer settling their dispute through the court, and adjudication continues to be the most effective method for resolving industrial disputes in Punjab.
- The government is withdrawing from intervention in industrial disputes and tripartite negotiations have been replaced by the bipartite system, in which

management and the workers settle disputes between themselves. It can be concluded that the position of the management has become stronger than that of the workers and their unions.

Suggestions

- In order to maintain the spirit of the Constitution and to safeguard the interests of the democratic welfare state in India, it is obligatory for the law making machinery to take into consideration the basic tenets, i.e., justice, equality, fraternity and liberty enshrined in our Constitution. If this is borne in mind then it will be possible to maintain and strengthen the aims and objectives of the Constitution.
- As seen in practice, the present labour laws are cumbersome and tedious in the process of their application, and anybody can draw any meaning from these laws at one's pleasure. Laws should, therefore, be very simple to understand and comprehensive in their nature.
- Errors and omissions, as identified, must be rectified speedily. Whenever some amendment is needed it must be carried out quickly. Disputes should not be kept pending but be decided in the shortest possible time.
- Government must avoid becoming a mouthpiece of any one section of the society, as it represents the entire nation. A democratic government is also expected to look after the interests of all sections of the society.
- Labour laws must be implemented in their true spirit by the Labour Department. If it does not do so it should be held responsible for the non-implementation of these laws.
- Laws should be strictly followed by both the parties, i.e., employers and employees, and if any agreement is reached between the two then it must be adopted and followed by both.
- Reports about the implementation of labour laws, as prepared by independent bodies of intellectuals and submitted to government, must be made public.
- The already existing regulatory committees, tripartite and bipartite must be made effective to make industrial relations smooth and peaceful, by holding regular meetings and putting forward their advice and recommendations.
- It is necessary to study the labour laws as applied, monitor and evaluate them from time to time. It has also to be seen whether we are following the directions of the ILO.
- One-enterprise one-union must be made mandatory and union elections should be through secret ballot. As stated above, these provisions must be incorporated in labour laws and their application too must be made mandatory.
- The institution of the welfare officer must be defined, to make labour laws more effective and practical, and it should not appear that he is only a representative of the management. It has been observed that the labour welfare officer has become ineffective and dysfunctional in practice.
- As well-known economists the world over, have pointed-out, labour is the backbone of every economy, of every country of the world. Therefore, the welfare of labour must be given first priority.
- In the case of agro-industries, a co-ordination committee of workers, farmers and managements should be constituted in each industry. This will not only help resolve problems of all the three, but also promote smooth functioning of these industrial units and help to bring harmony in industrial relations.

- Trade unions should avoid prolonged work stoppages, as these can aggravate the conflict and hostility between the social partners and ultimately cause loss of production.
- There is no need for separate unions for migrant workers, since the interests of both migrant and local workers are the same. At the same time, the union leadership and management must address the problems of migrants to win their confidence and ensure their participation in trade union activities.
- Management and government should consider the genuine demands of the workers sympathetically, in the changing environment.
- Punjab Government, with the help of the Central Government, or on its own, should start some vocational or technical courses to train the local workforce to meet the requirements of specific industries. This would increase employment of local labour and also reduce dependence on migrant labour.
- Formulation of a rational wage policy for future wage-dispute settlements, should be founded on the state's development needs and per capita income.
- The state government should evolve a comprehensive social security programme for labour in general and for those working in the unorganized sector in particular, so that they can feel secure during times of difficulty.
- While formulating standing orders, opinions of workers' unions should be taken into account. Workers and their unions should be involved in all major policy decisions affecting the workers, in the interests of better industrial relations. The workers should feel part of the enterprises/establishment, rather than a mere a factor of production.
- Consensus should be encouraged and the conciliation officer should be instructed to take/give objective decisions, which are agreeable to both the parties -- management and trade unions/workers. For the effectiveness of this process, suitable training should be imparted to the conciliation officer on a continuing basis.
- A reasonable time limit should be fixed to settle disputes, through conciliation or collective bargaining, to avoid their prolongation.
- Encouragement and support to the process of collective bargaining in the private as well as public sector organizations will definitely help initiate harmonious industrial relations.
- As it is perceived, some officers employed in the Labour Department, after superannuation, get lucrative jobs/employment in industrial establishments. This must be banned under law as it encourages anti-labour attitudes.

References

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Chapter 13

INFORMATION TECHNOLOGY: GROWTH AND DEVELOPMENT STRATEGY

IT SOFTWARE AND SERVICE INDUSTRY¹

Information Technology (IT), a knowledge-based industry, has the tremendous potential of becoming an engine of accelerated economic growth, productivity improvement for all sectors of the economy and means of efficient governance. It enhances access to information, protects consumers, provides access to government services, makes skill formation and training more effective, improves delivery health services, and promotes transparency. It provides tremendous employment potential and linkages between government and the people both at the rural and urban level. Investment in knowledge-based industries will determine the level of the country's dominant position in the world economy in the next two decades.

Status of IT Software and Service Industry in India

The Indian IT software and service industry has emerged as one of the fastest growing sectors in the Indian economy, with a growth rate exceeding 50 per cent in exports and 40 per cent in the total IT industry over the last five years. Table 1 shows the turnover of this industry including domestic and exports.

Table 1
Indian Software and Service Industry (USb\$)

Year	Domestic	Exports	Total	Percentage Growth Rate (Export)	Percentage Growth Rate (Domestic and Export)
1994-95	0.35	0.485	0.835		
1995-96	0.49	0.734	1.224	51.34	46.60
1996-97	0.67	1.085	1.755	47.82	43.40
1997-98	0.95	1.750	2.700	61.29	53.80
1998-99	1.25	2.650	3.900	51.43	44.40
1999-2000	1.70	4.000	5.700	50.94	46.10
2000-01	1.96	6.300	8.260	57.50	44.90

Source: Based on Hanna (1994), Heels (1995) and Masco (2001)

Exports declined during 2001-02, primarily due to the slow-down in the US economy after the 11 September 2001 terrorist attack. However, the NASSCOM-McKinsey Report 2002 has projected that the Indian IT software and service industry will still achieve a turnover of US\$ 80billion (approximately 7.0 per cent of GDP) by 2008, because of the expected increase in the IT Enabled Services (ITES) sector.

The IT software and service industry has been categorized into three broad sectors:

- Software Product and Technology Services,

¹ The electronics hardware, including computers and peripherals, have been dealt with separately in Chapter 6, entitled 'Industrial Development'.

- IT Services, and
- IT Enabled Services.

The projected turnover of industry in India by 2007 and 2008 is given in Table 2.

Table 2
Projected Turnover of IT Software and Service Industry in India by 2007 and 2008

Category	By 2007* (US\$ b)	By 2008 (US\$ b)
A. Exports		
Software Product and Technology	8	11
Services	22	30
IT Services	18	24
IT Enabled Services		
Total	48	65
B. Domestic	12	15
(A+B)	60	80

Source: NASSCOM-Mckinsey Report, 2002. * Calculated on the basis of 34% growth rate

Status of IT Software and Service Industry in Punjab

During the eighth plan period, i.e., 1992-1997, there was hardly any activity in the IT software and service industry in Punjab. It made a beginning only when the Software Technology Park (STPI) of the Government of India came into operation at Mohali in 1998-99. Since the announcement of the policy of tax holiday for STPIs by the Government of India for a period of 10 years, 145 software units have registered with STPI Mohali till 2001-02. However, the number of units in operation is only 65. Table 3 shows the state-wise software exports of India through STPI during 2000-01.

Table 3
State-wise Software Exports through STPI* of India during 2000-01

State	Exports (in crore)	Percentage
Karnataka	7475	37.27
Tamil Nadu	2956	14.74
Maharashtra	2570	12.82
Andhra Pradesh	2017	10.06
Uttar Pradesh	1660	8.23
Haryana	1450	7.23
Delhi	1100	5.49
West Bengal	250	1.25
Orissa	200	1.00
Kerala	141	0.70
Gujarat	102	0.51
Punjab (STPI, Mohali)	52	0.26
Madhya Pradesh	50	0.25
Rajasthan	30	0.15
Total	20054	100.00

Source: Software Technology Parks of India, New Delhi

Note: * Software Technology Parks of India

Table 4 shows IT software and service exports through STPI, Mohali (Punjab) from 1998-99 to 2001-02. In 2001-2002, the exports were Rs. 70 crore.

Table 4
IT Software and Service Exports through STPI, Mohali

	1998-99	1999-00	2000-01	2001-02
IT Enabled Services	4.70	7.01	17.36	30.00
Software Development	3.07	7.79	34.64	40.00
Total	7.77	14.80	52.00	70.00

Source: Software Technology Parks of India, Mohali

During the last two years, the private sector has been in the process of setting up IT infrastructure in Punjab: Mahindra & Mahindra software technology park in Mohali; Reliance, HFCL and VSNL are setting up telecom infrastructure in Punjab. The progress is rather very slow. The share of Punjab in the Indian IT software and service industry is very meagre, i.e., 0.26 per cent in 2001-2002. (See Table 3)

During the Ninth Plan, there has not been any significant progress in the IT industry, in spite of the fact that the policies of the Punjab Government are as attractive as of such other states as Karnataka. Some of the specific constraints for the insignificant growth of IT Industry are as follows:

- Quality of infrastructure required for IT industry was not available.
- Quality of human resource was not matching with IT industry's requirements.
- Insufficient funds for IT industry.
- Lack of direction and vision.
- Non-conducive environment.

The IT industry in other states of India, where high quality infrastructure and trained manpower are available, has achieved accelerated growth and increased its share from 0.6 per cent to six per cent of the total turnover of the IT industry in India during the last five years, mainly due to robust growth in the ITES segment. The IT Industry in Haryana has grown from a turnover of Rs. 400 crore in 1999-2000 to Rs. 2,054 crore in 2000-01, an almost five fold increase. Punjab, therefore, can also aim at and achieve five per cent share of the total IT industry in India by the year 2007, with emphasis on ITES. In view of the present status of the software industry in Punjab, i.e., 0.26 per cent share, the projection of five per cent share by 2007 is very optimistic. To achieve this, a fast track approach will have to be adopted. The suggestions and recommendations made in this report have to be implemented to ensure such rapid growth. A conducive environment must be created to ensure that both national and international MNCs set up IT Industries in Punjab.

For achieving a five per cent share, it is recommended that targets be fixed for a four per cent share of the national turnover (according to the NASSCOM-McKinney, Report 2002) for software products and technology services and the same for IT services, because each of these involves high technology and longer gestation period, and a seven per cent share for IT Enabled Services, as it has a shorter gestation period and a huge employment potential. Projected category-wise turnover of IT software and service industry in Punjab by 2007 is shown in Table 5.

Table 5
Projected Category-wise Turnover of IT Software and Service Industry in Punjab by 2007*

Software and Service Industry	Targeted percentage share for Punjab in terms of projected national turnover	Turnover in 2006-07 Rs. in Crore (In US\$ b)
A. Exports		
"Category A"		
Software Product and Technology Services	4	1600 (0.32)
"Category B"		
IT Services		
"Category C"	4	4400 (0.88)
IT Enabled Services		
Total	7	6300 (1.26)
		12300 (2.46)
B. Domestic	5	3000 (0.60)
(A+B)	5	15300 (3.06)

Source: Projections based on Nasscom-Mckinsey Report, 2002

Software Product and Technology Services provide a high growth opportunity for the Indian software industry. Indian companies have a market potential of software product development, such as enterprise software (e-business solution, ERP, e-corporate governance), consumer software (personal productivity tools) and embedded software. Indian companies have developed a number of highly acclaimed and popular packages, such as HR management and business accounting by TCS, banking automation packages by Infosys, ERP tools by RANCO, etc.

This segment is high-technology oriented and requires highly skilled professionals. In the shorter term, there will be limited development in the area, as R&D budgets of the companies are limited. Taking these factors into account, Punjab has to aim to achieve at least four per cent of US\$ 8billion, i.e., US\$ 0.32billion (Rs. 1,600 crore) by 2007 (Table 5).

IT Services are undergoing a structural change from client/server to web/package-based services. This will form the major chunk of IT services. Growth in IT services will continue to provide the biggest opportunity, while other sectors of IT software industry will also make a significant contribution. IT services, both export and domestic, will grow rapidly as new opportunities are emerging in management/consulting services, application maintenance and Internet services. The major users of IT services are the government, financial services and banking, manufacturing and retail and distribution. New areas likely to emerge are communication, healthcare and utilities, as these will increasingly be deregulated. However, IT services essentially require high-quality manpower, state of the art skills, world-class telecom and IT-knowledge based environment.

* A detailed report has to be prepared for all major activities/segments on the pattern of Andhra Pradesh. To project year-wise targets and for their monitoring, a detailed survey has to be carried out to prepare the report.

The importance of IT services can be judged from the fact that they will account for 45.8 per cent of the total turnover of the software industry, i.e., US\$ 22billion out of US\$ 48billion projected export by 2007. Punjab should aim at achieving at least four per cent of US\$ 22billion, i.e., US\$ 0.88 billion (Rs. 4,400 crore) by 2007 (Table 5)

The ITES sector in India has emerged as a key engine of growth for the Indian IT industry and the technology-led services industry. This sector has grown from Rs. 2,400 crore in 1999-2000 to Rs. 4,100 crore in 2000-2001, providing employment to 70,000 people.

It covers a wide range of services, some of which are:

- Customer-interaction services including call centres.
- Back offices, revenue accounting, data entry, data conversion and HR services.
- Transcription and translation services.
- Content development and animation.
- Other services, including remote education, data search, GIS, market research and network consultancy.

The employment potential in ITES is substantial and the gestation period is lesser than in other sectors of the IT industry. It is highly quality-oriented, human –resource intensive and requires consistent performance with high standards. Therefore, the success of ITES will mainly depend on the quality of manpower and infrastructure. Knowledge-based skill-oriented training is the key to quality of manpower. ITES to succeed requires top-class infrastructure with adequate bandwidth, fault-free and continuous power with two layers of redundancy to avoid any breakdown.

US technology firms are rapidly shifting back-office functions to India. Foreign firms are eagerly waiting to set up centres to process financial claims, payroll-data, building customer-support desk, etc. According to a NASSCOM study, GE Capital has saved US\$ 270million, CITI Bank US\$ 70million and British Airways (BA) US\$ 42million, a total of US\$ 385million saved per year, as a result of their shifting back-office operations from US to India. Most of the firms already in India are in the process of expanding and eager to set up operations in other areas of the country.

ITES, or remote processing, presents a golden opportunity for Punjab. For this, the state has to emphasize on skill-formation through world-class training and infrastructure building. Punjab needs to garner at least seven per cent share of the total revenue of India in ITES. This can provide employment to 77,000 educated youth and generate a turnover of US\$ 1.26billion (Rs. 6,300 crore) by 2007 (Table 5).

A high-level committee of experts should be constituted for the promotion of the IT industry in the state to formulate a policy for ensuring a hassle-free and conducive environment to attract MNCs and NRIs to set up IT industries in Punjab. Special emphasis has to be placed on NRIs, keeping in view that a large number of them from Punjab are actively involved in the IT industry in USA and other developed countries. The proposed committee of experts should also monitor the growth of the IT industry in the state.

IT HUMAN RESOURCE DEVELOPMENT

India's main competitive advantage in the software and services industry is its abundant English-speaking and cost-effective human resource. As on 31 March 2001, it has 3,40,000 people working in the software and service sector in India, the second largest IT workforce after the US. According to the projections of the *Ministry of Information Technology (MIT) Report*, India needs to develop more than 22 lakh high quality knowledge workers in software and related areas by 2008.

To achieve an overall target of five per cent of the national turnover, i.e., US\$ 3.06 billion by 2007 (Table 5), Punjab would need 99,000 IT-trained manpower which has to be high quality and of the right mix of technical, business and functional skills to meet the needs of all business segments.

According to the *MIT Report*, human resource in IT has been categorized into three categories: Category 'A' includes higher-end professionals, category 'B' comprises professionals mainly for IT services and category 'C' for ITES. To achieve the projected turnover, Punjab needs 6,000 professionals for category 'A', 16,000 for category 'B' and 77,000 for category 'C'. Table 6 shows the projected category-wise IT manpower requirements by 2007 in Punjab (Table 6).

It is necessary to formulate appropriate strategy and measures in respect of requisite infrastructure with special focus on human resource, taking into account emerging educational technologies, to achieve the projected turnover of the Punjab IT industry. The total estimated cost of manpower-quality improvement is Rs. 60 crore during 2002-07. (Rs. 30 crore for Category 'C' and Rs. 15 crore each for Category 'A' and Category 'B')

Table 6
Projected IT Manpower Requirements during and by 2007 in Punjab

	Qualification	Estimated IT Manpower Requirements (India)	Projected IT Manpower Requirements as percentage of the National Requirement
Category 'A' Software Product and Technology Services	MS/M.Tech/B.Tech in Computer Science	1,50,000	6,000 (4%)
Category 'B' IT Services	B.Tech in Non-Computer Science, MCA	4,00,000	16000 (4%)
Category 'C' IT Enabled Services	BA/B.Sc/B.Com & Diploma and it is	11,00,000	77,000 (7%)
All		16,50,000	99,000 (6%)

Source: Projections based on Ministry of Information Technology, Report for Tenth Plan (2002-2007), Government of India. Figures have been proportionately adjusted as per the revised projections by NASSCOM-Mckinsey Report, 2002, from the earlier NASSCOM-Mckinsey Report, 1999.

Recommendations for IT HRD

- For quality improvement, Punjab has to train 99,000 high-quality manpower during 2002-2007. IT services (16,000), IT software product and technology services (6,000) and ITES (77,000).
- Upgradation, including networking, of infrastructure of the engineering colleges.
- Training of faculty to meet the required standards. Interaction and exchange of faculty members with institutes of higher learning in India and abroad.
- An IIT of an international standard should be set up to move up the value chain in IT industry. It will help the state catch up with other IT-developed states in India. It will also help to fill the much-needed gap in the availability of quality human resource.
- To ensure that high-quality IT manpower is being produced by both government and private institutions, it is recommended that Punjab Government should set up a State Council for Computer and IT Education (SCCE), a body of experts responsible for monitoring and fixing minimum standards for the quality of IT education in the state.

IT INFRASTRUCTURE

In today's IT-savvy world, the growth of every economy is linked with the growth of Information Technology and, in turn, sound and quality infrastructure is absolutely essential for this.

During last decade, the main contribution towards building IT infrastructure has been the Software Technology Park at Mohali, where private sector companies are in the process of setting up telecommunication infrastructure. So far the performance of Punjab has been dismal as compared to other IT-developed regions in India. During 2000-2001, out of the total export of Rs. 20,052 crore from STPIs across the country, Punjab had a total export of Rs. 52 crore, while Bangalore Software Technology Park had an export of Rs. 7,475 crore, Noida Rs. 4,350 crore, Chennai Rs. 2,956 crore, Mumbai Rs. 1,610 crore and Pune Rs. 960 crore.

It is vital to develop the quality IT infrastructure required to achieve the projected turnover of US\$ 3.06 billion by 2007 (Table 4) and to meet the other infrastructure requirements for IT-usage in various applications, including e-governance.

The main constituents of IT infrastructure are telecommunication-backbone both national and international, V-SAT infrastructure and Internet Service Providers (ISPs). IT software and services including ITES and Internet are among the major users of the IT infrastructure with adequate communication bandwidth. This sector is very sensitive to the quality as well as the size of the infrastructure. Presently, the infrastructure that exists in the telecommunication sector in Punjab along with the implementations of the future plans of the VSNL and other private operators such as HFCL and Reliance, is likely to meet the basic requirement of IT infrastructure in terms of good-quality connectivity by 2007. IT infrastructure being vital for the development of the IT Industry, the Ministry of Information Technology (MIT), Government of India in their Tenth Plan has recommended special norms for bandwidth. The Punjab Government has to ensure its timely and speedy implementation.

According to the study by NASSCOM, by 2002, the requirement of international bandwidth for connectivity to Internet was projected to be 100 Gbps. However, these projections could not be achieved as the expected growth of Internet could not take place, due to very high telephone tariff along with equally high cost of Internet backbone. This has resulted in inadequate demand. The number of Internet users and the availability of bandwidth are linked with each other; as such the bandwidth requirement is market dependent.

However, recently the basic service providers have reduced telephone charges, but the numbers of Internet users/Internet subscribers are not increasing at the expected rate. The Punjab Government has to formulate a policy to ensure usage of Internet in all its departments, public places, down to block and village level. It has to ensure adequate demand by way of creating a suitable IT culture and suitable infrastructure, so as to improve the viability of the ISPs.

It is proposed to develop three new IT cities and upgrade the existing infrastructure at Mohali, to achieve the projected turnover of the IT software industry. The infrastructure and quality should be such that each IT city should be able to generate, on an average, a turnover of between Rs. 3,000-5,000 crore yearly by 2007. The proposed IT cities should have, besides good quality telecom infrastructure, adequate basic infrastructure in terms of continuous uninterrupted power supply, good quality roads, efficient transport, proximity to airport, a good education and an R&D centre. The selection of these IT cities has to be based on the academic environment. Keeping this in view, the proposed new cities are Patiala, Jalandhar and Ludhiana. They have the academic environment suitable for the growth of the IT industry as already in place. However, these can be easily upgraded further so as to become 'Centres of Attraction' for investors to set up their production/research and development facilities in the field of information technology. The estimated cost of each IT city may be of the order of Rs. 150-200 crore and the cost of upgradation of the infrastructure at Mohali will be another Rs. 50 crore. Detailed proposals for each IT city have to be drawn up separately. Each city will have an STP as a prime mover. It is proposed that each IT city should have a separate development authority on the pattern of the Noida Development Authority, and function independently, to ensure its proper growth and development.

Venture Capital (VC) has played a vital role in the materialization and commercialization of innovative and creative ideas. The Indian software and service industry has emerged as one of the fastest growing sectors in the country. A large number of software companies, started by research-minded professionals with innovative ideas, have benefited and have succeeded in their ventures, with the help of the initial funding through seed money and venture capital. USA is a prime source of venture capital. According to the Indian Venture Capital Association (IVCA), venture capital funding in India was US\$ one billion in the year ending March 2002 and is likely to go up by 50 per cent to US\$ 1.5 billion in the current financial year.

The state government has already taken the initiative in this regard by setting up a Rs. 20 crore venture fund for the growth of the software industry in the state. It is suggested that fund be increased to Rs. 50 crore and a special allocation of Rs. 30 crore be made for the IT industry in the state. However, the state has to play a more proactive and pragmatic role by providing funds to bright young talented entrepreneurs, so that start-ups and ventures by qualified professionals are not unsuccessful for want of initial financial assistance. This will go a long way in building confidence among the

prospective young entrepreneurs and will create a much needed conducive and enabling culture, important for the growth of the IT software and service industry in the state.

E-GOVERNANCE

The objectives of e-governance are information dissemination to the public with any where or any time services to citizens, making the government machinery more easily accessible, transparent, effective, efficient, and accountable. A comprehensive citizen-service portal should be set up for this purpose, with such services as issuance of general certificates; services related to taxes, revenue, transport, permits and licenses, registration of all types; pension schemes, social security and welfare schemes; education training; employment; housing; infrastructure; financial assistance schemes; industries; agriculture; and other miscellaneous services. This will not only help implement e-governance but will also inculcate and create an IT culture in the state.

Implementation of e-governance necessitates top priority to computerization and networking of different departments at the headquarter, district and block level; identification of key departmental applications; creation of data-bases, digitization of public domain information; and availability of departmental data on a day-to-day basis.

The state government has already taken up an ambitious e-governance project, called e-Governance-Citizen Interface, to implement e-governance. It has chosen Fatehgarh Sahib as a pilot district for the implementation of this project. It envisages extension of the communication network, including hardware and software, within the district to connect the different offices linked with the DC office, which further will be connected to district centres and state headquarters. The state should ensure the completion of the project in Fatehgarh Sahib and set up similar projects in other districts so that government and the people draw maximum benefit from IT and e-governance.

To facilitate and implement e-governance in the state, the following measures are recommended:

- Launch a massive programme for rural and urban connectivity. Establish Punjab-wide Area Network (PUNWAN) to provide connectivity between state headquarters, Secretarial Area Network, Department Local Area Network, districts, sub-divisions, blocks and villages
- Facilitate estimated 2.5 million Internet connections by 2007, in line with the policy of the Government of India
- Facilitate IT kiosks within the cycling distance of four to five kms, including rural areas, by 2005, through private sector participation. Government of Punjab should progressively make available access to Internet connectivity and e-mail facility in all government offices.
- Launch a programme for training panches and sarpanches at the village level and mayors and deputy mayors at the municipal corporation level.

According to the recommendations of the Working Group on IT for Masses, set up by the Government of India, five per cent of the state's total budget should be allocated for IT induction. Punjab has already set up Department of Information Technology (DoIT). It is proposed that it should be further strengthened in terms of expertise and funds. It is recommended that at least 0.5 per cent of the budget in the first year, progressively

increasing it to two per cent in the terminal year of the plan period, should be utilized for promoting and implementing e-governance.

It is strongly recommended that e-governance of the state should be implemented in a holistic and integrated manner through a monitoring cell, with defined rules and procedures based on principles of equity, responsibility, transparency and accountability. It should be able to monitor the performance and the status of all the projects, departments and ministries against the set targets. In case of non-performance, the monitoring cell will receive an alert signal and the cause.

IT FOR MASSES

The rural population in Punjab constitutes 65 per cent of the State's population. Being predominantly an agricultural state, the quality of life and the health of its economy is largely driven by the performance of the rural sector. Information technology provides new opportunities to tackle problems related to rural poverty, health, illiteracy, unemployment and environmental degradation. The special IT Task Force, constituted by the Government of India, has recommended the use of state-of-the-art information technology for the development of agriculture and rural development, on the lines of the successful Warana project in the Kolhapur and Sangli districts of Maharashtra.

This project effectively demonstrates the contribution of an IT infrastructure to the accelerated socio-economic development of a cluster of 70 contiguous 'Wired Villages'. The project aims to utilize IT to increase the efficiency/productivity of the existing co-operative enterprise, by setting up a state-of-the-art computer communication network and create a data-base of villages on different socio-economic aspects such as health, education, water supply, sanitation and population. It also provides information on agricultural-related schemes, employment generation schemes, and government procedures for getting ration cards, birth and death certificates, etc., to the villagers.

It is proposed that Punjab should adopt the 'Wired Village' concept to network its 12,400 villages with all information and communication facilities, including Internet. To cover the entire state, a total of 138 'Community Information Dissemination Centres' (CIDCs), one each at the block level, should be set up, which will be linked to every village. These centres will also effectively disseminate information related to the 29 subjects transferred to the Panchayats under the 73rd Amendment to the Constitution. CIDCs also function as IT kiosks and will provide direct linkages between the masses and the government. CIDCs will further organize training of panches and sarpanches in the use of IT and its benefits for their day-to-day requirements.

The total investment for setting up such 138 Centres has been worked out to be Rs. 372 crore, at the rate of Rs. 2.7 crore per CIDC. (On an average rupees three lakh per village and one CIDC will cover 90 villages). It is recommended that the Punjab makes efforts to get the project funded by the Government of India. (Government of India has already funded a similar project in the Northeast region of the country at a cost of Rs. 220 crore covering 487 centres). The programme is on a revenue-sharing basis and is to be so formulated that, after an initial gestation period of two to three years, CIDCs will be self-sustaining. It would also provide employment to approximately 25,000 educated youth in the rural areas of Punjab during 2002-2007. The Government of India has already made provision for requisite investment covering 6,000 CICs (CIDCs) to be set up all over the country, as reported in *MIT Report on Tenth Five Year Plan*.

CIDCs will also help in improving productivity and performance of agriculture. Support and services of various stakeholders and extension agencies, such as Punjab Agriculture University, Ludhiana, State Agriculture Department, Mandi Board, Markfed, Sugarfed, etc., and other agriculture-related industries should also be taken up for updating the latest information on products and services, new technologies and practices.

IT can be used in all aspects of agriculture. It can play a major role in crop management, enhancing productivity and crop yields through information on farm practices, seeds, other inputs of production, weather information, enhancing realization, cutting down intermediaries, better pre- and post- harvest management, water utilization and management, pest and disease control, etc. The Land Information System can provide information about markets, food-pricing, imports and exports, tariffs and quotas, underproduction and over production, and physical information about soils, hydrogeology and rainfall, etc. IT applications can be effectively used for management and monitoring of environment resources, pollution warning systems, environmental emergency management systems for floods, forest fires and other natural disasters.

IT can also be suitably employed in small and tiny industries for online and real-time information to help small and marginal artisans in their sales and marketing efforts. This will not only help them earn better and boost their morale, but preserve these rare skills, which otherwise are on the verge of extinction.

The Government of India has proposed the setting up of a network called, Vidya Vahini, to carry the benefit of IT to the students. Today, in India, there are more than nine lakh schools catering to the needs of more than 25 crore students and one crore teachers. Most of these schools have no access to the information age. Under the Vidya Vahini programme, schools and higher learning institutes are proposed to be connected with an integrated voice, data and video network. The Government of India has proposed to introduce this programme in two phases. In the first phase, i.e., in the first two years of the plan, 60,000 schools are proposed to be connected to the network. Punjab should get 5,000 schools networked in the first phase and 5,000 more in the second phase.

It is estimated that rupees two lakh will be required for each school, to implement the recommendation of Government of India, It is also recommended that all these schools should only be from rural areas. Timely and speedy implementation of the project by the state will go a long way in furthering the use of IT for the masses.

RESEARCH, DESIGN AND DEVELOPMENT (RD&D)

Nations investing in human resource development, research & development and high quality university education have achieved worldwide leadership and scholarship. Today, the Quality-of-Life index in those nations is unparalleled as compared to other developing nations. In the liberalized, globalized environment, under the WTO regime, it has become imperative to develop technologies, newer products and services of international quality, to remain competitive. Research and development is the way to meet this challenge. In the field of IT in India, most of the research and development projects have so far been sponsored and funded by the Government of India. However, Karnataka, Andhra Pradesh and Maharashtra have undertaken a few design and development projects sponsored and funded by the respective governments.

RD&D is vital for the growth and development of the IT industry, for Punjab to become a leading IT destination and move up the value chain, Design and development projects with commercial potential should be identified and the participation of the private sector in them encouraged. The state must focus on short-term as well as long-term RD&D projects. Short-term projects with direct applications in industry, involving less risk and a short gestation period, should be taken up on a priority basis. Other important areas include development of software for the computerization of different government departments and application software for rural masses in the local language.

In the longer term, the state must focus on key emerging technologies, such as wireless technology, second generation Internet, software level integration, and motivate MNCs to set up their RD&D centres in Punjab and financial and technical participation of international agencies to leverage their worldwide experience. The concept of subcontracted research with system-integration should be encouraged to help in developing system-integration expertise and design of products.

An exclusive R&D fund has to be set up to formulate and implement these RD&D programmes, Rs. 20 crore may be allocated during 2002-07. In addition, technical and financial support and participation by the Government of India, international agencies, MNCs and private sector are important.

INVESTMENT WITH SUGGESTED SOURCES DURING 2002-2007

Area	Estimated Investment	total	(Rs. in crore)		
			To be funded by Punjab Govt	To be funded by GOI	To be funded by Private sector
Human Resource Development					
a) HRD Quality improvement	60.00		45.00	--	15.00
b) Setting up an IIT	150.00		--	150.00	-
IT Infrastructure					
a) Setting three IT cities at Patiala (Rs. 175 crore), Jalandhar (175 crore and Ludhiana (Rs. 175 crore and upgrading Mohali (Rs. 50 crore)	575.00		115.00	--	460.00
b) Venture Capital Additional fund for IT	30.00		30.00	--	--
E-Governance					
0.5 per cent in the first year to 2.0 per cent in the last year of the plan	188.6		188.6	--	--
IT for Masses					
Setting 138 wired CIDCs at block level	372.00			186.00	186.00
Vidya Vahini Programme (GOI) for 10000 Schools	200.00			200.00	--
Research Design & Development					
	20.00		20.00	--	--
Total	1595.60		398.60	536.00	661.00

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Chapter 14

DEVELOPMENT PERSPECTIVE

While enunciating a development perspective for Punjab, an essential prerequisite is to spell out a vision for the state – the kind of economy, society, polity, ecology and ideology envisaged for it, over a given period of time. This style of dealing with the issue is strikingly different from the usual style wherein the future agenda is set in the light of the evolving scene, particularly with reference to problems that have emerged on the way. The intention is to define and work out a feasible dream for the state and thus go beyond the conventional diagnostic and curative approach.

In its bare essentials, the state has to be not only efficient and progressive economically, just and harmonious socially, democratic and participatory politically, friendly and prudent ecologically, aesthetic and functional spatially, but also civil and sustainable systemically. In this light, one can envision Punjab eventually as a region which is sub-urban, displaying a continuum of rural and urban, agriculture and non-agriculture, with a hierarchy of settlements interlinked by a free-flowing transport network; thereby serving as a stage for what is envisioned. Herein, symbolically, the role of a development architect, social scientist and a professional practitioner gets entwined. Things would have been easy if Punjab were a clean slate to work on. Certainly it is not. This poses a real challenge. The evolved scene has to be redesigned and reconstructed rather than being built anew.

CONTEXT

Some salient features of Punjab may be recapitulated. It enjoys the highest per capita income in the country (Rs. 23,043 against the national average of Rs. 15,562 in 1999-2000), and is highlighted as a model of agricultural development. Here poverty is not an issue; achieving a higher level of economic well-being or becoming more affluent is! People can move to a greener pasture anywhere in the world if the opportunities at home are not attractive enough.

Such was the stimulus which motivated many a native of Punjab to migrate not only to other parts of India, as diverse as newly reclaimed agricultural lands, lucrative urban places or remote forested areas, but also to emigrate to several foreign countries including, the United Kingdom, Canada, United States, Australia and Middle East, among others. This exposed them to the ethos of the developed world. No wonder, the popular development perspective seeks transformation of the state in the mould of a western country. An oft-repeated self-question is: Why cannot Punjab be like the United States, or the United Kingdom, or like Israel, or Denmark, among the smaller countries? The state, of course, cannot go by such a paradigm. It has to fabricate its own model of development, consistent with ecological conditions, cultural ethos and sustainability parameters. Above all, any development perspective envisaged for the state has to be in the spirit of its interconnectivity with other parts of the country, particularly the neighbouring states.

One peculiar feature of the development process in Punjab may be underlined: As soon as a new growth activity is initiated, it picks up momentum, and reaches a plateau rather too soon. The green revolution is one such case. It made a beginning in 1966; by 1985, it had reached a saturation level and has been seeking a new direction, which is more remunerative than the wheat-rice rotation regime. Not much

success has been met on this count. Water depletion in the tubewell irrigated lands and waterlogging in the canal irrigated ones have emerged as serious problems. Likewise, the educational and health infrastructure expanded, excelling the national norms, but when the task of enhancing the quality of service emerged, the response was weak. Sustainability of the development process and providing new channels for its flow are now the crux of the matter. This cannot be ignored as a parameter of the development perspective.

A newly acquired economic well-being soon gets translated into an aspiration for living in an upgraded habitat. One of the most visible outcomes of the green revolution has been a remarkable transformation of village settlements, particularly by way of conversion of kutchha houses into pucca. In urban areas too, a well-designed house located within a modern locality, has become a priority. An urge to live in standard houses with clean and green surroundings has been ignited. Quality habitat, thus, claims inclusion as an imperative of the development perspective.

A statement on development perspective for the state will not be complete if we do not take care of the globalized psyche of its people. Punjab is an anomaly to the students of migration studies. Though well placed economically, it has been a net outmigration state for the last hundred years or more. Though not a coastal state, it has recorded large scale emigration too. Punjab is an extrovert entity, actively interacting with areas all over the world at large. This global dimension of the state has to find a place in any formulation of a development perspective for it.

Finally, as rightly perceived, Punjab is eulogized for the progressive outlook, great dynamism, and exceptional enterprise of its people. It has also a fairly laid out infrastructure base. Virtually any problem it faces, or any situation which constrains its development, can largely be attributed to a management failure. People believe that Punjab can be a model state simply if its political and administrative train is on the right track. Thereby, 'good governance' is underlined as the most critical aspect of its development scene. It is deemed basic to the actualization of all other development perspectives.

What should be the time frame for the realization of the development perspective visualized for Punjab? The faster it is the better for the people, but time targets have to be assigned. In the medium term, it could be placed at 1 November 2016 when Punjab would be celebrating the golden anniversary of its formation; on the short term, it can be placed at 31 March 2007 when the Tenth Plan gets completed; and as a relatively long term scenario, it can be dated as 31 December 2020, in the spirit of a new vision. These three datelines can adopt evolving development dimensions as their top priority: financial recovery as the necessary base (2007); human development (education and health) by 2016; and habitat (environment) by 2020.

PERSPECTIVE OF THE PLANS: 1966-2002

Let us review what has been the development perspective of the successive state plans (Government of Punjab, 1969-2002). Which were the sectors listed as its priority? Which strategies were deemed as most effective for the purpose? Answers to these questions are necessary, as the state has invariably played a pervasive and ubiquitous role in determining the content, pace and quality of the development process in Punjab. Intentions of the government, as evolving over time, can be discerned from the pages of plan documents.

Punjab was reorganized to its present form in 1966. This synchronized with the ushering in of the green revolution. By that time, the state had carried out consolidation of landholdings over its entire space, 59 per cent of the net area sown had been brought under irrigation, virtually all the villages had been covered by agricultural credit societies, the Mandi (Market) Township Act had come into force to facilitate the disposal of agricultural produce, and benefits accruing from research and extension activities of the Punjab Agricultural University, Ludhiana, had started making an impact. A stage had been set which put the state on a fast track to agricultural and rural development.

The years 1966-69 were a phase of Annual Plans, during which the state received special funds for its transformation into a veritable 'bread basket' for the country facing a prolonged and massive food-deficit. Two consecutive drought years of 1964-65 and 1965-66 had worsened the situation in India. This gave Punjab an opportunity to prove its mettle. It met the challenge and contributed 61 per cent of wheat and eight per cent of rice procured for the public distribution system at the national level in 1968-69.

The Fourth Plan (1969-74) document highlighted that the state could take pride in having saved the country from a grave food crisis; and for itself, having successfully stabilised the strides made in the green revolution. Its efforts at diversifying the economy towards industrialization were yet to make an impact. Inadequacy of finance, shortage of raw materials, and gap in power supply, to the extent of less by one-third of demand, were adduced as the factors responsible.

Taking a cue from above, the Fifth Plan (1974-79) aimed at a bold programme of 'industrialization and development of infrastructure', so as to accelerate the pace of economic growth. Massive investment in power was deemed essential for the purpose. The assessment was that ultimately it was industry which could reduce the disparity in the development level of different parts of the state.

The Sixth Plan (1980-85) introduced a new idiom seeking transformation of Punjab into a 'model state' during the next ten years. The main components of such a vision included diversification of the economy in favour of industry; generation of jobs for the unemployed and underemployed; reduction in regional, rural-urban and caste-based disparities; and improvement in the overall quality of life. All this was to be achieved through an accelerated rate of economic growth, an efficient and honest administration, and a decentralized pattern of planning and development.

The Seventh Plan (1985-90) promised 'growth with justice'. A major thrust was envisaged for correction of distortions that may have crept in during the preceding plan periods. These included, for example, reclamation of degraded agricultural land, extension of irrigation in the submontane and other backward tracts, improvement in delivery of educational and health facilities, and promotion of industry, particularly in border districts. Augmentation of power supply and initiation of environmental improvement schemes were listed as priorities. The two annual plans, during 1990-92, carried forward the ongoing development schemes apart from initiating some new ones, as financed by the Central Government.

'Generation of additional employment' was adopted as the core concern of the State's Eighth Plan (1992-97). The three border districts of Gurdaspur, Amritsar and Ferozepur, which were the major victims of the statewide militancy during the eighties, were in special focus. Again 'promotion of industry' was identified as an effective route to the realization of this objective. Diversification of agriculture, in general, and of the cropping pattern, in particular; improvement of human resource through

education, health and training; and extension and modernization of basic infrastructure were among the other tasks listed. In respect of institutional reforms, decentralized planning at the district level was to receive a further impetus; private investment was to be encouraged in all sectors, and viability of the public sector undertakings was to be ensured.

The Ninth Plan (1997-2002) enumerated the following as the broad lineaments of its strategy: vigorous thrust to agriculture and rural development; a great push to irrigation and power sectors; improvement in quality of life in both villages and towns; creation of additional employment opportunities; and social justice for the disadvantaged. Micro-level planning was to receive special attention, more so in the border districts.

The Tenth Plan (2002-2007) strategy is virtually an iteration of what was contemplated in the Ninth Plan. Diversification of agriculture, as also of the cropping pattern, has been projected as the measure to meet the challenge posed by the stipulations of the W.T.O. Various development projects, such as Integrated Watershed, Health Care Systems, and Water Supply and Environmental Sanitation, aided by international agencies, are to continue.

An overview of the plan documents lead us to the following conclusions:

- Perspective and strategies indicated for various plans remained virtually the same: diversification of the economy towards industry, of agriculture towards non-farm activities, and of the cropping pattern away from the stubborn wheat-rice rotation; irrigation and power as the mother sectors; and unemployment as the main challenge.
- Theoretical underpinnings of the plan documents remained unspelt. Only the Sixth Plan projected a vision of making Punjab a Model State. The instrumentalities indicated were a reformed administration and decentralized planning, with a flavour of good governance.
- The successive plan proposals, by and large, echoed the issues highlighted at the national level. Specificity of the state level concerns was not projected in a bold manner. The plan documents were drafted with a bureaucratic ethos; the input emanating from the research institutions and university academics was meagre.
- Sub-plans for the backward areas, including the submontane tract, flood-plains and border districts found special place in the documents. This is as it should have been. It was, however, not clear as to how these sub-plans were integrated with micro-level planning.
- Expenditure exceeded outlay during most of the plan periods. The state could arrange additional resources from the Planning Commission, or was able to mobilize these at its own level. The Ninth Plan was an exception, when the expenditure incurred was only 77 per cent of the approved outlay. Irrigation and power accounted for about one-half to more than two-thirds of the expenditure under various plans. Ironically, both were losing sectors financially, under the twin effect of subsidies involved and pilferage.

The status of the sectoral developments of the state reflects and mirrors the implementation of plan provisions. It is necessary to review the situation in each case and to enunciate sector-specific development perspectives. This is precisely what is being attempted here. An iteration of some of the bold facts appearing in various chapters of this development report becomes unavoidable, at places, in any such exercise. Any information or data is duly acknowledged at the very outset.

SECTORAL PERSPECTIVES

Economic Growth and Regional Disparity

The most worrisome feature of Punjab economy today is the drop in its annual growth rate, from 5.3 per cent during 1980-81 to 1990-91 to 4.7 per cent during 1991-92 to 1997-98. By comparison, growth rate at the national level moved up from 5.6 to 6.9 per cent during the same period. In sympathy, the annual increase rate of the state's per capita income also came down from 3.3 to 2.8 per cent.

A further perusal of data shows a regular decline in the growth rate of agriculture in Punjab since 1985. The state's share in the contribution of wheat to the Central pool declined from 45 per cent in 1980-81 to 36 per cent in 2000-01, and that of rice from 73 to 58 per cent during the same period. The livestock sector, which was earlier having an upswing, has been decelerating since 1997. The same has been true of the manufacturing sector. Electricity generation rate also suffered a decrease after 1990. Construction, transport, and trade sectors did display some buoyancy. On the whole, the nineties emerge as a difficult phase for Punjab economy. Why did things come to such a pass?

The unhappy downward turn of Punjab economy can be traced to 1984-85, when it became a 'revenue deficit state' from the status of a 'revenue surplus one' (Government of Punjab, June 2002). The Government of Punjab attributes this to 'an ever increasing salaries and wage bill of the employees (particularly since implementation of the Fifth Pay Commission recommendations), mounting debt burden, heavily subsidized social sector (education and health) and economic services (irrigation and electricity), slow growth of revenue, and loss-making public sector undertakings' (Government of Punjab, March 2002). The difficult political situation during the eighties has adversely affected both the imposition and collection of taxes. This was more so during the prolonged phase of president's rule, when the caution was not to create any situation that could add fuel to the fire. During the tenure of elected governments, 'subsidies on populist lines' made their own contribution to worsening the situation. Meanwhile fiscal deficits of the public sector undertakings were also mounting and adding to the financial misery of the government. The recourse followed was to go in for public borrowing in a big way, instead of curing the malaise. Interest payment, as a percentage of revenue, moved up from 16.8 in 1990-91 to 29.4 in 2000-01. This was the highest for any major Indian State; the all-India figures were 13.1 and 17.6 per cent respectively. Investment on development suffered badly. The development expenditure, as a percentage of total expenditure, steeply fall from 71.9 in 1980-81 to 54.5 in 1997-98, and further down to 46.5 in 1998-99. Implications of all this for the state's economic growth rate are not difficult to understand.

The fiscal programme of the Punjab Government envisages an annual economic growth rate of 5.5 per cent during the Tenth Plan, at constant prices. With the current population increase rate being about 1.8 per cent, the annual rise in per capita income would be of the order of about 3.7 per cent. The Planning Commission expects Punjab to achieve a higher annual growth rate of 6.4 per cent (agriculture 4.1%, industry 8.1% and services 8%). This calls for a greater effort than the state has assigned to itself. The government proposes to stimulate the economy by correcting the fiscal imbalance, and thereby making available a larger share of the budget for development. Major steps contemplated include: reforms in the area of sales tax; revision of user charges of transport, irrigation, higher / professional education, secondary / tertiary health care, and drinking water supply; and gradual privatization of public sector undertakings.

In any situation, economic growth rate is a function of three factors: investment level, incremental capital–output ratio (investment required for an additional per unit production), and rise in the value added (difference between output and input per unit of production). In India, gross fixed investment in the economy is about one-fourth of the gross domestic product; of this, 28 per cent is by the public sector. For want of separate information about Punjab, we may assume that a similar situation prevails here. The relevant message for our purpose is that, notwithstanding the crucial role of public sector investment in development (particularly infrastructure and social services), the private sector is more critical in terms of its share and spread of investment. Private sector investment, however, is selective of those locales which are free from law and order problems, offer quality infrastructure, and provide skilled labour imbued with a strong sense of work culture. Any scheme of putting Punjab economy on an expressway has to address itself to these issues. As far as 'incremental capital– output ratio' and 'value added' aspects are concerned, technological upgradation and efficiency promotion emerge as the main prerequisites.

Mercifully, the picture of Punjab as a relatively prosperous and progressive state still persists in the popular mind. As noted earlier, there are valid reasons for it. This must not lead one to believe that there are no regional disparities within; these are rather striking, as measured by any set of economic and social indicators (Gosal and Krishan 1984). In specific, the central belt of Punjab, covering Amritsar, Kapurthala, Jalandhar, Ludhiana, Fatehgarh Sahib and Patiala districts, is relatively the most developed. It is characterized by a very progressive agriculture, significant concentration of industry and a high level of urbanization. The Amritsar-Delhi railway track and the Grand Trunk road form the economic back bone of this zone and provide it with the necessary dynamism. The northeastern zone, comprising Gurdaspur, Hoshiarpur, Ropar and Nawanshahr districts, is comparatively the least developed. This is attributed to its dissected and undulating topography, small size of landholdings, and relative isolation of some of its parts. The scene is, of course now changing for the better, with the World Bank sponsored Kandi Area Integrated Watershed Development Project being under way, industry coming in a significant manner in Hoshiarpur and Ropar districts, and infrastructure getting greatly strengthened in areas around Chandigarh. The southwestern zone, comprising Firozpur, Moga, Muktsar, Faridkot, Bathinda, Mansa and Sangrur districts, are acquiring new dimensions of development. It has made noticeable progress in agriculture. Industry is also picking up. The most important factor accounting for its agricultural advancement has been the relatively large size of landholdings, promoting mechanisation. Industrial development is facilitated by the availability of agricultural raw materials, particularly cotton and rice.

Within this broad framework of regional disparities in Punjab, the government has identified three kinds of backward areas in the physical structure of the state: the hilly and foothill Kandi tract; the flood-plains of the Ravi, Beas, Satluj and Ghaggar, and the border belt. Each of these suffers from its own specific physical and locational problems. The Kandi tract has an undulating and degraded topography; the flood-plains are not free from the fury of river-waters during the rainy season; and the border belt with Pakistan is the most distant from the state capital and a typical periphery. Special attention to such problematical areas is in order.

Rural Development and Agriculture

Among the Indian States, Punjab holds place of pride for its outstanding achievements in rural development. A healthy mix of environmental, institutional and technological factors explains this situation, evolving since independence and picking

up pace after the state's reorganization in 1966. The most striking feature of the Punjab model is the government's manysided participation in the development process (Chadha, 1986, p.338). Imbedded in the scheme of things was the adoption of agriculture as the lead sector, not only in consonance with the physical attributes of the state, but also as a response to the national demand for food. With political power in the state having been consistently rural based and drawn from a farming background, rural development and agriculture have remained a priority. What is more, a right sequence of policies was followed for the purpose. Beginning with consolidation of landholdings, followed by reclamation of new agricultural lands and synchronous extension of irrigation through Bhakra canals, and the process being further strengthened by the green revolution strategy of biochemical inputs (high yielding variety seeds, chemical fertilizers and irrigation) and mechanical inputs (tractors, threshers and harvester-combines), Punjab agriculture continued making rapid strides over the years. The agrarian structure characterized by middle level peasantry, with landholdings of two to four hectares, and predominance of owner cultivators, was no less important a factor for the success of this process. Exogenic factors also played a role in the modernization of Punjab agriculture. Exposure of the state to external influences through emigration to foreign countries, migration to other parts of India, and tradition in army service, had at least a three pronged effect: brought in remittances which were used for augmenting agricultural infrastructure at the household level; reduced pressure on agricultural land, thereby saving the landholdings from getting very small; and stoked a tendency towards achieving higher levels of opulence,

Most important to the whole process was the government's thrust on rural-agricultural development. The main components of the strategy included: extension of irrigation, rural electrification, rural link roads, rural focal points providing a variety of services, closely spaced agricultural market centres and, above all, an assured provision of credit and agricultural inputs. Widespread infrastructure, which could boost agriculture, was made available. As part of national policy, the minimum support price for wheat and rice, the state's two major crops, played a significant role in sustaining agricultural development, and thereby raising rural incomes. In 1999-2000, only six per cent of rural households in Punjab were below the poverty line, as compared with 27 per cent in rural India.

The emerging scene of rural Punjab, and within that of agriculture, is not free from some serious concerns. Notwithstanding a commendable quantitative expansion of a variety of services, notably schools/colleges, dispensaries/hospitals, veterinary centres, electrification, link roads, and focal points, the quality of service provided in every case is far from satisfactory. Schools and dispensaries do not function properly, electricity suffers frequent breakdowns, link roads are not properly maintained, and several of the focal points are non-functional. Upgradation of quality in service provision is now the greatest challenge for any effort to improve the situation in rural Punjab.

On the agricultural front, the persistence of wheat-rice rotation, despite efforts at promoting diversification of the cropping pattern, is causing a serious damage to the state's natural resource base. Rice, in particular, is a water-intensive crop and is not eco-friendly for Punjab. Its popularity, however, could not be contained, because it is not only a lucrative crop but also of assured returns. The consequence is there for every one to see: water-table depletion in tube-well irrigated areas and waterlogging in canal irrigated ones. The question remains: How to wean the Punjab farmer away from the wheat-rice rotation? A serious effort to this effect was made as early as in 1986. The situation evolved to the contrary, with the rice area increasing from 17 to 26 lakh hectares, and wheat area from 32 to 34 lakh hectares during 1985-86 to

2000-2001. Short-term private economic gains are ignoring the long-term public ecological cost.

'Precision diversification based on agro-ecological zones of Punjab', is now being recommended. In precise terms, rice is to be shifted from tracts 'where sandy and loamy soils predominate'. Production of basmati rice, which is less water-intensive, should be encouraged through assured support price. At least 20 per cent of the area under wheat and rice should be shifted to some other crops, such as maize, oilseeds, sugarcane and fruits/vegetables or other farm enterprises (Johl and Ray, 2001, p.251). The corporate sector, in linkage with farmers' associations, should be asked not only to improve quality of agricultural products, but also promote agro-processing industry.

Despite a visible improvement in the quality of life in Punjab villages, particularly by way of conversion of kutcha_houses into pucca ones, much remains to be done for environmental improvement of the rural habitat. Introduction of 'Unnat Gram' scheme by the Punjab Government, during the Eighth Plan, was one creditable effort in this direction. Pavement of streets, construction of drains, disposal of sullage water, metalling of phirnis, and provision of water borne latrines in each house were the main planks of this scheme. Shortage of funds permitted only a limited success. In that context, the old abadi part of every village is invariably very congested, poorly maintained and ecologically deficient. A culture of healthy living needs to be promoted. Upgradation of the quality of rural habitat remains an unfinished agenda item on the development chart of the state. An effective course would be to pool the available funds under all the district level schemes and disburse these by following a policy of 'one village, one scheme' at a time. As at present, funds are spread too thin to cover a number of schemes in a village.

Towards that goal, it is suggested that a scheme of planned rural residential colonies be formulated and implemented at the focal points, to begin with. Each of these colonies could be designed for about 250 or more housing units of varying sizes depending upon the demand at each site, with provision for expansion in future. The locality must become a model in house design, provision of services, and overall maintenance. A component of commercial outlets could be included as part of the scheme, and thereby cross-subsidize the residential component. The scheme is visualized as self-financing.

It may not be known to many that the proportion of the Scheduled Caste population in the total is the highest in Punjab—around one-third—among Indian States. This section of society is characterized by a significantly higher birth rate, lower literacy rate, and less incomes/wages. The pregnancy rate, that is, the percentage of eligible women pregnant at any time, is 6.1 in the case of Scheduled Castes as compared with 3.5 for the rest of the population. Most of them may be above the poverty line, but in comparison with other sections of society, their economic upliftment remains a task to contend with. Family planning, education and health are the major issues in their case.

Putting things together, enhancement of the economic well-being already achieved, upgradation of the quality of life, improvement of the habitat, care of the Scheduled Castes, and preservation of the natural resource base, emerge as the main assignments in the context of rural Punjab, which accounts for almost two-thirds of the state's population. The precise tasks can be defined as diversification of the rural economy for employment generation, in particular; diversification of the cropping pattern, with focus on water and soil management; improvement in the quality of service provision, especially in respect of health, education, water, electricity and

transport; and upgradation of the habitat, partly by raising planned residential colonies, on a demonstration basis.

Active involvement of the corporate sector and non-government organizations (NGOs) can be an effective measure for this purpose. Both can play a role in generating awareness about the development programmes and schemes launched by the government; imparting training to the youth for self-employment; managing natural resources; and promoting education. The corporate sector can, in addition, assist in marketing agricultural produce, and providing employment to the youth trained by them for a given vocation.

Above all, an effort can be made, on organized lines, to involve non-resident Indians (NRIs) for the development of their native villages. Emigration from several parts of Punjab has been an ongoing process for long, and many emigrants have garnered big fortunes in their new abodes. The willing ones among them can be encouraged, facilitated and given incentives for adoption of their native places for upgradation into 'model villages'.

Urban Development and Industry

With 34 per cent of its total population living in towns/urban agglomerations in 2001, as compared to 27.8 per cent at the national level, Punjab is one of the more urbanized states of India. The state's 83 lakh urban population is distributed among 157 towns/urban agglomerations-139 statutory and 18 census ones. Fourteen towns/urban agglomerations have a population of at least one lakh each, and together account for 58.4 per cent of the total urban population. The urban growth rate of Punjab, 37.6 per cent during the nineties, was significantly higher than 29 per cent at the national level. International experience suggests that urbanization gets a momentum in regions after they became 30 per cent urban and simultaneously achieve a per capita income of US \$ 500. Punjab has been one such case since 1991. Projections are that the state would become urban majority by 2020. This would reverse the popular image of Punjab as a predominantly rural entity. The implication is that urban issues are going to gradually assume greater importance. A change in the thrust of policy would be inevitable.

Some redeeming features of Punjab's urbanization are worthy of note. Towns are almost uniformly distributed and closely spaced; their average spacing is about 20 km and this figure is the lowest for any state, barring Kerala and Goa. The impact of agricultural development and associated agro-based industry is evident.

As an outcome of this, Punjab is distinguished by a strong urban-rural linkage and a narrow urban-rural gap. In fact, average assets per household in rural areas were recorded as double those in urban places. The proportion of population below the poverty line, at around six per cent, is virtually the same in rural and urban areas. An urban-rural continuum has been taking shape, which is most manifest in the corridor development along the roads connecting big cities, such as Ludhiana, Jalandhar and Amritsar. A tendency has been among several agricultural landowning households to raise an additional establishment in a nearby town to avail of better facilities and services is observed. This is giving rise to a class of people whose economic interests are partly rural and partly urban.

Despite some efforts at control, much of the physical growth of towns has been taking place in a haphazard manner. Not only cities but also small and medium towns are subject to this malady. A change in the morphology of all types of towns has become necessary to meet the increased demand for space for new land uses, to

relocate facility points to alternative sites, and to cope with the fast increasing number of motor vehicles on the road. The response is visible in the emergence of new residential colonies, re-siting of old grain markets and bus stands, and laying out of bypasses to divert inter-town traffic.

Illegal encroachment on land is a pervasive malady in all towns. The affected localities could be commercial, residential, institutional, industrial, for that matter any. One manifest expression of this tendency is the proliferation of slums, mostly on public land. In 2001, the slum population accounted for about one-fifth of the total living in towns, each with a population of 50,000 plus.

While slums are an index of scarcity of formal housing at an affordable price, inadequacy of several other basic urban services is no less glaring. Even in the four municipal corporations of Ludhiana, Amritsar, Jalandhar and Patiala, nearly one-third of the population has no access to safe water supply and more than one-half have to go without the facility of sewerage. In 32 nagar panchayats, safe water supply is not available to more than one-half of the population and 95 per cent are not covered by sewerage facility. No less than 40 per cent of roads and streets in Punjab towns require extensive repairs. This is the picture of the quality of life in the towns of the most prosperous state of India!

Financial crunch, which the urban local bodies are facing, is at the root of this sorry state of affairs. An extremely low recovery rate of user charges is one major cause of this situation. The aggregate income of urban local bodies from water supply and sewerage charges during 1996-2001 was only Rs. 201 crores as against the projected figure of Rs. 1353 crores, that is hardly around 15 per cent. Even if only the operation and maintenance cost were taken into account, this percentage would have risen to just 47. Actual expenditure on provision of all obligatory services was found to be only around 40 per cent of what was projected, with serious implications for both quantity and quality.

What is the way out? Quality of life in the towns of Punjab demands immediate attention. This requires not only a massive input of financial resources, but also serious reform in management. Effective implementation of the Nagarpalika Act is imperative to achieve that goal. Devolution of decision making and financial powers to urban local bodies has so far been hesitant and piecemeal. Parallel functioning of the state apparatus and the elected body in managing urban affairs is replete with problems of co-ordination in every town.

Urgent reform in the management of municipal finances is called for. Most essential is to rationalize rates of user charges and improve their collection. Selective involvement of the private sector on the lines of the water supply and sewerage project at Tirupur (Tamil Nadu); maintenance of streetlighting, solid waste removal and local transport, etc., at Rajkot (Gujarat); solid waste management at Hyderabad; and preparation, distribution and collection of bills at Ludhiana, can help in reducing the administrative and financial burden on urban local bodies, in addition to improving the quality of the service provided. 'Floating of municipal bonds to finance urban infrastructure, as has already been done by Ahmadabad, Bangalore, Hyderabad and some other municipal corporations', is still another way of augmenting the financial resources of urban local bodies. Involvement of community-based organisations is also valued today as an effective strategy towards the coverage and quality of service provision.

Perspectives on urban development vary. Some express their preference for aesthetics of the city, by way of its beautification in diverse ways. Another paradigm

shifts in favour of healthy cities, providing high-quality services. Still another view cherishes cities as dynamic economic entities, attracting a variety of activities, generating employment and incomes, and yielding revenues for their proper maintenance. A perspective for Punjab towns can be on similar lines: well designed in physical lay-out, equipped with a delivery system of quality services, and promising ready employment, through industry in particular.

The industrial structure of Punjab has remarkably expanded in size, diversified in composition, and dispersed over space since 1966. Even during the politically difficult eighties, the state did not lose its industrial momentum. A long-term view of 1966-2001 shows that the number of small-scale units multiplied more than 25 times, from 8,023 to 2,00,603; and large and medium scale units by more than five times from 122 to 638. The growth of food processing, cotton ginning, hosiery knitting, metal processing, machine tools, transport equipment, and furniture production units has been phenomenal indeed. Both small and large/medium scale units have been dispersing not only to less industrialized parts of the state as a positive response to institutional incentives, but also to rural areas wherever infrastructure and accessibility posed less problems. Around 60 per cent of the large/medium scale units in Punjab today find a village location, especially along the trunk rail and road routes and around big cities, such as Ludhiana, Jalandhar, Amritsar, and the Chandigarh Union Territory.

Nevertheless, regional disparities in industrialization persist and their degree varies by the type of industry. Ludhiana, Patiala and Ropar districts account for one-half of the industrial production in the state. Industries using bulky raw materials, such as steel reolling and metal products, or requiring specialized skill, such as hosiery, silk textiles and transport vehicles, showed a weaker tendency to disperse. On the other hand, direct consumer goods industries, such as food processing, electrical items, and furniture have dispersed widely. Notably the eastern part of the state today is overshadowing its western counterpart, which previously was more industrialized. This is a reversal of an established spatial pattern explained, among other factors, by the presence of a sensitive international border on the west and the location of the state's capital to the east.

Punjab cannot be described as industrially backward as was the refrain some twenty-five years ago, but there can be no slowing down on this front; rather, what is needed is acceleration. This is necessary for hastening the shift from agriculture to non-agriculture, by generating new employment opportunities, and also for reducing regional disparities. What is required is a further strengthening of backward and forward linkages of industry with agriculture.

Such a scheme of things requires a 'SWOT' (strength, weakness, opportunity and threat) analysis of the industrial scene of Punjab. The state is strong in agricultural raw materials, infrastructure base, skilled labour, dynamic entrepreneurship, and high-income/consumption level of the people. On the other hand, its weakness lies in its location on the border with an unfriendly country, a peripheral position distant from major national markets, absence of minerals, and relatively low industrial wage rates associated with the predominance of unorganized small scale units. A sizeable section of industrial labour here is migrant from the low income states, such as Uttar Pradesh and Bihar. They agree to work on low wages, and thereby establish an income threshold which does not find favour with the local labour. This is one of the reasons which discourages the local unemployed from seeking an industrial job. None the less, opportunities for industry are rightly being extended through a variety of government incentives and concessions. But then, the stipulations of WTO have

recently emerged as a threat to industry in the state. Punjab's industry is now facing serious competition not only from within India, but also from other countries.

Hence, as a perspective for an appropriate framework for accelerating the process of industrialization in Punjab, three measures have become essential: (i) identification and prioritization of those industries for which the state is more advantageously placed; (ii) modernization of the managerial style and upgradation of the technological level of industry, presently entrenched in the culture of unorganized small-scale industry; and (iii) provision of special impetus to information technology, both as a strategy for employment generation, and for information dissemination for usage in industry at large. Industries for which the state is favourably placed include: 'liquor and malt, dairy products, leather goods, blankets, carpets and rugs, hosiery and readymade garments, cotton ginning, cotton textiles, chemicals, paper items, and wood processing'.

Beyond this general overview, there are several other critical areas which call for attention. The foremost is to work for a co-ordinated development of large, medium, small and tiny industries. This can take several forms: '(i) small scale industry producing component parts, as in bicycle industry, to be refurbished and assembled by large scale industry, or the other way round, as in the case of computer assembling; (ii) large industry helping the small industry in technological upgradation and human resource development, by providing training facilities; and (iii) both large and small industries co-functioning in industrial parks, equipped with modern infrastructure facilities with both going in for cooperative marketing and ensuring strict quality control and both jointly running professional courses for training the educated unemployed'.

The corridor industrial development, proliferating along the trunk routes, calls for special attention. Although welcome as a dynamic feature of industrialization, it is not without some attendant problems, particularly those pertaining to transport mobility, environmental quality, and service provision. Industry, along the transport routes, should be made to grow in the form of a cluster rather than a ribbon. Such clusters can be developed on planned lines, in proximity of railway stations on the route of the corridors. Each cluster can specialize in a particular kind of industry.

Finally, the basic issue is: How to make Punjab investment-friendly for industrial development? On strategic lines this question can be rephrased as: How to attract the prospective industrialist to the state? Involved here are not only factors of location of an industry, but also considerations of the quality of life at the place which may attract the industrialist. Therefore, the most effective strategy would be to raise new planned industrial towns in the proximity of Ludhiana, Jalandhar, Amritsar, Bathinda and Patiala. These should be equipped with first rate infrastructural facilities for industry and quality services for daily life. An uninterrupted flow of electricity is vital for such a scheme of things.

Employment

Providing gainful and high-quality employment to the unemployed and new entrants to the labourforce is one of the main targets of the Tenth Plan. Though relatively the most progressive and prosperous state of India, Punjab is not free from the twin maladies of unemployment and underemployment. A sizeable section of the agricultural population is being rendered surplus due to a regular decline in the size of landholdings, along with the rapid growth of population. The rural service and artisan castes are finding their vocations inadequate and less rewarding. Educated among the rural youth are generally keen to get an urban job. Matters are no better in

urban areas, where an increasing number of local unemployed is being joined by unemployed migrants from rural areas. The size of registers at employment exchanges is swelling.

The employment context of Punjab significantly changed after its reorganization in the present form in 1966. Agricultural migration to newly reclaimed lands in other parts of India, which has been continuing since the closing decades of the nineteenth century, virtually came to a halt. Recruitment in defence forces was regulated on the basis of the share of the eligible population in different states in 1974 and this was to the disadvantage of Punjab. The number of ex-servicemen, seeking re-employment, is much larger than the new entrants to the defence forces. Meanwhile, avenues of emigration to other countries remain regulated.

The National Sample Organisation recorded the unemployment rate of Punjab at 4.2 per cent in 1999-2000, as against 7.3 per cent in India. By that token, there are around four lakh unemployed persons in Punjab. The number of the underemployed is placed at another five lakh, going by the percentage of marginal workers at 5.4, as recorded by the 2001 Census.

The compound annual growth rate of employment in Punjab, during 1997-2002, was only 0.7 per cent, against the growth rate of the labourforce at 2.3 per cent. This growth rate of employment was the lowest for any State of India, and much below the national average of 2.4 per cent. A rule-of-thumb- estimate would suggest that the economic growth rate, should be three times the population growth rate, if unemployment were to be taken care of. The annual economic growth rate of Punjab had been in the vicinity of 3 per cent during the nineties while the population growth rate had been around 1.8 per cent. That explains the rise in unemployment rate over the years, although at a moderate pace. It also suggests that the state must aim at an economic growth rate of at least 6 per cent, if the stock and flow of unemployment is to be managed.

Unemployment in Punjab is essentially educated in nature, 61.6 per cent being matriculates or above. Nearly one-fourth of them are technically, or professionally trained, being diploma holders, engineers, trained teachers and doctors. Educated unemployment is growing faster in rural than in urban areas. How to generate jobs and how to prepare the educate youth for self-employment, is the question to reckon. The typical recommended line of action is diversification of agriculture to dairying, pom-culture, bee keeping and fishing. There is a fervent achieve to emulate Denmark which during the ninetieth century swiftly shifted from grain farming to dairying, figgery and poultry, as soon as Europe got flooded with grains from North America, Argentina and Baltic States (Kahlon, 2001, p.89).

As matters stand, it is most desirable that the pace of industrialization should be accelerated. Incentives on this count have produced positive results and need to be continued. Small-scale industry is to be preferred in view of its labour-intensive character. With 20 per cent of total industrial investment, it accounts for 80 per cent of industrial employment in the state. As detailed above, its integration with large/medium scale industry is also very necessary.

For this, industry must find its rightful place in district planning. This requires a meaningful co-ordination between different government departments. For example, planting of trees by the Forest Department could be linked with promotion of furniture manufacturing by the Industries Department, for their utilization in local schools by the Education Department.

Though in an incipient stage today, the Information Technology (I.T.) industry has all the potential of rapid growth and can provide quality employment in large numbers. The manpower requirement for this industry during 2002-2007 has been projected at 90,000. Now it devolves upon the Government of Punjab to provide for training this number of high quality manpower, within a span of five years.

Construction is another activity which can generate jobs in bulk in both secondary and tertiary sectors. It would be most advisable to go in for a 'new city' project. This should preferably be located in the Doaba region but in close proximity to Ludhiana. It could attract large investment from the NRIs, offer jobs in thousands, apart from reducing the pressure on Ludhiana. Revival of the dormant proposal of Ranjitnagar as the site could be considered.

In addition, we might explore some additional avenues of employment in other spheres and in different ways. Considering the relative prosperity and life-style of the people of Punjab, there is considerable scope for promoting fast-food joints on modern lines. The private sector can additionally be harnessed for the provision of security, maintenance and local transport services on organized lines. In the primary sector, introduction of planters, transplanters and (potato) diggers may tempt even educated youth to join their family vocation. For females, we could encourage part-time employment in such divisible jobs, as office work, teaching, and health services.

Above all, employment exchanges should not remain simply registration centres of the unemployed. They must do the job of data analysis of the qualifications of the job-seekers and the kind of placements they are looking for. On the other hand, the unemployed youth must have greater access to information about the kind of jobs available in the market, the level of education required in each case, and the facility of loan if one opts to go in for self-employment. One potential skill in which the educated unemployed youth can be trained is 'rural marketing'. Creation of additional jobs in teaching will also help.

Education

That Punjab, which ranks first in per capita income, is the tenth among Indian States in terms of literacy, is a socio-economic anomaly. Here is a case of incongruity between economic and social dimensions of development. In the 2001 Census, 70 per cent of Punjab's seven-plus population was recorded as literate as compared with 91 per cent in Kerala and 77 per cent in Himachal Pradesh. The all-India figure was 65 per cent.

A snapshot of education in Punjab is as follows:

- Practically every village in Punjab has a primary school, a middle school within 2 kms, a high school within 2.5 kms, and a senior secondary school within 7 kms, thus exceeding the norms set by the Government of India. Of the nearly 40 lakh school children, 80 per cent attend government schools, highlighting the contribution of government to the spread of education. No less than 78 per cent of the children, who join a school, drop out by the time they reach senior secondary level, and one-half of those who appear in the matriculation examination, as regular students, fail to pass. This is a colossal waste of educational effort on any count!
- The fast growing popularity of private English medium schools, more so in rural areas, puts a question mark on the quality of education provided by government schools.

- With six universities (two general, one technical, one medical, one veterinary, and one agricultural) and 287 colleges of all types, the state is well served by higher level educational and professional institutions. One-third of the colleges are located in rural areas. The number of graduate and post-graduate students approaches two lakh, with females exceeding males. Scheduled Caste students account for about one-tenth of all students in colleges/universities, whereas the Scheduled Caste population around one-third of the total.
- Government colleges account for only about one-fifth of the 223 general category colleges in the state. Most of the engineering colleges are run by the private sector, and medical colleges by government.
- As much as 99 per cent of the primary education budget goes towards disbursement of salaries. The corresponding figures are 90 per cent for secondary education, 71 per cent for college/university education, and 66 per cent for professional institutions. Paltry sums are left for infrastructural facilities.
- The state outlay on education was 7.2 per cent of the total under the Fourth Plan (1969-74). It declined to 2.9 per cent in the Ninth Plan (1997-2002). In an effort to redress the aggravating situation, the Tenth Plan (2002-2007) proposals provide an outlay of 6.1 per cent for education.

Improvement in the quality of school education, particularly in rural areas, is the most crucial item in the sphere of education in Punjab. The state is saturated, as far as the distribution of schools is concerned; it is the quality which is in short supply. The Punjab Education Policy 2000: Programme of Action indicates that the government is aware of the gravity of the existing situation. A variety of necessary proposals to strengthen the infrastructure, upgrade the quality of teachers, and improve management of school education has been listed. This augurs well for the reform of school education in Punjab.

We may, however, review here a moot suggestion made as part of the state's new education policy. While the decision to restructure the present four levels of school education (primary, middle, high and senior secondary) to two levels (elementary and secondary) is most welcome, the proposal to upgrade every primary school to elementary school does not appear feasible. The purpose of education would be better served if a policy of consolidation rather than of expansion, as at present, was followed. At the first stage, it would be advisable to upgrade only centrally located primary schools to the level of elementary schools, each of which is surrounded by three already existing primary schools. Only at a later stage, the decision about upgradation, or continuation, or closure of the remaining primary schools could be taken, in the light of the experience gained.

Under the new dispensation, it would be advisable if the elected bodies, that is, the village panchayats and nagarpalikas, were asked to regularly monitor the functioning of the schools. The policy document is silent on this issue. Mention has been made of the village- and town-level education development committees; absence of any reference to the elected local bodies is rather intriguing. In all fairness, involving the existing institutions is always better than creating new ones.

Punjab is no less happily placed in terms of the number of institutions of higher education, both general and professional. Again, while proximity is no issue, quality certainly is. Involved here are matters relating to infrastructural facilities, professional commitment of the teachers, and the desired culture of management. Faced with a severe resource crunch, the state government has recently been extending wide

space for the entry of the private sector into higher education, more so in the professional field. To what extent is increasing privatization of higher education desirable and what will be its eventual outcome? This is not easy to predict. Should we assume that there is little room for reforming higher education and making it cost-effective within the public sector? In any case, management of privatization, particularly in higher education, is a serious obligation of the government. Equally important here is to understand that the quality of higher education and that of school education are interlinked. Teachers, of all disciplines and status, have to come through the channel of higher education and its quality is a function of the kind of students which school education produces. It is the 'quality of the teacher' which ultimately determines the quality of the entire system.

Health

On almost all parameters, the health infrastructure in Punjab has expanded phenomenally since 1966. 'A new hierarchy of health outlets, including referral hospitals, community/primary health centres, sub-centres, mother and child care units, and family planning clinics has evolved in both rural and urban areas, through public sector'. Besides, universities and public sector undertakings too provide health facilities to their employees.

No less spectacular has been the expansion of the private sector in health services. 'Its participation is no longer confined to individual private clinics but extends also to hospitals, polyclinics, diagnostic centres, nursing homes and specialty premises'. The organized private sector, in addition, caters to the health needs of its employees.

A perusal of data and information about the health sector in Punjab brings out the following facts:

- During 1966-2001, the number of health institutions in the public sector multiplied 4.5 times, from 496 to 2,229. This rate of increase was three times faster in rural areas than in the urban. Most rapid growth took place during 1973-83, when a large number of sub-centres were opened all over the state. A kind of plateau was reached by 1985. The establishment of the Punjab Health Systems Corporation in 1996-97, through World Bank assistance, is a major development of recent years in this context.
- The availability of medical and paramedical personnel also recorded an impressive increase: The number of doctors per unit of population became twofold, midwives six to eight times, and nurses five times.
- Ironically, the quality of health services provided by the government has gone down drastically over the years. Only one-third of the outdoor patients now opt for a public health outlet, as compared with nearly one-half in India. It is a case of management failure. While the popularity of the public sector suffered, the private sector started flourishing. Under the evolved scenario, a new responsibility devolves upon the government. It should make every effort to regulate the private sector in terms of registration, facilities provided, and fees charged.
- The average cost of outdoor treatment per occurrence of illness in the private sector is one-third higher than that in the public sector. The cost of hospitalized treatment is 2.5 times more expensive. The average cost of treatment per occurrence of illness in the public sector is roughly one-third higher in Punjab than at the all-India level.

- The birth rate of Punjab, at 21.5 per thousand in 1999-2000, was three times the death rate at 7.3 per thousand. A continued thrust on family planning is necessary to stabilize the size of the population.
- Some dimensions remain worrisome in the sphere of reproductive and child health: Maternal mortality rate of 369 per lakh women is four times that of Kerala; still-birth rate at 10 per thousand is higher than the national average of eight; about 60 per cent of the deliveries take place at home; and nearly one-fourth of the children born are underweight. No less than 41 per cent of the women suffer from anemia. Punjab's infant mortality rate, at 52, is fortunately lower than India's 68.
- On nutrition, 15 per cent of adults in Punjab have been reported as obese. This percentage is 30 in the case of women, the highest for any state in the country. On the other hand, per capita calorie intake in the state declined by almost one-third during 1972-94, while it remained static in India. Protein intake has come down, but fat intake has risen.

The above discussion confirms that the situation is not happy on the health front in Punjab. The public sector is not delivering the services on the desired lines. There is increasing disenchantment with its performance. The private sector is proving effective, but is expensive for the poor. Preventive and emergency health services remain the domain of the public sector.

Affordability does not seem to be a major issue in the sphere of health care in Punjab. It is the access to and quality of service which is more critical. The public and private sectors need to define their respective roles in that light. A system can be evolved wherein 'the public sector concentrates more on primary health care, health education, sanitation, immunization, emergency services and specialized treatment and the private sector is encouraged and facilitated to take care of curative services'. Equally crucial for the government is to manage the private sector properly through its mandatory registration, service monitoring, and fees regulation.

Infrastructure

As a base and concomitant of the development process, infrastructure is fairly well organized in both rural and urban segments of Punjab. On the score of infrastructure rating, the Centre for Monitoring Indian Economy has placed Punjab on the top; with an index which is almost twice the national average. No less than 94 per cent of the net area sown here is irrigated, 75 per cent by tube wells and 25 per cent by canals. Virtually all the 12,729 villages are not only electrified but also linked by pucca road. The 144 regulated markets, for disposal of agricultural produce, are spaced at an average distance of 20 km from each other, and are attached to 519 sub-yards distributed all around. Over 40 per cent of the 2,575 bank branches in the state are located in villages. As many as 597 rural focal points are being developed to provide a variety of services to rural populace.

In overall terms, per capita consumption of electrical energy, at about one thousand kwh, in Punjab is the highest among all the states. The total consumption in 2000-2001 was 2717 MW; one-half thermal, one-fourth hydel, and the remaining one-fourth purchased from the national grid. Agriculture shared 29 per cent of the total consumption, industry 42 per cent, and domestic and other uses 29 per cent. Eighty seven per cent of the households in the state have electricity connection. Demand for power is growing by seven per cent annually. Transmission and distribution losses are placed at 17 per cent and non-technical losses at another nine per cent. Losses of this nature, hidden in the free supply of electricity to agricultural sector, are

not included in this assessment. Revenue per unit is Rs. 2.07 against the cost of Rs. 2.93, representing a subsidy of over 40 per cent.

Punjab is well served by a dense network of roads: 1.1 km for every one sq km as compared with 0.4 at the national level. Road length, which was only 6,000 kms in 1965-66, had increased to 55,000 kms by 2000-01. Intrastate mobility is primarily by road; the most distant town is within six hours of bus journey from the state capital. High speed trains connect Punjab with all parts of the country. Since intracity mobility by rail is of modest order, it is all the more necessary to strengthen complementarity between rail and road transport in Punjab. Notably the state does have an international airport at Amritsar and a domestic one, at Ludhiana.

About 26,000 public call/straight trunk dialling offices connect Punjab not only within but also nationally and globally. The 13 lakh connections give a telephone/population ratio of 5.5 per thousand persons as compared with 3.6 at the all-India level. Practically every panchayat in the state is connected by telephone.

All this is highly creditable. This quantitative scene is, however, not backed up by a quality culture. Electricity breakdowns are not infrequent; electricity in villages is available only for seven hours in a day; and electricity losses in transmission and distribution are huge. During the nineties, while the number of motor vehicles multiplied two times to almost 30 lakh, the road length got extended by hardly 20 per cent. Several roads require immediate widening, or repairs, or both. By comparison, while the quality of telephone service has vastly improved over the years, its quantitative coverage is far from complete. The waiting list for a phone runs into thousands.

Natural Resource

The natural resource base of Punjab - land, water and vegetation - is under great stress. No less than 85 per cent of the state's geographical area is under cultivation, of which 94 per cent is irrigated. Cropping intensity is as high as 186.

Around 40 per cent of the land is said to be degraded in varying degrees. Included herein are the gully or ravine lands in the northeastern hilly and submontane region; soil-fertility depleted pockets in the central zone; water-logged tracts in the southwestern region; and marshy land along rivers and streams. Nearly 11 lakh tube wells (85% in the rural and 15% in urban areas) regularly suck underground water for irrigation, domestic, industrial and other uses. Nearly one-half of the development blocks (especially in the central zone where water table has gone down by five to ten metres during the last 25 years) report over-exploitation of subsoil water. Hardly three per cent of the total area is under actual forest cover. Such a situation is a sad commentary on what is happening in an agriculturally progressive state, dependent highly on soil and water. Added to all this is the fact that almost 70 per cent of Punjab is prone to floods.

The Government of Punjab is putting in considerable effort to redeem the situation. Watershed development projects have been undertaken in parts of the Kandi or submontane tract; wetlands are being raised on systematic lines in highly flood-prone areas; and water-logging is being tackled in all seriousness in the southwestern region. Depletion of underground water and fall in soil-fertility are worsening in the wheat-rice rotation region, which covers almost one-half of the state's total area. Diversification of the cropping pattern is certainly a remedy; the feasibility of developing tube well and canal irrigation, as complementary to each other in the same area, should also be explored. Flood-proneness of a large part of Punjab is

paradoxical, but understandable, when one realizes that roads and canals at several places have been constructed against the grain of the land and thereby obstruct the natural flow of water. The drains, which are meant to flush out the rain-water, are often poorly maintained, get choked and cause floods. These drains should not only be cleared of any obstructive material on a regular basis, but also be provided with check dams placed across at a reasonable distance from each other. This will help in harvesting the rain-water, and thereby recharging the underground water.

Finally, to compensate for the gross inadequacy of forests in Punjab, agro-forestry and social forestry continue to be a viable proposition. Agro-forestry should be encouraged in flood-prone and water-logged areas; and social forestry on panchayat lands. Government should prefer plantation of sheesham over eucalyptus along roads. Since many saplings, planted by government agencies, get uprooted due to lack of proper care, it is essential to involve the local population in this task. Farmers, whose lands adjoin the plantation sites, may be asked to provide necessary care. Strategies, of course, will vary in accordance with local conditions.

Concluding Remarks

On the whole, Punjab emerges as a grand success story. Despite the constraint, inherent in its location on an international border with an unfriendly country and the challenge posed by militancy during the eighties, it has the highest per capita income in the country, was the first to work out the green revolution, and is now aheading towards a phase of large-scale agro-industrialization. Evolving in the mode of a 'culture of competition', the state is taking time to acquire a 'culture of co-operation', Human development is yet to reach the expected level. For that matter, Punjab has not been in a position as yet to realize its full potential.

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Chapter 15

STRATEGY FOR DEVELOPMENT

After defining the development perspective for the state in the light of issues emanating from its performance in different fields, we may now spell out some viable strategies for the realization of our vision of Punjab. Strategies in respect of various sectors have been spelt out in the previous chapter, while deliberating on the issue of perspective in each case. A restatement of the same is deemed unnecessary. The effort here is to suggest strategies, which seep through the entire system, instead of covering specific sectors.

GOOD GOVERNANCE

A stark reality is that, Punjab, of recent, has not been in a position to sustain the tempo of its development process. Where does the fault lie? One could single out the 'lack of good governance' as the real malefactor. A populist political culture, not-so-efficient bureaucracy, sagging work culture, lack of necessary respect for law, and above all, systemic corruption are among the parameters describing such a situation. The malady may be nationwide but that is no reason why a progressive state like Punjab should have fallen in line. There are, at the same time, examples of Maharashtra, Karnataka and Andhra Pradesh doing much better in governance, at present.

How to remedy the situation? How to reinvent the government? What does good governance involve? In the final analysis, it stands for conduct of the affairs of the state in such a manner that it enhances the creditability of those who are at the helm of affairs at each level; is cost and time-effective in responding to the needs and aspirations of the people; and has civil society as its cherished goal. In addition, it has to promote economy, ensure equity, enhance ecology and provide security.

Three important observations will be in order here. First, the concept of governance is not understood properly in developing countries, where it is equated with the idea of 'control'. This is not the spirit of the term. Governance is a process by which 'a society solves its problems and meets its needs by using government as an instrument' (Osborne and Gaebler 1992, p.24). With government at the core, it encompasses also the role of the private sector, non-government organizations and individual households, and thereby involves people in its functioning in a variety of ways. This contemporary liberal meaning of governance must be made a part of popular understanding. Secondly, the mindset of the personnel in the conduct of governance is also to be transformed. They must not project themselves as providers and benefactors, as they have been doing so far. They have to be in the service of the people and for that they have to take some new lessons. The most important learning would be that 'good governance is driven by some grand mission rather than by rigid rules and regulations. It decentralizes any activity requiring management and pre-empts problems before these arise; and empowers citizens in terms of control over their affairs and treats them as patrons by offering choices between a variety of services'. Finally, the people at large must realize that 'good governance' is their right, rather than a gift from the state.

Access to information is a condition of good governance, as a factor of empowerment of the people. It enables them to be subjects and not mere objects of development. It

is in this context that the IT revolution assumes tremendous significance. It must serve as an instrument of e-governance, among other things.

As such, the role of e-governance requires elaboration. This, of course, begins with networking of each of the administrative centres in the hierarchy. Equally essential is to net every panchayat and nagarpalika in the system of e-governance. No less necessary is it to make available details of development schemes, forms for availing opportunities offered by the government, and all other information of public interest, on special websites designed for the purpose. Widespread training of a large number of personnel in computer-use is a prerequisite for promoting such a culture of governance.

EMPOWERING LOCAL BODIES

How to involve all the stakeholders in the grand task of good governance? The most effective strategy would be to strengthen the local-level elected bodies. This calls for genuine faith in the efficacy of the panchayats (rural) and nagarpalikas (urban), as mandated by the 73th and 74th Constitutional Amendments. Much remains to be done on this count in Punjab. The first necessary step would be to devolve to local bodies all the subjects earmarked for them in the sphere of service provision and development planning and to provide the necessary administrative and technical support for the purpose. Local bodies, in their own turn, should feel obliged to do the following: (i) monitor the quality of services, such as school, dispensary, water supply, electricity and link roads, made available to their locality by the state government; (ii) highlight village problems, such as flooding, water-logging, and plant diseases, so as to draw the attention of those concerned for necessary action; (iii) prepare a blueprint of a development plan of the settlement; and (iv) take care of the natural resource base.

All this is easier said than done. It will not translate into a possibility, let alone be a reality, until the members of the panchayats and nagarpalikas are made aware of their obligations and rights, through well-designed training programmes on a continuing basis. The knowledge, technical skill and governance capacity of the peoples' elected representatives have to be upgraded for ushering in a new era. The task is stupendous, as it has to cover almost one lakh persons of 12,369 gram panchayats, 140 panchayat samitis, and 17 zila parishads in only the rural segment of the state. Thousands of elected members of nagarpalikas are to be taken care of, in addition. The experience of involving of the Centre for Research in Rural and Industrial Development, Chandigarh, in this grand talk demonstrates the effective contribution that non-government organizations can make in this sphere.

MICRO-LEVEL PLANNING

As a concomitant of political decentralization at the grassroots level, a genuine thrust to micro-level planning, with a village/town or a block or a district as the spatial unit, has to be an essential ingredient of any development strategy for Punjab. What is visualized is an integration of plans prepared for individual settlements, blocks and districts, through involvement of all the stakeholders. This is not the practice at present. Planning and development still remain a government activity, by and large. As a result, the masses have acquired a state-dependency mindset, to the exclusion of local enterprise and leadership. A call for adopting a 'genuine' mode of decentralized planning is made here to reverse this tendency, so that a more meaningful socio-economic transformation gets under way through peaceful means.

A micro-level plan is in the nature of a blueprint for action. This bears resemblance to building a house whose design is based on a comprehensive understanding of the site-conditions, prevailing architectural style, financial capacity, and future requirements. This analogy should not be carried too far. A micro-region has an already evolved structure, which is to be remodelled. Micro-level planning, thus, comes closer to restructuring an existing house, with a vision. In actual practice, the job may involve the following tasks: recommending location specific projects for filling spatial gaps in the distribution of infrastructure; suggesting ways to harness the potential and solve the problems of the micro-region; reviewing the ongoing schemes and indicating as to which should be made to continue, or be modified, or even abandoned, or which should be adopted as new; promoting schemes in the nature of self-help groups; and identifying special areas of concern, such as backward villages, village common-lands, and hazard-prone sites. Such an exercise requires a detailed mapping of land use, settlement system, and infrastructure. It also demands an insight into the socio-economic life, political contours, institutional arrangements, aspirations and constraints of the people. It presumes a comprehensive and intimate knowledge and appreciation of local conditions.

Not much effort is visible on this front. The ground experience is that the Additional Deputy Commissioner, expected to take care of the development agenda, is sometimes not given charge of the relevant subject. Such defaults should be taken care of. Similarly, the office of the block development officer, vital at the local level, is subjected to frequent change of incumbent. A sense of continuity in development planning is simply lacking. It is essential to follow the tenets of development administration, to make micro-level planning effective. Matters are likely to improve if a block is administered by an officer hailing from the Indian Administrative Services, under the proposed scheme of having the district and the block as the only two tiers of administrative areas.

ADMINISTRATIVE AREA REFORM

A close scrutiny of the administrative map of Punjab, down from the division to the district, tahsil and block level, reveals certain serious distortions in the organization of the administrative space. Currently, the state is organised into four divisions, 17 districts, 72 subdivisions, and 140 development blocks. In 1966, Punjab had two divisions, 11 districts, 37 subdivisions/tahsils and 117 development blocks. Despite some efforts at rationalization, Ferozpur district remains unwieldy and Kapurthala fragmented. Boundaries of three districts and seven subdivisions were tampered with to create Fatehgarh Sahib district. It covers an area which is not much bigger than an average subdivision in the state. A periodic administrative area reform, not on an ad hoc but on comprehensive basis, emerges as an essential task for the sake of both administrative efficiency and development administration.

There are some other issues to deliberate. Should the state continue with its existing system of divisions, districts, subdivisions or development blocks, or dispense with divisions and subdivisions and retain only districts and development blocks? What is the relevance of a division in a small state like Punjab? Do we need subdivisions when the average number of development blocks in a district is just eight? Multiplicity of tiers in administration generates confusion and creates delays (Krishan and Kant, 1998, p.12).

There is still another moot point for deliberation. Should development blocks continue to remain exclusively rural, as they were originally designed, or should any town/s falling within their territorial jurisdiction be also included as part of the block? The rationale of keeping rural and urban areas separate in any scheme of things is

difficult to justify in the present context. Such a difficulty arises especially when one is preparing a block plan, potential for rural-urban agro-industrial complexes and integrated development. How is this possible if towns are to be kept out of reckoning? This is not the way ground realities operate. A block must cover both villages and towns located within its spatial parameters. Such a reform is long overdue.

As a development strategy, there is still another way of reforming the administrative areas. Let the boundaries of the state assembly constituencies and those of blocks correspond with each other, and likewise the boundaries of parliamentary constituencies should find conformity with those of higher-level administrative units, such as divisions or a group of districts. An arrangement on these lines will render the imperative congruence between political, administrative and developmental dimensions of the state, at all spatial scales.

CIVIL SOCIETY

Punjab must strive at evolving itself as a civil society to accomplish all this, and also as an ultimate goal in itself. The basic strands of such a society include: a genuine faith in pluralism as inherent in every system; a reinvented democracy, sensitive equally to aspirations of the minority as much as of the majority; and the presence of all varieties of civil groups, which function not merely in their own interest, but for a collective cause, by influencing the decision makers. Civil society does not allow the government to be authoritarian, but has no design on its part to be a 'political equivalent of the private sector'. Its aim is to transform differences into complementarities, competition into co-operation, and distance into proximity. Thereby, it ensures identity, dignity and liberty to every individual (Uberoi, 1999, p.104). A 'humane future is envisioned', with the state as a more 'responsive than repressive' agent. Cultivation of appropriate 'cultural values and civic virtues' is basic to the attainment of such a goal.

Punjab, as a society, is marked by a significant degree of structural stratification and spatial segmentation. Structurally, it displays diversity in terms of religion (Sikh, Hindu, Christian, Muslim and others); caste (higher, peasant, artisan, service, and Scheduled ones); and status (landowning or landless and native or immigrants). The urban and rural back-ground, and also the sub-regional identity of the Majha, Doaba and Malwa, on traditional lines, represent the spatial parameters of distinction. This is the context in which the question of civil society in Punjab is to be placed.

Punjab is the only Sikh-majority state of India. With 63 per cent of its population Sikh and 34 per cent Hindu in 1991, the state is essentially bi-religious. A happy feature is that the two communities have a common heritage, shared values, and similar life-practices. A tradition of honouring each other's religion has always existed.

As a fact of history, the Hindus in Punjab were more urban-based, and the Sikhs concentrated predominantly in rural areas; the former more in trade and services and the latter in agriculture. Over time, a kind of complementarity and interdependence between the two took shape on economic lines. With the spread of education and the recent acceleration in the process of urbanization, accompanied by migration from villages to towns, the proportion of Sikhs in urban areas has been enlarging. They have been entering into services, trade, transport, industry and other urban vocations in an increasing number, particularly after the formation of Punjab in 1966. This has brought the two communities on a more interactive common space and mutual interdependence, a situation which can facilitate the formation of a civil society.

Both the Sikh and the Hindu communities have their caste divisions. The primary one is that between the Scheduled Castes and the non-Scheduled ones. It is estimated that among the Scheduled Castes, who now account for around one-third of the state's population, more than one-half are Hindu and nearly one-half Sikh. They have to contend with common issues of economic upliftment and social mobility. The factor of religion gets diluted in their case. The task of working towards a civil society in the state gets simplified, by bringing the two religious groups onto a common space.

A notable feature of the evolving scene of Punjab's demography is the sizeable inflow of migrants, from the Hindi belt, mainly as agricultural and industrial labourers. They are integrated economically with the native society, but to what extent are they socially linked is a moot question. Some chauvinists view this trend as disturbing as it will affect the electoral calculations of those with vested interest. Mercifully, such a feeling is not pervasive; certainly not expected on the part of a community which itself has sought new pastures, not only within the country but also in foreign lands. The intention here is to indicate that we should try to cultivate desired perceptions on this front, in the interest of the civil society that we envision.

Finally, what should be the strategy for the realization of a civil society in Punjab? This objective will be best achieved if non-governmental organizations are encouraged to play a big role, especially in rural areas, by way of organizing people to solve their problems. Such groups tend to be plural in composition and are expected to imbibe values, which are civic in nature. Non-governmental organizations, on their part, have to learn a great deal from the style of missionary institutions. They have to work with all dedication. In other words, while working towards the goal of designing a civil society, they must combine education, health, and human values as part of their activities. Secondly, in recognition of the fact that the Punjab society is highly materialistic and pragmatic, it will be necessary to demonstrate that a civil society is in the economic interest of each of its members. They must feel convinced that such a system is indispensable for protecting and sustaining their relative prosperity. A cost-benefit analysis of conflict resolution on these lines will change their perceptions for the better. Finally, it is not merely education but its quality built through the input of dedicated teachers as a role model, which can facilitate this process. They are the ones who produce the decision makers, administrators, doctors, engineers, and teachers themselves, among others, and influence the overall value system of a society. Civil society must have the 'teacher' at the centre of its all-strategic formulations.

GENDER SENSITIVITY

An issue most critical to the creation of a civil society in Punjab is to render due status to women in the overall scheme of things. Despite its impressive gains in economic development, exposure to the developed world, and spread of education, the society here is not as just to the fair sex as expected. By and large, a girl child remains unwelcome at birth and women face neglect and discrimination in various forms at different stages of their life. In the first post-independence Census of 1951, Punjab's sex ratio, which is an indicator of the very survival rate of the female, was only 854; even after fifty years it improved to only 874 in the 2001 Census. These figures are much below the sex-ratio at birth of around 950 and are a pointer to the higher mortality rate of females. Punjab's total fertility rate, representing the number of children a woman is likely to bear in her life-time, was higher than the national average till 1971. In 1998-99, Punjab's female infant mortality rate, at 65, was distinctly above the male infant mortality rate of 50.

Most worrisome is the recent rising incidence of female foeticide, estimated at around 90,000 a year, in response to the easy accessibility of the pre-birth sound scanning technique. This is manifest in a sharp decline in the sex ratio of 0-6 age group from 875 to 793 during the last intercensal decade of 1991-2001. Urban and rural areas do not differ much in this regard, signifying that the practice of female foeticide is fairly widespread. This uncivil propensity, which is an evil device to marry family planning with son-craze, is unpardonable and poses a challenge to be met with effectively.

On the other hand, the emerging situation is not without some positive pointers. The 73rd and 74th Constitutional Amendments have mandated reservation of at least one-third of the seats in panchayats and nagarpalikas for women. This has certainly changed conditions in their favour, as far as political representation at the local level is concerned. The share of women among government employees in the state has gone up from 14 per cent in 1981 to 17 percent in 2001. Most notably, girls outnumber and outshine boys on the college and university campuses in the state.

Much remains to be done. A basic task is to instill the value of the daughter in the son-crazy psyche of Punjab. One necessary step would be to make liberal education universal, wherein gender sensitivity is convincingly ingrained as a part of learning. On pragmatic lines, the issue of the status of women can be addressed through two strategies: (i) small family, wherein they are not to bear large number of children restricting their mobility, and (ii) economic self-reliance, which gives them a greater leverage in taking life-decisions. As such, promotion of family planning and generation of women-friendly job opportunities emerge as the two basic steps towards the realization of this goal.

SUSTAINABLE SOCIETY

Finally, any development strategy for Punjab has to incorporate the elements of environmental, politico-economic and socio-cultural sustainabilities. Environmental sustainability is assured if the inherent productivity of the ecosystem is not made to suffer any loss; rather it is enriched in terms of its constituents, individually and collectively. This is possible if the life-support system is protected from contamination of water, degradation of land, depletion of soil fertility, removal of vegetation cover, pollution of air, and loss of biodiversity. From the viewpoint of politico-economic sustainability, all such modes of production and political institutions are to be promoted, which lead to a higher level of economic well-being and allow people to participate in decision making relevant to their day-to-day life, mutual interaction, and integration with the wider global context. Socio-cultural sustainability is a function of the freedom which people enjoy in pursuit of happiness, harmony and justice, as also of fulfillment of the life-values they cherish.

Punjab is not in a comfortable situation on the question of multifaceted sustainability. Economic development has extracted a heavy ecological price; functioning of the politico-economic system is riddled with infirmities; and socio-cultural institutions are under the stress of moral collapse. The question of sustainability is rarely raised beyond its economic parameters. Ethical questions are described as lacking pragmatism. Traditional culture is losing its sheen. What to do and where to go? How to transform Punjab into a prosperous, good-governed and civil society state on a sustainable basis? That is the question.

CONCLUDING REMARKS

The discussion in this and the preceding chapter allows us to put together the main strands of the development strategy for Punjab. These include: rejuvenation of the socio-economic dynamism of the state; improvement in the quality of life as well of habitat in both rural and urban areas; upgradation of the human resource base by improving the quality of educational and health services; diversification of the economy from agriculture to non-agriculture, of agriculture toward non-farm activities, and of wheat-rice rotation towards ecologically viable crop-combinations; and effective management of water and soil.

Additional issues pertinent to the development perspective can be listed as: How to make Punjab investment friendly for industry? How the state should be meeting the challenges posed by globalization of the economy, labour-replacing new technologies, and overproductive biotechnology? How to promote a culture of taking rational locational decisions, wherein economics leads politics rather than politics leading economics? An item not to be missed on any agenda of a development perspective for Punjab relates to raising the 'status of women' in society. In the final analysis, 'rejuvenation, quality, and management' emerge as the three key ingredients of reinventing Punjab today.

For years after independence, Punjab effectively demonstrated that it could lead in the mode of a model state in India. Today, it is craving to be led for full the realization of its potential in the making of a prosperous, just and civil society. The tide will turn only when leaders with foresight awaken the state from the slumber of past glory and create a space for new dreams to manifest.

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Chapter 16

CONCLUSION AND POLICY DIRECTION

The idea of preparing a State Development Report (SDR) on Punjab for the period 2002-2007 and, thereafter, developing an overview in the form of Vision 2020, is an innovative initiative taken by the Planning Commission of India. The process of giving expression to this initiative has been educative and rewarding for all those who have participated, as contributors and even beneficiaries, benefactors and stakeholders, with whom we have had occasion to interact.

The above statement needs to be briefly elaborated by informing one and all that the contributors, numbering around 16, comprising the members of the faculty, had to undertake a rigorous exercise to go through the reports of the Planning Commission of India and of the State Planning Board, Punjab. The knowledge and insight acquired from these systematically prepared documents during the long span of 50 years was found very useful. This effort was further supplemented by studying a number of other documents pertaining to the process of both planned and non-planned development that had taken place in Punjab, in the context of national development. The exercise was further enriched by the knowledge, information and experience of the officials and experts working for the Government of Punjab, through intensive, as well as extensive, interactions with them extending over a period of time. This process concluded with the benefit of sharing the views emerging from these diverse interactions, on more than one occasion, with the Chief Minister of Punjab, who spent considerable time to ensure that the state benefits from such an indepth exercise carried out by CRRID. Involvement of the stakeholders, representing agricultural, industrial and service sectors, was perceived as equally important and a number of interactive meetings were organized at different places in Punjab and at Chandigarh.

This document has been specifically designed to be a referral point for those who are concerned with the processes of development in Punjab. Above all, this report was perceived as an attempt to provide a basic source of systematic information and practical analysis of each sector of development for researchers, administrators, beneficiaries, benefactors and stakeholders. It is proposed to continue with this exercise, even after the presentation of the final report to the Planning Commission, by the team of researchers who have contributed to it, by examining as well as analysing a number of researchable issues, which were left out of the scope of the report, partly because of the time constraint. The intention is to go into greater details and disseminate the findings by bringing out major publications on the different issues concerned. There are plans also to organize regional, national and international debate at home and abroad to enlarge the participation of concerned individuals, groups and particularly Non-Resident Indians, as well as institutions engaged in the study of the Indian perspective of development focusing on Punjab. This is how the long-term perspective of developing collaborative research to feed the process of bilateral development between states and societies shall get strengthened, for the benefit of all those striving to enlarge concerns

in the field of humanities and social science research, directed at promoting initiatives towards peace and co-operative development.

The present State Development Report on Punjab reflects several years' experiences and expertise gathered by the interdisciplinary team of researchers of CRRID, who have authored these chapters. They have worked on a number of research studies of a multi-disciplinary nature over a period of time during the last two decades. These studies have a direct bearing on the State Development Report. Some of these are discussed below in support of the above statement.

The research programme at CRRID began with the study of the 'Impact of Plastic Industry on Rural Unemployment in Small Scale Rural and Household Industries'. It received the attention of no less a person than of the stature of Mr B Sivaraman, Member Planning Commission, who wrote an article based on the findings of this study. Further, the Government of India appointed a committee under Mr G V K Rao to examine the issue of the use of plastics in irrigation and agricultural sectors. The other study, which followed the earlier one, was on the 'Impact of Migratory Labour on the Rural Economy of Punjab'. It raised a number of researchable socio-economic, cultural and political issues, which continue to be debated even today. A short while later, a major programme of a multidisciplinary study on 'Communalism, Communal Violence and its Impact on Development and National Integration' was sponsored by the National Integration Council. It had been designed to conduct intensive as well as extensive field work in selected riot-prone and riot-free districts in seven states of India, namely, Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The study evoked the concern of planners, administrators, scholars and public leaders from all walks of life, resulting in the formation of fresh policies by the State and the Central Governments for meeting the virus of communal violence. Unfortunately, like many other nationally important issues, the Government of India and the State Governments did not back up this programme. The same could be said about the Border Area Study undertaken by CRRID to understand the problems and prospects of the border areas of Punjab, Jammu and Kashmir and Rajasthan. The Kargil episode has proved that gathering of intelligence and its failure, resulting in a dialogue of shells, is not a substitute for supporting interdisciplinary research on border areas that brings out the aspirations, expectations, inadequate or slow development, hostility and other causations which find continuing and unabated expression in violence and counter-violence, of which innocent men, women and children are the ultimate victims. Although the study of the border areas, like our earlier studies, was enthusiastically commended and commented upon by the Government of India and others concerned with this programme, support for its continuity was not assured.

Viewed from the context of providing policy inputs, as part of the conclusion of the State Development Report, it is important to record here the need to strengthen the Panchayati Raj Institutions, set up under the 73rd Amendment to the Indian Constitution, and institutions of local self government under the 74th Amendment. The importance as well as relevance of these institutions has been cited by Dr James D Wolfensohn, President, The World Bank, in his Foreword to *Entering the 21st Century: World Development Report, 1999/2000*, as under :

Localization is praised for raising levels of participation and involvement, and providing people with a greater ability to shape the context of their own lives. By leading to decentralized government where more decisions happen at subnational levels, closer to the voters, localization can result in more responsive and efficient local governance. National governments may use a strategy of decentralization to defuse civil strife or even civil war. However, when poorly designed, decentralization can result in overburdened local governments without the resources or the capacity to fulfil their basic responsibilities of providing local infrastructure and services. It can also threaten macroeconomic stability, if local governments, borrowing heavily and spending unwisely, need to be bailed out by the national government.

The step that needs to be taken by the government, without losing time and which is going to contribute substantially to development, is the diversification of agriculture. This is of paramount importance to Punjab. It is and shall continue to remain an agrarian state, with the development of small-scale industries as its backbone for its future progress. Improvement of the quality of rural life is achievable through the development of rural areas. It is deeply linked with the future growth, development and diversification of agriculture and small-scale industries. While agriculture needs diversification, small-scale industries need upgradation, both in terms of manpower and machinery, to capture the quality-conscious market at home and abroad. The other areas of priority are human resource development and information technology. The observations, recommendations, suggestions and findings of the authors of the report, based on both primary and secondary data, are comprehensive enough and does not bear repetition.

Another major area that needs a clear policy direction relates to generation of employment. The scope for this lies in developing co-operatives in the rural areas and decentralized training and manufacturing activities by upgrading the skills of available manpower. The most important untapped area for generating employment on the one hand, and ensuring success of the third tier of democracy on the other, is achievable by using the existing strength of teachers, after imparting in-service training to them, to train, in turn, the elected representatives of Panchayati Raj Institutions and local self-governments. Such training is already being imparted, though in a limited way and at a higher cost, to enable the elected representatives prepare their micro-plans and ensure their implementation on the subjects transferred to them. The experience of the CRRID team, engaged for the past several years in research on the functioning of Panchayati Raj Institutions and the local self-governments and in the education and training of their elected representatives, has established the need to take a policy decision in this vital area of development, which will not involve any heavy financial burden on the state. Instead, this will be a major means of improving governance, employment creation, revenue generation and human resource development.

As already pointed out, practically all the chapters have provided conclusions and policy directions. It may, therefore, be appropriate not to lengthen the statement by avoiding unnecessary repetition.

Nevertheless, there are a few areas of priorities, which need to be looked into by the government. There is the urgent need to prepare a district plan for urban development, by involving elected representatives of local self-governments, officials, members of the legislative assembly and of parliament, and experts. Equally important is the preparation

of a similar plan for the Zila Parishad covering the rural population. Such participation in the planning process at different levels of the political system would go a long way towards the preparation of a well-conceived document for the government for pursuing its priorities and development. Further, it would also provide information and access to experience, to help generate the financial, human and infrastructural resources which are the constraints faced by the Government of Punjab.

It is in this context that the team of contributors and experts, which has prepared the State Development Report, has taken pains to identify untapped areas for raising these essential resources. This vital component of development has become a major challenge, when the market is going to be the decisive economic factor of progress. At the same time, the IT revolution provides access to requisite information and knowledge to strengthen human resources as the ultimate instrument of development. One can only hope that the State Development Report will contribute positively towards building a new Punjab equipped to face the challenges of new times.

In conclusion, it may be stated that Punjab has to develop a model of its own, based on its limited natural resources, abundant human resources, wide base of agriculture and small-scale industries and with many opportunities available in the field of Information Technology. All the potential that exists can be realized with the help of clear policy directions, which are required to be given to tap these resources. The greatest resource of Punjab is the native genius, skill and work culture of its people. Once this is mobilized, the sky is the limit.

Chapter 17

VISION OF PUNJAB 2020 – PRESENT, FUTURE AND THE PAST

Dr K Venkatasubramanian, Member, Planning Commission and Chairman of the project, State Development Report (SDR), from the very beginning has been persistently putting forward the idea of the projection of 'Vision 2020' as part of the report on Punjab. He has also personally expressed the view that the Centre for Research in Rural and Industrial Development (CRRID) as an Institution, and I in my individual capacity, must ensure that the report has a distinct character very different from many others he might have come across. Actually, the chapters in the SDR for Punjab and also my own contribution do present a kind of long-term perspective reflecting the perceptive views of the scholars at CRRID, who have been responsible for this report. A 'Vision', however, is a different matter. It is the domain of a highly sensitive, discerning, far-sighted and intellectually superior mind. It is no modesty on my part to say that I do not match up to this challenge of discerning the future of Punjab, particularly in the context of the senseless violence, that this state has gone through in the not too distant past and the environment of uncertainties prevailing in the world today, caught in the process of unprecedented change.

The SDR has systematically dealt with each issue and area that requires priority in accelerating the process of development and social transformation of Punjab, in these challenging times. Such a perception is being considered within the framework of the opportunities released as a result of the enactment of the 73rd and 74th Amendments to the Indian Constitution. This has opened up the possibility of setting the masses of this country in motion, as they participate in the development process through their elected representatives from the grassroots upwards. This brings into play the folk wisdom, which is the heritage of our ancient civilization and the source of our enduring strength.

This is particularly true of Punjab, which has always been a border territory. Through this land have come into our country people from other lands, other civilizations. They have brought with them different customs and traditions. The sturdy Punjabi peasant, as he defended his land, absorbed the best that was in the new culture into his own. This gave him a vitality that has helped him emerge as a major contributor to the process of nation-building, based on plurality and humanism. This found its finest expression in the fusion of 'Sufism' and the traditional culture of the country, creating over a period of few centuries, new spiritual concepts of the Bhakti movement on the one hand and Sikhism on the other. It is this universality of perceptions that has given a distinctive character to the people of Punjab, irrespective of their religious persuasions. It is this rich tradition that has made this part of India a laboratory of the process of economic, social and cultural transformation, through the participation of the people in building their own destiny.

The people of Punjab have proved their courage and resilience by restructuring democracy and strengthening democratic institutions from out of the chaos and anarchy of a decade of political violence and instability. This has once again proved the enduring strength of the spiritual and cultural heritage of Punjab, which is not only the pride of its people, but also of the people of India. It is the collective experience of these people, the knowledge they have acquired over centuries and their imagination and innovativeness, which can conjure up the 'Vision of Punjab 2020'. What follows is a summary of the

'Vision of Punjab – 2020', as conceived by my colleagues. It constitutes the essence of their perception, born in the process of their preparation of this report.

Development of strong inter-relationships and interdependence of Punjab with the neighbouring states of Haryana, Himachal Pradesh and Jammu and Kashmir will ensure sustainability and conservation of natural resources of all the states, viz., land, water and bio-diversity. Scientific afforestation, forest management and efficient use of water resources of the neighbouring hill states will benefit not only these states but also Punjab and other states in terms of additional hydro-power, reduced floods, drought and soil erosion, recharge of depleting underground water table and stabilization of the climate. Strong inter-state linkages will ensure effective conservation of natural resources and mutual and long-term benefit for the people of the region. As a consequence, the nation has a whole would proper.

Looking towards 2020 one sees the landscape of Punjab dotted with high yielding, remunerative, market-oriented crops, supported by technologies that ensure efficient use of inputs, land and water resources for optimum production per unit area. Modern cultivation procedures will be in position with the use of aqua-culture, poly-houses, drip and sprinkler irrigation, bio-fertilizers and bio-pesticides, vermiculture, bio-technology, etc., which are cost effective and help increase quality production.

The corporate sector will be involved in farm services, marketing, establishing of processing and value addition units and developing direct forward-backward linkages between the cultivators and the factory. Strong pro-active agri-research and extension programmes will be attuned to present and future requirements, coupled with government policies in favour of farmers, farming and agro-industry.

Based on experiences and concerns perceived from primary as well as secondary information, the vision for rural development must be viewed as an integral part of the development process. It will be reflected in a positive change in rural areas, both in a quantitative and a qualitative sense. There will be diversified agriculture with value addition, cent per cent literacy, universal access to health services, higher skills for employment for all, the widest dissemination of knowledge through Information Technology, closer rural-urban standards in social, economic, human and physical infrastructure, a rural society sensitive to gender equality, cent per cent coverage and access to safe drinking water, easy access to micro-finances for underprivileged sections of the society, transfer of funds, functions and functionaries to PRIs, empowerment of Panchayati Raj Institutions for good governance, and the environment will be protected.

In the sphere of the development of industries, Punjab will focus on value-added agro-food processing, light engineering, hosiery and knowledge-based industries, such as bio-technology, pharmaceutical and electronics, attain a position of leadership and excellence in producing quality products and emerge as a major exporter by 2020, The SSI sector will be helped to bridge the technological and management gaps with the advanced world. It will acquire the culture of continuing innovation, upgradation and modernization and achieve a competitive edge in the global market and thus accelerate growth and promote employment and exports. An industrial Infrastructure of international standards will be created by setting up industrial clusters, parks and zones with the state-of-the-art technology. Government will only be an effective facilitator and enabler in all these activities.

Punjab's future is urban. By 2020, Punjab will have about 45 per cent urban population or even more. Well managed 'urbanization' will facilitate and sustain economic growth, improve service delivery and develop environmental infrastructure to improve quality of life. The 'urban development strategy' will promote good governance, provide 100% coverage of basic civic services and adequate housing to the shelterless urban poor, reduce urban poverty and ensure efficient management of municipal assets and development of municipal lands for income generation.

In addition, there will be protection of urban environment, involving the private sector for low cost and efficient delivery of services, offloading functional and fiscal responsibilities; and people's participation in urban affairs and a change of current policies and practices, including legal and administrative reforms. The vision is of a sustainable development of urban areas of Punjab by 2020 or even earlier. In the short term, there will be full coverage of the population with infrastructure and services, and in the long term, a qualitative improvement of urban basic civic services, environment and governance.

Poverty will be substantially reduced to make cities productive. ULBs will create poverty alleviation funds to provide employment, security and opportunity - goals envisaged in the *World Development Report 2000-01* - to create 'cities without slums' and protect urban environment in the long run. The people will be active participants in municipal affairs and thus ensure the sustainability of cities. They will be involved in the preparation of the development plans to meet the challenges and the growing needs of urban population.

People are at center of any vision. In this context, the demographic status is not an independent entity and inseparable from the past. In one spectrum, it flows from the current demographic reality in the state, while at the other it is inseparably linked to the overall standards of living and facets of welfare. Agricultural growth, industrial development, urbanization pattern, educational attainment, health status, infrastructure position, rural development and provision of basic amenities in the country in general, and in the state and its surroundings in particular, are key factors that shape the vision of the demographics-dynamics of Punjab. While approaches may vary, the vision of demography for any region depends on securing integration of opportunities, achieving convergence of interests, respecting critical social and cultural diversities, removing economic barriers of poverty and disparity, appropriating technology and building capacity in the society.

From the perspective of population, the vision for Punjab-2020 is woven around a demographic regime that encompasses achievement of replacement level of fertility, control of under-five mortality particularly excess infant deaths, making population less masculine in its composition, reduction of maternal mortality, meeting the unmet need of contraception, promotion of participation of men in family planning, encouragement of responsible parenthood, raising the levels of institutional births, creation of avenues for healthy and productive ageing, dovetailing the Scheduled Caste population profile into wider demographic contours, mainstreaming the in-migrants and stemming the zest for international outflow, removal of gender disparity, etc. However, achieving these demographic goals will not be easy, given the way the Punjabi society is undergoing rapid sectoral transformations. New circumstances are likely to pose fresh challenges. Population reduction and decline in average family size may exacerbate some of the distortions already visible in the society, and may worsen the deep-rooted son-

preference of Punjabi society. Narrowing down gender differences is an extremely complicated mission, as gender disparity is going to be very persistent in future, in spite of rise in education, urbanization and prosperity levels. Hence, the vision looks forward to a strong political will to bring about and devise new methods to usher in community participation at all levels.

Punjab is likely to face newer morbidity patterns emerging because of rising population, in-migration, urbanization and industrialization. The vision of Punjab, for us, goes a step further than the Government of India's goal of 'Health for All'. A distinct vision of health aspires for a generally healthy population, free from the impact of communicable and non-communicable diseases, with client-friendly services at health and family welfare centres. Besides the continuation of the usual preventive health care measures, the state will ensure provisions for the availability of quality health care services (including secondary and tertiary health care services) to everyone, including the underprivileged. The health care system of the future will be more scientific and technologically advanced, with a computerized health management information system in position.

Education in Punjab will encourage the child to grow into an independent, self-confident, enterprising human being, ready to cope with the socio-economic and cultural transformations being brought about by advancements in science, technology and the process of globalisation. Education will be child-centred, focusing on the total development of the child's personality, i.e., expanding the mental agility, physical dexterity and ethical integrity. Education will be joyful, relevant, creative, inventive, enterprising and satisfying learning activity, which inculcates a coherent and a viable value-system based on a scientific, democratic and moral approach to life. This will ultimately lead to a society, which is harmonious, value-oriented, secular, non-dogmatic and economically productive.

Higher education will see opportunities for left-out youths (17-23). Information Technology will be part of graduate and post-graduate level courses. Higher education will be practical, relevant to self-employment, jobs- and market-oriented. Degrees will be linked with industry and market needs. The rural higher educational institutional base will be able to respond to rural development.

The problems of unemployment and underemployment in the state are cause of concern. They might have serious implications for the future if not properly taken care of. In the circumstances the vision-2020 in the area is a Punjab with employment opportunities to accommodate the surplus labourforce adequately. The serious challenge of liberalization, with higher use of capital-intensive technology, will have been met with the growth of employment commensurate with the growth of the economy itself creating higher employment opportunities in the long run. There will be sufficient employment opportunities to achieve near full employment with about eight per cent growth rate of the economy per annum consistently. Levels of investment and savings rates in the economy will be high. Financial, human and material resources will be efficiently used, and in the process augment themselves. There will be accountability and exemplary punishment for any lapses in this respect. Grassroots organizations will be increasingly involved and the people will participate at the local level in decision-making for rational use of resources.

Every worker, whether in the organized, or the unorganized sector, will be provided with the bare minimum basic needs of Roti, Kapra and Makan, health and education.

Necessary conditions will have been created to end child labour. Labour in the unorganized sectors, especially in agriculture, will be covered by social security. Strikes and lockouts will be reduced to the minimum, despite every worker being a member of the trade union, one in each factory. Its aim will be to raise the level of productivity, production, while looking after the welfare of the workers. Collective bargaining and conciliation will be the main methods for the resolution of conflicts between the employer and employees. An environment of mutual understanding and harmony between the employer and employees will prevail. Punjab in 2020 will be a model state for industrial relations.

Vision 2020 for Punjab demands the achievement of a Knowledge Based Society through extensive use of Information technology. It will be fully developed and bring structural changes in the fabric of the society. A super-highway infrastructure up to the village level will be in place by 2020, for an integrated and holistic development for the masses at large. Quality human resource will be available for a knowledge-based society and knowledge-based industry. Information Technology industry in Punjab will have a significant share of the total IT industry of India, through world class IT city-centres and STPs. Collaborative efforts of the industry, government and the academia will ensure rapid growth and their continuous innovation and change is important to remain competitive in the global environment. Government efforts will go far beyond the mere computerization of the government sector and introduce linkages for improving delivery channels, information flows and processes, accessibility and quality of interaction with citizens, business and the third tier of democracy.

The ultimate vision of Punjab in 2020 is of an integrated, peaceful society, well set on the path of once again leading the nation towards new levels of quality of life of its people. A state which interacts creatively and productively with its neighbours and works with the rest of the people of the country as a whole, to build a new India which can face the world with economic strength, political stability, self confidence and pride. Punjab of the dreams of its people is an integral part of their dreams for India.

Striking a personal note, my vision of the future of my land is rooted in my experiences, as history was made on this soil. It began when I was only 11 and had to leave a well-provided for comfortable life. Then followed uncertain days, months, even years of distress caused by the partition of India.

The images of bombing, burning of houses, rape, looting, and mass murders, in the wake of a fratricidal war of brother killing brother, have been seared into my mind. These horrifying images were brought to agonizing life in my mind by the heart-rending repetition of the same barbarism in the name of religion in Gujarat, after more than five decades of building a polity, in which people of all religions are equal.

My vision is born of the experience of the sectarian militancy of religion-based nationalism that rocked Punjab in the mid-eighties, with senseless violence. Like the situation in Jammu and Kashmir today, which is equally painful for me, the experience of Punjab too was a continuing backlash of problems created and left unresolved by our foreign rulers. Similar, in a sense, is the trifurcation of Punjab in 1966 into three separate states and union territory, which has left unresolved the issues which led to this reorganization.

My 'Vision of Punjab 2020' transcends national boundaries. We live in an integrated world. Today, humanity is our concern, whether buildings interconnections across national boundaries or new political, economic, cultural and social structures at the grass-roots at home. There can be no vision, which is not inspired by societal concerns.

My 'Vision of Punjab 2020' is a socio-political and economic transition for social transformation, based on a common national will, and hence without violence. Economic development measured in statistical numbers cannot constitute a vision. It has to translate into the restoration to the people their cultural roots, from which they have been uprooted by the complex process of development, usually imposed from the top. Our strength has been and continues to be the unifying character of our village culture. The technological revolution, while opening up opportunities of a wider interaction with diverse cultures of the world, cannot transcend the roots of our very being. The reality of the global village has to be seen from this small point on the world map.

This demands a shift of focus from mere gathering of information to acquisition of knowledge and its dissemination on a massive scale, never possible before. This is the process to bridge the gulf between the nation and the state that has developed over the years. This is of vital importance for Punjab today, in search of its own destiny in a new world of mind-boggling change. In such a situation the present must draw its strength from the past to build the future. Then alone can be ensured a balanced overall development of Punjab, contributing to the emergence of a society at peace with itself and carrying forward the rich tradition of a plural, integrated, secular, democratic society, which, to my way of thinking, constitute the 'Vision of Punjab 2020'.

Laughing children glowing with health, happy mothers, fields rippling with golden corn, wires surging with energy strung across towers of steel stabbing into the blue sky, the music of wheels of industry, the rhythm of human labour creating plenty, a festival of the triumph of human endeavour. Such is my 'Vision 2020' of Punjab.



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