NOTES ON OUR DEVELOPMENT EXPERIENCE SINCE INDEPENDENCE 1950 - 1985

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Our Development Experience
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The views and opinions expressed are those of the author and do not necessarily reflect the views of the State Planning Board or the Government on the subject.

C O N T E N T S

PREFACE

During the last three decades and a half, India's population doubled itself from 361 millions in 1951 to 684 millions in 1981 and it is in this context we have to evaluate our success and failures. The real N.D.P. increased at an annual rate of 3.5 per cent and per capita income at the rate of 1.4 per cent. The increase has been neither smooth nor as planned by the authorities. Three times in thirty years the total income and ten times out of thirty years, the per capita incomes have shown decline over their previous year's respective figures. In recent years, the amplitudes for annual growth rate fluctuations seem to be widening for the entire period 1950-1985; the annual growth rate for the primary sector is the lowest among the sectors and for each successive decade, they have shown a decline. The annual growth rate for the secondary sector is only 4.6 per cent for the entire period which is a matter for serious concern.

2. Net product gets distributed to different factors of production in terms of compensation as wages and slaries, interest, rent, profits and dividends as well as the income of the self-employed. It is seen that the share of profits and dividend incomes for the public sector is much lower than for the private sector and has shown some deterioration over the years. Also during this period, expenditure on food at constant price has shown only a decline from 67.6 per cent in 1950-51 to 56.5 per cent in 1979-80 which shows that there is still a long way to reduce this percentage to one-third of the total consumption expenditure - a level which is achieved by all prosperous countries.

3. Since 1950, our national output has increased 2.8 times and industrial output four times. We are producing three times more coal, five times more pig iron and steel, six times more cement, a hundred times more fertilisers and twenty times more electricity. The enrolment in Universities and institutes of technology has gone up by 25 times with the third largest stock of scientists and technicians after U.S.A. and the Soviet Union. This is, of course, a tremendous achievement compared to what we could do in centuries of colonial rule. But india's size and importance in the world comity of nations compel us to look beyond our national frontiers and see how our country has fared in regard to our position in the world economy. An indepth study of published comparative achievements of different countries based on U.N. data has thrown up many eye-openers for thought and action.

4. Since 1950, the real volume of gross domestic product has only increased by 3.5 per cent per year in India while the world economy grew at 4.1 per cent. During the same period the real gross domestic product in the Third World has gone up by 4.9 per cent per year. Industrial output in India has incresed at an annual growth rate of 4.1 per cent whereas the output in the Third World increased at annual rate of 6.3 per cent. India's real exports increased at the rate of 1.4 per cent per year whereas the Third World registered an annual rate of growth of 4.4 per cent. Almost every country seems to have expanded its foreign trade faster than India. India had accounted for nearly 2 per cent of the world trade in 1950 which

came down to 0.5 per cent in 1980. India had accounted for 1.2 per cent of the world industrial product in 1950 and was then the tenth industrial country in the world. India now accounts for only 0.5 per cent of the world industrial output and no more than 3 per cent of the industrial output of the Third World. Thus India has gone down the ladder to the 27th place in 1980. If industrial output were to be measured on a per capita basis, India is below the 100th place - 35 developed countries and 65 developing countries have a higher per capita industrial output than India. Productivity per person in India is lower than 1/15 of that in western countries and less than 1/2 of that in developing countries. If the above trends are allowed to continue, it will lead to an eclipse of India in the comity of industrialised nations. If one could make a comparison with our big neighbour China, India had a comfortable lead over her neighbour in 1950; in the last 35 years, India's lead has disappeared in most items. China produced eleven times more crude oil, 6 times more primary energy, 6 times more coal, five times more fertiliser, five times more cement, 4 times more steel and pig iron than India in 1980. It is also necessary for us to remember that China is planning to quadruple its 1980 level of output by 2000 A.D. It is a moot question, therefore, for our political, scientific and technological leadership to ponder over and find adequate answers: Why has not India moved faster in spite of its impressively advanced skill profile and resource endowments? Does not our continuing regression in the world economy lead to a diminishing role for India in world affairs? Is the existing social system - fragmented and fissured by casteism and communalism - conducive to national integration and emergence of modern development values and ethics?

5. The policy perspective recently put out by the Government of India on education is an indictment of the present educational system, the approach of the planners and the policy makers in the past and of the people involved in its working. If the goal of universalisation of primary education still remains a difficult dream, the higher education scene too has been marked by low standards, irrelevant content, politicisation and inefficiency. The absolute number of illiterates has risen since the time of independence from 300 millions to 437 millions in 1981. Of those who enter the school, a substantial number do not acquire the capacity to understand their physical, cultural or socio-economic environment or to think for themselves. Similar is the situation in health and health care, nutrition, sanitation, water supply and housing.

6. What stands out for administrative leadership to ponder over is what exactly had acted as a drag on all our previous attempts to change and reform. Well intentioned moves often ran into severe resource constraints and bureaucratic intransigence or encountered resistance from vested interests in the system who used sophisticated arguments to halt modernisation and change. The emerging political situation in India has some long term perspectives which are not very healthy. The fragmentation of political parties, the growth of organised caste and communal groups and the consequent disenchantment it has created among the people are all factors which we cannot but view with concern. The mass organisations, like the trade unions and the peasant movements are themselves becoming more and more fragmented. The literary and art movements get dis-oriented with current political processes with the result that the intellectual elite groups in our society are becoming more and

more reluctant to associate themselves with the present political processes. As you will appreciate, this is a dangerous trend which can produce disastrous results on the quality of leadership at different levels of management.

7. These notes are meant only for limited circulation to administrative and scientific personnel engaged in the process of plan formulation. In the preparation of these notes, I have received immense help and assistance from all Chiefs of Divisions of the State Planning Board. I am particularly obliged to Shri.N.Thrivikraman Nair, Deputy Director, for his computational assistance. Special thanks are due to Shri T.N.Bhaskaran, Confidential Assistant who took over on himself the entire burden of getting the matter ready for the press. I also thank Smt.G.Kamalamma, P.A. to Member for the heavy work involved which she did most ungrudgingly. I also thank Shri M.Prabhakaran Nair, our Plan Publicity Officer for the effort he put in to get the publication out in record time.

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P.K. GOPALAKRISHNAN

CHAPTER I

TOWARDS A SOCIALIST PATH OF DEVELOPMENT

India under the dynamic leadership of Pandit Jawaharlal Nehru had pledged herself to build an economic and political system which will ensure everyone the basic minimum needs of food, shelter, health care, education and employment in a free and equal society.Pandit Nehru was richly endowed with a high sense of history. He was aware that freedom and equality, as absolute concepts, are in conflict and, therefore, where one is sought to be expanded, the other registers a certain degree of contraction. In the evolution of socialist ideas in India, Nehru's contribution was his choice of path to socialism where essential humanist values of Indian culture are preserved. He believed in creating a society largely based on political and economic decentralisation in which citizens will have the freedom and initiative to shape their economic life. He was opposed to any economic system which allows individuals or groups or the State unlimited freedom to exploit others. The ideology which he owned and tried to put into practice was fully committed to strive for the uplift of the under-previleged and the weaker sections of the population and therefore stands for the widest possible dispersal of the ownership of property and means of production which would ensure social justice and democracy. Nehru was opposed to all concentrations of economic power. He initiated a whole package of measures to curb the growth of monopolists by imposing ceilings both on existing assets and future acquisitions and through differential taxation in income and wealth. The aim of his economic policy was to increase production and to provide maximum productivity and employment. As a student of Socialist thought in the West, the Great October Revolution and the rich Soviet experiment of constructing "socialism in one country" it, *ipso facto* resulted in the acceptance of economic planning for total economic and social change

in the country. Planning has thus become an inseparable part of our national life and this we owe to Pandit Nehru in more senses than one. One of the remarkable developments since independence has been the total acceptance, by virtually every shade of political and intellectual opinion in the country, of the real need for a centrally planned economy for India.

1.2 The above goals of planning and development were conceived in the context of the initial conditions limiting economic development of contemporary India which significantly differ in a number of respects from those experienced by the developed countries. Since the initial conditions India faces today differ drastically from those faced by the developed countries in the past, it is imperative that we must identify our own specific pattern of development strategies suited to our initial conditions and cultural heritage. Pandit Nehru was thus seriously concerned with the material conditions as they really existed in the socio-political milieu in which they operated freely. The time and the growth opportunities India missed during centuries of our colonial past when other countries shaped their agricultural and industrial growth through modernisation and application of science and technology, set a serious limitation on our choice of a growth model.

1.3 Before 1954, Soviet Union was the only country which had accumulated quite an experience of planning for development. With independence, India entered this select band of planners with its comprehensive process of Plan-making, using models. Concepts such as Inter-industry Analysis, Linear Programming, Investment Criteria, Technological choice etc. became more and more adopted in the planning process developed by Prof.Mahalanobis and his team, who made epoch-making contributions to development economics in India. Economy wide planning using these techniques over such a wide

country and immense problems was a unique experience. The concept of maximising some social welfare function became the central idea of our planning in a mixed economy replacing the cardinal role of the individual profit maximisation in a free market economy more under Soviet influence than under the impact of the Western expertise. The model developed by Prof.Mahalanobis was a most elegant and strategic approach to planning which has left a deep imprint on the actual process of development in India. The strategy represented by the model is a clear and direct "heavy-industries-first" model which was meant to help the decision maker in making choices from among alternative development policies.Mahalanobis benefited from consultations with Prof.Strumilin and other Soviet experts of planning. In this process he was ably assisted by Prof.Charles Bettleheim in adapting to Indian conditions the concepts of material balances and problems of technological choice.

1.4 Prof.Ragnar Frisch introduced the idea of inequalities rather than equalities into the mathematical models of commodity balancing. This initial work and lead later led to the construction of an input-output table which was a pioneering contribution of its kind at that time. It was also recognized that there is need to make projections of demand for consumer goods as a function of projected increase of national income as well as desired changes in the inequality of distribution. Engel Curves were fitted, elasticities estimated and concentration ratios calculated for a variety of consumer goods. The role played by the Indian Statistical Institute and Prof.Mahalanobis in initiating and solving theoretical problems of plan modelling in India is unparalleled elsewhere. This brief survey is only intended to bring into focus the search for excellence that Pandit Jawaharlal Nehru practised with his uninhibited search for talents in every country of the world without distinctions

of national, ideological or race barriers. The autonomy and freedom of action that he initiated helped Prof.Mahalanobis to bring under one single umbrella of the Indian Statistical Institute a whole galaxy of talents of both the East and West which was in itself a novel political and scientific experience.

1.5 Unlike Soviet Union, G.D.R. or China, the Government of India can enforce decisions by command only in a small part of the economy. There are in this country not one decision maker but some millions of them. Not only agriculture, small industries, services, commerce and a large part of transportation lie beyond the range of command of the Governmental authority. The result is that the command is independent of ideologies, institutions and authority structures and it is pure fantasy to assume in our context an omnipotent decision-maker which in the last analysis left a damaging influence on the planning process in the country. This lack of sufficient powers enjoyed by the planning authority in matters of production and investment decisions explain the fact that many of our models proved to be failures. One example is the unpredicted profits to ownership classes which in turn attracted private investments to most profitable of such ventures. This gave rise to investment allocations and capacity utilisations being quite different from plan targets. The same has been the story with respect to technological choices. Technologies were imported and embodied in new installations as functions of prices and profit calculations in total disregard of the technical coefficients made use of by the builders of plan models.

1.6 It was believed that socialism could be built up directly through an evergrowing public sector which would render in due course the private sector insignificant. The instrument of planning efficiently used would "enable the public sector to grow so big and important that we may afford

to leave the private sector alone to vegetate the ultimately die out. We will simply squeeze them out". It was also assumed that vested interestsin agriculture will be slowly disarmed, cornered and finally abolished by the socialist process growing on the foundations of the heavy industries which would represent the commanding heights of the economy

1.7 A major initial condition which constituted the most serious limiting factor was the lack of basic investment in agricultural land such as flood control, irrigation and drainage. The second limiting initial condition was the existing surplus of labour combined with a high rate of population increase. Thirdly, the net resource flow between the two sectors was an inflow into the farm sector as against the commonly held proposition that the early phases of industrialisation must finance the development costs largely from a net resource outflow from agricultural sector. These special features combined with the tremendous speed of technological process and the changing structure of world trade made it imperative for a country like India to choose a more complicated and dualistic process of growth than any other models of the past. The choice of technique and organisation therefore had to be made in a much more selective and articulate way.

1.8 It was the above considerations that prompted India to design the development strategy which is popularly known as the Mahalanobis' model. This model sought to satisfy the following essential conditions of growth and development (i) the creation and sustained expansion of the modern economic sector which uses skills and equipment embodying modern technology and science, (ii) operation of modern enterprises and institutions organised on the efficiency principle, (iii) management capabilities of creating a high rate of output over the amount of resources used in production, (iv) the manufacturing of technical and scientific equipment

with the above properties in an increasing ratio determined by the growth process and (v) institutional and ideological conditions which condemn the existing subsistence level of wages and the concentration of wealth in the hands of a few on account of the present emphasis on egalitarianism and social justice.

1.9 It was also envisaged that our specific path of development will be a dualistic process in which the modern industrial sector will continue to grow fast while maintaining, in the early stages of growth, mutually complementary relations with the traditional industrial sector. In the circumstances, it was recognised that the modern industrial sector will have to resort to borrowing of modern technologies, managerial and organisational skills from the developed industrial societies of the capitalist and communist countries of the West and the East.

1.10 The nature of post-war technological progress tends to require much higher capital goods intensities and, therefore, a tendency is noticed to shift the industrial structure towards a more capital goods oriented one which usually requires more capital per unit of output. There are also efforts aiming at import "substitution" which requires industrialisation not only in the field of consumer goods but also in the spheres of intermediate and capital goods. Export promotion may not, in the initial phases of this strategy, catch up proportionately with import requirements, and, therefore, the foreign currency deficit is very likely to be worsened during this transitional period. In the emerging world trade structure, the financing of the imports required for our economic development by the export of primary commodities and manufactured consumer goods is becoming increasingly difficult because of the factors related to technical knowledge, capital and the size of the market. In many branches of the manufacturing industry, the ratios of fixed capital both to output and labour are larger and that has made the optimum size of the plant

in these branches of manufacturing industries enormously large. On the other hand, the initial condition under which we find ourselves today in respect of per capita income, and the institutional infrastructure, make the task of capital mobilisation very difficult. In such a situation where capital and technical knowledge are scarce and the employment problem is acute, it is important to realise that the establishment of the most up-to-date factories in selected industrial branches alone would not solve the real problems implicit in growth. What is called for in such a situation is careful allocation of scarce resources between different branches of industry and between large organised factories and cottage industries.

1.11 We have just completed thirty-three years of planned development and we are now on the threshold of the Seventh Five Year Plan. It is the time to reflect and evaluate our performance during this period. The manifold increase of output of wheat and crude oil are the two conspicuous success in the post-independence period. The output of foodgrains has nearly trebled. India now ranks as one of the major industrial nations - in the magnitude of its output diversification, import substitution and in the production of capital and intermediate goods. There was also tremendous increase in the scientific and technical personnel, enrolment of students at all levels, medical and allied personnel, and a wide variety of social services. There was significant increase in transport facilities of all kinds including railways, shipping, air, road and other communication facilities like post offices, telegraph and telephone services. India has also a honourable place in the realm of research and development notably in nuclear and space research (Nuclear Research Stations at Trombay, Kalpakkam etc. and nuclear explosion capabilities as evidenced at Pokharan in Rajastan, the successful launch of Aryabatta and Bhaskara through indigeneous rocket launching facilities and technology developed at Thumba, Sriharikota and Bangalore).

National income in real terms has recorded a growth rate of 3.5 per cent per annum and income from industries has grown 5.5 per cent per annum. Per capita income has increased at about 1 per cent per annum and the expectation life has increased nearly 70 per cent to reach 51 years for males and 50 years for females.

1.12 Our development strategy regards deliberate changes in the distribution of real income to make it more equitable as the principal instrument of democratic socialist planning. The intention is to assure a minimum real income and to reduce the maximum progressively so that the gap between the two is reduced to a ratio of 1.5. Desired consequential changes shall be brought about in the structure of production. Commodities are to be designed and produced to meet the consumer demand as per the pre-determined market for the same. In this process the private interprise and initiative will be allowed to play a substantial role of supplementing the public sector interprises and public investment and thus channelise private and public investment in a planned direction. Of course, this method can succeed only if the demand projections do not go wrong. Our experience during the last 35 years has been that the anticipated changes in the income distribution did not come about even though it led us to a system of licencing and regulation opening the floodgate of bureaucratic and political corruption.

1.13 In planning a new social order, because it has to emerge from the old order, the old value such as the "economic man", the "market economy", the "invisible hand" and "individualism" persists. They are inherited and in the process of growth and development new values come up and we should be guarded against mixing these two sets of values. Since planning is a problem of growth which has developed out of history, it cannot be partial. It has to be integral. This explains why problems of planning are problems of transformation and social revolution as against slow and disorganised evolution. In short, it

is a problem of transvaluation and of tempo in time. It is no longer the privypurse, or the privileged civil servant, or the private banking system that provide the blocks to change, but the newly grown power-groups centred round the politicians, the callous and corrupt bureaucrats and the declassed intellectuals who constitute the main block in the path of transition to socialism.

1.14 For the last one decade or more the basic needs approach has been adopted as our strategy of planning for growth and development. The basic needs concept seeks to determine plan priorities, the structure and pattern of production, investment and a whole range of choices. Mitigation of poverty, reduction of unemployment and removal of inequalities in income and distribution of wealth and productive assets have been the objectives. The problem of growth in such a situation would call for a rise in private and public consumption and a significant rise in aggregate output. It has also to be assured that the degree of income distribution is so positive as to enable the poorest to have enough of purchasing power to obtain their requirements from the market or through a system of public distribution. Foodgrains, oil and sugar, kerosene and some clothing have been made available through a system of rationing at controlled prices through the public distribution system. Thus one can notice a dual approach to development:-

(1) An objective of income translated into certain investment patterns directed at the rapid growth of output in both agriculture and industry; and

(2) Investment programmes, institutional reforms and welfare expenditure programmes which are justified on account of their effects on publicconsumption standards.

1.15 The "Minimum Level of Living" or "Minimum Needs Approach" has been adopted by Indian Planners by 1960 as a tool of perspective planning in the country and it was the Fifth Five Year Plan which fully adopted it officially. Special schemes were formulated for the target groups in the following areas (i) elementary education to the children upto the age of 14, (ii) minimum health facilities integrated with family planning and nutrition for children, (iii) rural water supply, (iv) house sites for landless poor, (v) rural roads, (vi) rural electrification, and (vii) slum improvement in large towns and cities. During this plan period, theminimum private consumption expenditure in terms of individual norms for the component items was Rs 40 per capita at the prices of 1972-73. The 1962 Plan document had treated as the target group - the 3rd decile of the population from below - that is 10 per cent of the population. The poorest 20 per cent of the population at the bottom were outside this relief since they were not supposed to get any relief in their abject poverty from the overall output growth. Some amount of income was supposed to trickle down to this target group of the lowest 30 per cent But it was not explained how they will be brought by this method to the targeted consumption level of Rs.40 per capita per month. Clearly, the current level of development is incompatible with our goal of removal of poverty. Since the bulk of the poor are rural poor belonging to the category of agricultural labourers and marginal farmers, it was duly recommended that it was necessary to effect redistribution of the means of production in favour of the poor through a programme and land redistribution and other transfers.

1.16 This was left delightfully vague, because, as the Plan document put it, "redistribution on this scale is operationally meaningless, unless revolutionary changes in property rights, scale of operation and structure of wages are contemplated. Therefore, it is clear that in our accepted design of development, some degree of

inequality of incomes is considered as an essential part of the structure of incentives. It is only logical, therefore, that Indian development strategy relies primarily on the growth process for solving the problems of poverty and unemployment".

1.17 The approach towards anti-poverty programmes in our plans has emphasised the expenditure side of the minimum private consumption strategy and neglected the supply side in terms of essential commodities. Though the per capita minimum expenditure targets were fixed on the basis of consumption norms nationally determined, there was no counterpart plans to produce a supporting structure of goods and services with a view to make the target group to consume the recommended commodities in specified quantities. Perhaps India will have to design a comprehensive and efficient system of rationing which could ensure the minimum private consumption targets, if this has to be successfully achieved on a village to village basis. The system, wherever it works now, does not cover all the items and does not deliver the items in required quantity. It was considered necessary to make the target groups acquire the purchasing power and therefore, special employment and income generation measures were designed for the weak and vulnerable sections of the population.

1.18 The task of pulling up the people below the poverty line to the minimum private consumption level was left to the growth process with the existing inequality of distribution. It was also essential for the economy to grow at an annual rate growth of 7 per cent. In actual practice, however, the rate of growth achieved was only about 3.5 per cent per annum. The result was that the prevailing growth strategy in itself could not be expected to take care of the minimum private consumption requirements. Hence, some kinds of income transfers and social expenditures were recommended for these people. Inevitably the very same strategy and approach continued

for the last 20 years.

1.19 Employment for each able bodied adult has been treated as a minimum level of living target even though "right to work" was enshrined in the constitution as a basic right. We have not yet succeeded in launching any massive attack on the problem of employment. We have indulged in the luxury of adopting different definitions of unemployment with the result no estimate was comparable with another available estimate. The variation reflected changes in definitions more than variations in the level of unemployment. According to the definitions of unemployment we have chosen to adopt, a person is unemployed if only he was available for employment. Whether it was removal of labour surplus or labour reserve, the concept could have meaning only if we had plans to liquidate the problem of unemployment by creation of employment opportunities through precise changes in social organisation, appropriate technology and productive relations. However, the data now available about unemployment in the country could not help one much to understand the precise nature and magnitude of the problem.

1.20 One can think of income distribution in two ways (i) by changing the pattern of income accrual and by vesting ownership rights on labourers working with the assets they use in the process of production and (ii) through a redistribution of disposable income by manipulations of prices, taxes and control regulations. India tried both and in an inadequate measure which perhaps explains our failures in this regard. Our land reform movement was supposed to herald a massive asset redistribution programme and finally to lead to co-operativisation of agriculture. This did not happen and the landless rural poor remained poor representing simultaneously a major share of the urbal poor as well. In many parts of the country largescale evictions of poor tenants have taken place and are still taking place and these evicted people

are swelling the ranks of the landless. Thus, it is safe to assume that the land reforms movement in India has contributed little to the improvement of the lot of the rural poor.

1.21 Price and taxation policies have not contributed very much to the improvement of the lot of these classes but rather benefited the middle and higher income groups. Items like vegetables, fruits, milk, meat, fish, egg and pulses are all left to the mercies of traders and speculators and are fully outside any kind of price control and public distribution. The taxation, deficit financing and neglect of agricultural income matched with current policies on distribution of largesses and subsidies, benefited the rich rather than the poor. Fertilisers, agricultural machineries and irrigation water are distributed at highly subsidised prices to the cultivators. While the bulk of the country's income is generated in agriculture, agricultural income is almost exempted from any tax.

1.22 Free and compulsory education for children upto the age of fourteen is a minimum need. The functional aspects have not been emphasised adequately in the programme Much of present day education does not serve any functional purpose nor does it impart any grounding in appropriate technology. It may be noted that even after three and a half decades of educational planning, education even at the lower levels still remains a commodity. Running of schools and colleges has become very much a lucrative business. Health care still call for improvement in the quality of servicing in the rural areas. The structure that has grown up has emphasised curative medicine and not preventive medicine which has resulted in irrational utilisation of scarce resources. The poor patients do not get the desired medical attention in the hospitals, proper treatment for want of medicines, and the recommended diet. Sufficient attempt has not been made to assimilate indigeneous medical systems

with modern medicines which could have led to more vitality and cost effectiveness. Similarly, there is provision made for rural water supply, rural roads, house sites to the landless and slum improvement as part of the minimum needs programme. These programmes, though well conceived, have not been taken up on a scale large enough to make any impact. Nor was it implemented with commitment and efficiency. The National Rural Employment Programme and the IRDP were meant primarily to create employment and assets of a durable nature in persuance of a locally relevant development plan. This process has sought to achieve creation of durable assets by fully utilising rural surplus labour. The experience during the last 35 years would show that more of the schemes could not achieve the results targeted for reasons pertaining to the structure of the problem rather than conceptual limitations. The problem arise from the fact that as long as there is private property in land, different holders of land would benefit from block scale operations differently. The permanent benefits that would accrue to the families or to individuals would be proportional to the land owned. Even in conceiving projects or programmes, the unchangeable frame-work is the existing land and property relations which act as a major limiting factor on the design and coverage, costs and use of resources and distribution of the benefits. The result is that we have yet to hit on a unit of planning at the local level appropriate to natural and manpower resources that can be combined at an optimum level of managerial efficiency.

1.23 The M.N.P. could not achieve the desired level of success in fighting poverty not because of the defects in the design of the development strategy. Perhaps needed changes in the production pattern of consumer goods and more stress on the import of appropriate technologies should have been insisted. We did not exploit fully the scope for labour intensive and capital saving technology in the fields of construction, transport and

services and land improvement works etc , where we could have made full use of the vast unemployed and underemployed human resources. In the matter of public services designed to meet the minimum needs of the people, the states failed to meet the required volume of income transfer which alone would have ensured qualitative and quantitative expansion of services like education, health, drinking water etc This kind of income transfer and its allocation could not be adequately ensured perhaps for the reason that it favoured the poor as against the rich This also explains why schemes also suffered from ineffective implementation. When the services of dedicated administrative and social workers were called for, often these socially important tasks were left to the less motivated and ill paid and ill-equipped administrative personnel which reflect the relatively low priority the society has given to these tasks The elitist character of the development process is largely responsible for the slow pace of social transformation in this field

1 24 In effect one cannot escape the conclusion that it is a management problem which concerns decisions to what to produce, how to produce. how to reach the products to the target groups etc Naturally, this boils down to the basic question to what is the institutional framework that is necessary for effecting and managing a whole range of social and economic processes, since basic needs have to be conceived primarily as an objective of providing the people with a certain quality of life which can guarantee them the needed dignity and self respect.

1.25 Participation of the people in making decisions which effect them through organisations of their own choice is a democratic ideal which enjoys wide support among people. Multi-level planning, decentralised to the level of blocks and panchayats where every strata of population with their representative intellegentia are

encouraged to participate in conceptualising, programming and implementing locally relevant projects and programmes would alone release the potent national energy for growth, expansion and renewal. Mass participation should be organised under effective leadership appropriate to the task in hand. This approach should ensure the role of individual leaders who are men of character and attainments.

1.26 The problem of poverty in the country is one of slow pace of development and inequitable distribution of the small gains of development. The per capita rural consumption in 1977-78 was Rs.905 per annum and nearly sixty per cent of the rural population lived below this average. Similarly, the per capita urban consumption in 1977-78 was Rs.1305 per annum and nearly two-thirds of the urban population lived below this average. Thus it can easily be seen that the problem of poverty lie embedded mainly in the nature of distribution and the low level of production. Certain reliable estimates show that 40 per cent of the poorest rural population and 50 per cent of the poorest urban population live in appalling conditions even today. It may also be noted that the cost of minimum living not only varies between rural and urban areas but also between rural and urban areas of different regions in the country. The level of per capita consumer expenditure at which a diet with 2250 calories is attained differs considerably from region to region on account of differences in prices and consumer preference.

1.27 During the last three and a half decades of planned development, the per capita private consumption expenditure increased by less than half a per cent per annum. Moreover, even these small gains have not been equitably distributed either. The condition of the bottom 20 per cent of the rural poor has remained more or less stagnant, while the conditions of the botton 20 per cent of the urban poor has in fact deteriorated. The continuous migration of rural poor into urban centres and the growth of slums and pavement dwellings along with unemployment are leading to deterioration in the quality of life. There

is wide-spread frustration leading to aggression and violence. Probably the issues of abject poverty, increasing unemployment and inequality in the distribution of wealth and income constitute the foremost management problem in the country

1 28 The Five Year Plans provided the official perspective of development in the country. The plans covering the period from 1951 to 1985 specified the targets to be achieved, but the gap between the performance and the perspective is glaringly obvious. The projected increases in per capita national income and per capita private consumption were to follow from the targeted growth of national income and the expected reduction in the rate of growth of the population. The rate of growth of the national income depends on the proportion of the net domestic expenditure devoted to net domestic capital formation It is also dependent on the capital out-put ratio which would vary depending on the assumptions of performance of the agricultural sector, the rate of utilisation of the existing unused capacity in industries and the speed with which projects initiated in the past will start yielding expected results. This again is a major management problem on its own right. The official perspective on development is vastly out of line with the actual performance of the economy and therefore, unlikely to be achieved. If one goes by the past trends the per capita consumption will grow at best at 1 per cent per annum which will therefore take more than 50 years for the poorest 20 per cent of the population to reach the minimum desirable consumption standard. There is also the other implication that the pattern of inequality will remain the same during this period. The National Sample Survey figures on consumer expenditure would show that the increases in consumption gained by the poorest sections of the population have been much smaller than those gained by the richer sections. Thus the inequality has grown during the past decades. The available evidence would suggest that poverty

had grown in the absolute sense and in urban areas it has deepened. The goal of providing every one with at least the desirable minimum living would still be far away at this rate. This again should pose a challenging management task for the political and administrative leadership in this country

1 29 An equitable distribution of the gains of development is much more important than a higher rate of overall growth. Without an effective policy to equitably distribute the gains of development the present dispensation seems to be content that the rich would grow immensely richer in the process than it would benefit the poorer classes. There is at present a tendency to close the eyes on the past failures and wish that the future will take care of itself. It cannot be said to the credit of our management at the administrative and political level, if we still go with the smug assumption that the pattern of inequality will remain the same as in the past and that therefore a high rate of growth is all that is needed to abolish poverty. This philosophy will not lift the bottom of the society to the desirable minimum within the foreseeable future It is high time the management in this country realised that the high rate of growth is not a substitute for deliberate policies to ensure equitable distribution of income and wealth

1 30 In the matter of an equitable distribution of income and wealth, a policy of re-distribution of land, adoption of labour-intensive technology and the right to gainful employment is of crucial significance. The employment effect of land reforms can be fully exploited only if small holdings resulting from imposition of ceiling laws and re-distribution of the surplus land to the landless could be organised into viable co-operative farms. New technological advances have made owner cultivation in optimum size farms a viable and profitable proposition. This must be regarded as a socially desirable development. They may be treated as farm businesses which would

come under suitable labour and taxation laws. This process should lead to an organisation of agriculture where each unit will become viable and profitable leading to capital accumulation and development. In the industrial sector, there will take place progressive mechanisation of production and substitution of power for human labour. Unable to compete with high technology and production in quality, variety and cost traditional industries are bound to face a crisis. Any programme of providing work in traditional industries of low technology will have to be supported by direct or indirect subsidies to yield a minimum level of subsistence income This is generally true in all cases of protection given to existing employment in means of production which have become completely obsolete or uneconomic. Hence we have a major problem of transition whose management assumes vital significance in that it will call forth a wide variety of talents at the level of the concept, organisation, innovation and development. The new management should realise that the production of commodity is not one homogeneous activity where we may have a single technology and one capital - employment ratio Sooner or later this unit must adopt improved technology or quit This is the only way technology can progress and labour productivity improve. Care has to be taken not to create or encourage vested interests in inferior technology. Factor endowment is not given and fixed for all time. In this policy mix the most important one is the policy on guaranteed employment at a minimum wage to all those who do not have adequate means of production to employ themselves with and who are willing to work for a minimum wage. All barriers which today stand between a worker and the work he is willing to do must be broken.

1 31 The necessary resources for the works programmes of a magnitude demanded by the size of the unemployment will have to be raised additionally. This additionality cannot be substituted by a reallocation or diversion of present plan resources. The burden of

raising the necessary additional funds should fall on the 10% of the rural and urban rich. The rich must bear it, since they enjoy an average consumer expenditure which is more than 4 times what we wish to assure to the poor. The money resources so raised are not to be used for charity or unemployment doles. The government and the people should be able to create the necessary social organisation, conceive and implement a production and asset creating programme to which the poor will contribute their labour. Here again we have a management problem of the first order.

1.32 Employment planning which meshes with development planning has to be undertaken at a fairly decentralised level on close proximity with persons concerned. The development planning of the area which generate demand for work has to match with the skills and unutilised time of the unemployed and the underemployed. These people have to be located where they are, develop a better understanding of the social and economic characteristics - age and sex composition, their constraints and mobility and compulsions of domestic work and aptitudes. To the extent possible, the planning effort should be directed towards rehabilitating the underemployed in their existing occupations through assistance which would extend the duration of their current employment and make their work more productive. Such assistance would comprise measures like allotment of surplus land, house sites, irrigation, subsidised inputs, credit and marketing and skill upgradation. This would strength their resource base Public works programmes to build up social assets through soil conservation, land reclamation, irrigation canals and drainage, afforestation and social forestry have an important place in income and employment planning. Small scale industries are another instrument which can generate suitable jobs in the nature of self employment. Care should be taken that the technology and the managerial complex associated with the enteprise is simple enough to be within his individual capacity.

1.33 The question of real resources to match the financial resources will still pose the biggest management problem. Any large scale works programme properly conceived should make minimum use of scarce resources such as cement and steel and other scarce commodities. The transfer of incomes to the poor will have to be matched by consumer articles additionally demanded by these people. Large increases are needed in the production of pulses, milk, oil, oil-seeds, vegetables and fruits apart from a commensurate increase in foodgrains. If the supply of commodities needed by the poor is not expanded side by side with the transfer of incomes, it will lead to an increase in the prices of these commodities. In such a situation, it is the poor who will suffer the most and the whole exercise will be self defeating. We do not have at present the necessary organisation and administrative cadres to put through such a massive programme of social and economic transformation at the grassroots level. Soon enough, we may recruit, train and imbibe a whole range of administrative and technical cadres with a relevant ideology of growth and social commitment.

1.34 During the Nehru era India largely succeeded in building up a new state structure which has slowly acquired the capacity to overcome instability caused by communal strife and to cope with the demand of different nationalities based on claims of linguistic, regional or ethnic identities. Planning for development and growth did create conditions favourable to a guided growth of agriculture leading to the creation of the surpluses needed for industrialisation. In the process a class of rich peasantry emerged with its foci of power and political basis spread out in the various states and regions. This has led more and more to the divergence of class interests between agricultural and industrial segments of the national bourgeoisie. The potential power of this rising agricultural bourgeoisie as a political and economic force is recently being recognized even though this rising class is not yet fully in the saddle to determine the balance of class forces. It is in this context that the right of the State as a centralising force and as an instrument

for reflecting the interests of the rural classes came to be consciously developed. During the period beginning from 1969 this tendency became more evident in the development of populous slogans. While the newly emergent classes in the agricultural sector offered stout resistance to any constriction of their interests by the state, lip service to socialism became a convenient facade behind which a policy in favour of the non-ownership classes could be worked out. The nationalisation of 14 commercial banks (1969) and the emergency (1975) represented the crucial features of dynamic state power with its enormous capacity for radical social transformation. Unfortunately this process could not be carried forward to its logical conclusion for sociological reasons.

1.35 Under the Janatha regime a perceptible shift occurred in the balance of power between the class interests represented by the party in power on the one hand and the interests of the locally dominent classes like the regional bourgeoisie of medium and small industries as well as the rich and middle peasants etc. on the other. This has led to the emergence of ruling coalitions at States' level demanding greater devolution of economic and political power voiced forcefully by populist regional and left parties like the D M K and C P I(M). Recently parties like Telugu Desam, the Kerala Congress and the Akalis are cropping up. In all these cases one could notice a restive locally powerful class wanting to exercise power at the State level. The rich peasant interest want to stage a sort of "internal coup" by which they would be able to assume a position of dominance within the ruling classes in their respective regions. This is evident that the agricultural bourgeoisie in India has come to stay at the state level as a dominant class force.

1.36 During 1972-85, India has made substantial progress in the field of heavy and medium industry at the hands of the capitalist class through a major enlargement of private enterprises. This process was further facilitated by the Janatha Government which was relatively free of the burden of the commitment to any form

of socialism It also took the initiative to open up Indian industry to the powerful thrust of foreign capital. The underlying logic of the new approach was fairly straight forward. The Indian National bourgeoisie, relative to its size and capacity, had been starved of the capital necessary for the full development of the productive forces appropriate for establishing on a secure footing capitalist relations of production in Indian industry. A good porportion of its economic activity was still located in the commercial sector It was thriving with the expansion of the internal market and the purchasing capacity of the topmost layers consisting of the 15-20 per cent of the total population which itself has undergone a rapid process of iternal differentiation. At the same time an expanding commercial or market economy could be no substitute for a fully developed capitalist economy that produce enough for internal consumption and competitive export while expanding its base. A rise in proportion of savings in the agricultural sector was finding its way into investment in the industrial sector. But the agricultural bourgeoisie - it is more and more realized lately - could not be prevailed upon against their will to part with any of their surplus for industrial development. Industrial and rural labour therefore has continued to be squeezed through the pressure generated by feudal practices and caste hegemony which dominated our agricultural society. Janatha Government prepared the way for a substantial participation of foreign capital in India. This trend is being continued in the post Janatha period furthering the integration of Indian capital and industry into the world capitalist system.

1.37 The political economy of India during the post-independence period is continuously under the spell of constraints that seem to have blocked the economy's escape from a low level equilibrium trap of slow growth. Extensive agriculture has almost reached its limits. The period of public sector primacy is over. Deceleration has affected those industries (heavy and basic industries) most of which had started off with extremely high rates

of growth whereas consumer goods and intermediate goods in general have grown at low rates all along. This phenomenon cannot be fully explained by either the "limited-home-market" theory or the insufficiency of agricultural demand. The heart of the problem seems to lie in the insufficiency of investment in the economy as a whole because of the squandering of public funds and inefficient utilisation of public investments and public institutions. This situation has led to extremely low capital utilisation, escalation of costs leading to raising of capital-output ratios in individual industries. Consequently, the declining public investments also entail declining private investment by creating supply bottle-necks and demand shortages. It is also seen that gross fixed capital formation in the public sector in 1981-82 was only half of the corresponding total of the economy. This cut back largely affected infrastructural sectors as power, fuel and transport services. Lastly, the rise in the capital output ratios is higher for the public sector than for the private sector which one is constrained to observe that it is due mostly to political and administrative mismanagement. The public sector economy is fast becoming an elaborate network of patronage and subsidies. Direct subsidies by the Central Government on food, fertilizer and exports exceeded Rs.15,000 crores and other subsidies granted by Central and State Governments together amounted to about Rs.3900 crores in 1982-83. The losses on account of public irrigation works, State Electricity Boards and Road Transport Corporations added upto Rs.13,000 crores a year. Overdues to commercial banks were around Rs.1000 crores and that of agricultural credit societies is around Rs.900 crores. Outstanding bank credit to large sick units alone amounted to Rs.15,000 crores in 1981-82. On the other side of the picture are overstaffing, feather bedding, fake pay roles, absenteeism in regular hours and working only for overtime payments. There is also a sizeable amount of pilferage and plundering of public sector goods. This account of corruption and inefficiency is, of course, all too familiar.

1.38 This clearly shows that there is need to insulate our system for economic policy making and its implementation from the clientelist demand of the political process. Unlike Japan or Korea we have failed to insist on the necessary accountability of the public enterprise management to the executive leadership. And this failure of the Indian political leadership to achieve necessary insulation of the economic decision making can be traced to our obsolete system of conflict management and our resilient mechanism for hunting with the hounds and running with the hare in transactions with the proprietory classes with all their internal divisions and regional and caste hierarchies. The disastrous compromise solutions being evolved on crucial questions of choice led upto frittering away of scarce resources which is responsible for the slow rate of the growth of the economy. The State is seen to be highly vulnerable to pressures by all classes and groups - ruling and non-ruling. There is also the nexus between the bureaucrats making use of the instruments of the state power and the many M.L.As and M.Ps and other politicians who indeed act as brokers between different classes and interest groups on the one side and the bureaucracy and leaders of Government on the other for the distribution of patronages. Individual actors may enjoy a lot of freedom of action and yet the policies adopted and their implementation largely tend to serve the long-term interests of the propertied classes and their henchmen.

1.39 Prof. Galbraith (1982) said that "Economic development is capital investment ..... let there be no soft-headed nonsense on this score". But it is certainly not true to say that "you have just supplied capital and everything looks after itself". The operational aspects of planning however indicate that development performance is dependent on both the judicious allocation of investment among competing uses and adoption and absorption of technology and all that goes with it. We may examine the experience of the last 35 years of planning in this respect.

1.40 Despite considerable achievements in savings and investment the net domestic product achieved a compound annual growth rate of 3.4 per cent from Rs.16,798 crores during 1950-51 to Rs.43,804 crores during 1979-80 at 1970-71 prices while the net domestic savings increased from Rs.651 crores during 1950-51 to Rs.17,034 crores during 1979-80 i.e. a compound annual rate of growth of 11.9 per cent. In the process, the net domestic savings increased from around 7 per cent to around 20 per cent. According to Rostow's interpretation with its rate of saving - investment, Indian economy should have entered the phase of self-sustained growth. It is also seen that during this period, the capital output ratio has increased from 2.5 (1950) to 4.8 (1980). (Table 1.1)

Table - 1.1

Average Capital-Output Ratio

Period	Capital-output ratio (actual) Rao (1983)	Capital-output ratio (estimated)*	Index 1950-54=100 (actual)
1950-54	2.50	2.45	100.0
1954-59	2.71	2.73	108.4
1960-64	2.92	3.04	116.8
1965-69	3.43	3.40	137.2
1970-74	3.88	3.79	155.2
1975-79	4.20	4.23	168.0
1979-80	4.58	4.62	183.2
1980-81	4.80	4.72	192.1

Source:- V.K.R.V.Rao, India's National Income 1950-1980 Sage Publications, 1983

*Estimated on the basis of the value of parameters as below.

The trend equation fitted to the data : $(C/o) = a,e^{bt}$

The estimated values $a = 2.3928$

$b = 0.0219$

(0.0011)

$R^2 = 0.986$

(figures in bracket is standard error)

1.41 As more and more capital had to be expended to produce a given output, the growth targets of all the Plans fell short of the estimates. In other words the trends in capital accumulation and the growth of N.D.P. showed that the cost of growth to the economy has increased steadily from Plan to Plan. In a recent study, S.Hajra has shown that the net capital stock in the economy as a whole between 1950-51 and 1979-80 increased at the trend rate of 4.6 per cent and N.D.P. at the rate of 3.4 per cent per annum. These data show that more capital have to be expended to produce a given output in the major non-agricultural sectors. In course of time, it is seen that agriculture also consumed more capital to produce a given output.

Table 1.2

Trend Rates of Growth: Capital and NDP 1950-51 to 1979-80 (Per cent)

	Capital	N.D.P.	Difference
1. Agriculture	4.30	2.02	2.28
2. Forestry and Logging	10.23	3.23	7.00
3. Fishing	8.62	3.85	4.77
4. Mining and Quarrying	9.77	4.48	5.29
5. Manufacturing (a) Registered	7.08	5.55	1.53
(b) Unregistered	7.13	4.05	3.08
6. Construction	4.09	4.77	(-)0.68
7. Electricity,Gas & Water Supply	9.94	9.81	0.13
8. Railways	3.89	4.69	(-)0.80
9. Other Transport	4.55	6.16	(-)1.61
10. Communication	7.21	6.32	0.89
11. Banking & Insurance	3.39	6.93	(-)3.54
12. Real Estates, etc.	2.19	4.29	(-)2.10
13. Trade,Hotel & Restaurant	2.58	4.90	(-)2.32
14. Other Services	3.79	2.17	1.62
Aggregate	4.67	3.42	1.25

Source:- Calculated from NAS data, Feb.1982 & Feb.1983

1.42 The relative size of the N.D.P. originating in agricultural sector declined steadily from 58.70 per cent during 1950-51 to 43.1 per cent during 1978-79, while the share of manufacturing increased from 10.5 per cent to 15.3 per cent. Other sectors also recorded substantial gains. The data presented by Shri S.Hajra show that the sector-wise capital investments during the three decades of planned development has not changed the ranking of the sectors in terms of N.D.P. (Table 1.3).

Table 1.3

N D P Originated in the Sectors by Industry of Origin (In 1970-71 Prices)

	1950-51	% of total	Rank	1978-79	% of total	Rank
1. Agriculture	9859	59.70	1	19969	43.10	1
2. Forestry	212	1.26	9	450	0.97	13
3. Fishing	97	0.58	13	297	0.64	15
4. Mining & Quarrying	126	0.75	12	451	0.97	12
5. Manufacturing:						
(a) Registered	899	5.85	4	4459	9.62	3
(b) Unregistered	755	4.61	5	2654	5.72	4
6. Construction	728	4.33	6	2383	5.14	5
7. Electricity, Gas & Water Supply	39	0.23	15	605	1.30	11
8. Railways	207	1.23	10	731	1.58	10
9. Other Transport	267	1.59	8	1456	3.14	7
10. Communication	63	0.38	14	360	0.78	14
11. Banking & Insurance	158	0.94	11	1295	2.79	9
12. Real Estates	429	2.55	7	1331	2.87	8
13. Trade, Hotel & Restaurant	1416	8.43	2	5749	12.40	2
14. Other Services	1048	6.24	3	1984	4.28	6
Total	16798	100.00		46366	100.00	

Source:- Calculated from NAS Data, op. cit.

1.43 Between 1950 and 1980 the capital output ratio in the economy as a whole increased from 2.50 to 4.80. In the case of different sectors by industry of origin the capital output ratio increased at substantially different rates (Table 1.4).

Table 1.4
Trends in Average Capital-Output Ratio (1960-61 Prices)

	1951-52	1961-62	1971-72	1979-80
1. Agriculture	1.27 (100)	1.49 (117.3)	1.85 (145.7)	2.70 (212.6)
2. Mining & Quarrying	1.62 (100)	2.07 (127.8)	4.06 (250.6)	7.51(463.6)
3. Manufacturing:				
(a) Registered	3.22 (100)	4.20 (130.4)	5.96 (185.1)	7.01(217.7)
(b) Unregistered	1.85 (100)	1.56 (84.3)	2.37 (128.1)	3.53(190.8)
4. Electricity	9.47 (100)	12.34 (130.3)	15.15 (160.0)	17.90 (189.0)
5. Railways	10.37 (100)	11.46 (110.5)	12.71 (122.6)	12.16(117.3)
6. Other Transport	6.21 (100)	5.92 (95.3)	7.07 (113.8)	7.23(116.4)
7. Communication	3.22 (100)	3.63 (112.7)	4.45 (138.2)	5.46(170.0)
8. Trade, Hotel,etc.	2.51 (100)	2.08 (82.9)	1.87 (74.5)	2.70(107.6)
9. Banking and Insurance	1.03 (100)	0.77 (74.8)	0.76 (73.8)	0.77 (74.8)
10. Public Administration	2.32 (100)	4.41 (190.1)	4.20 (181.0)	3.75(161.6)
11. Real Estates	16.08 (100)	17.79 (110.6)	16.88 (105.0)	18.62(115.8)
12. Other Services	... ...	0.90 (100)	2.71 (297.8)	2.33(256.0)
Total	2.46 (100)	2.89 (117.5)	3.70 (150.4)	4.58(186.0)

Source:- V.K.R.V. Rao, op. cit., Table 10.8, p. 158

1.44 Recent studies have shown that the growing accumulation of capital did not directly increase the capital output ratio and that the outcome of the role played by all other factors except capital was such as to increase the capital output ratio by about 3 per cent. In a world of ever changing technology, however, when new investments take place on a large scale it is expected to absorb new technology and help sustain technological transformation and upgradation. With the aid of this new technology, therefore, a given amount of factor inputs should be able to produce a higher output and step up the growth rate. If technology absorption lags behind for any reason, then the opposite may happen (Table 1.5).

Table 1.5
Scale of Investment and Capital Output Ratio

Time period	Scale of Investment	Time variable	Capital Output ratio	
			Actual	Estimated
1951-56	1,513	1	2.50	2.50
1956-60	2,749	6	2.71	2.68
1961-65	3,446	11	2.92	3.01
1966-70	4,403	16	3.43	3.38
1971-75	5,479	21	3.88	3.80
1975-79	7,045	26	4.20	4.26

*Average of capital formation within the interval (at 1970-71 prices)

1.45 Studies by Rao (1983) Brahmananda (1982) and Hajra (1984) show that the contribution of technological progress to growth of N.D.P. is very low in comparison with other countries (Table 1.6).

Table 1.6

Growth Rates of Capital NDP and Technology

Country	Time/ Period	Growth of capital	Growth of NDP	Growth of Technology (TFP)*
1. Japan	1951-71	6.0	6.14	3.6
2. U.S.A.	1960-73	4.0	4.30	1.3
3. Germany	1950-60	6.9	8.20	4.7
4. U.S.S.R (i)	1927-67	6.5	5.25	1 8
(ii) Including IInd World War years		7.8	6.25	2.1
5. China	1952-80	76.8	5.0	0.5
6. Brazil	1950-70	4.14	6.20	2.8
7. Mexico	1950-70	5.9	0.07	2.0
8. Argentina	1950-70	3.2	3.5	1.4
9. Chile	1950-70	3.6	3.9	1.2
10. India	1950-80	4.7	3.5	0.7 to 1.1

*TSP = Total Factor Productivity

As a result, capital investment continues to retain overriding importance, contributing about half of the growth in NDP. Apparently the role of capital in India has been about twice and that of technology only about half of that in the industrialised countries. This clearly shows that:

(i) Indian economy has acquired a remarkable capability to save and invest as large a proportion of NDP as some of the industrialised countries.

(ii) The rate of absorption of technology in the economy and its various sectors hs been very low compared to those countries.

In fact the Seventh Five Year Plan has projected a 5 per cent growth rate and there is criticism that it is much too ambitious on the basis of past experience. The bottleneck seems to be our low rate of technological

absorption. If the present rate of technological progress could be stepped up from the present rate of 1 per cent to 2 per cent the rate of growth of the economy would be stepped up easily to 5 per cent and beyond. With the high rate of saving and investment that the country is having at present it should be possible to attain even higher rates if the nation could be totally mobilised at the sociological, political and information - communication levels to seek and absorb an appropriate level of science and technology.

1.46 In planning for development during the last thirty five years, the strategy and tactics adopted by the planners have not succeeded in creating any visible impact on the unemployment situation in the country. The Government's approach on employment has been consistantly a political-cum-administrative approach rather than growth-cum-management approach. To be effective the political-cum-administrative approach has to be integrated with growth and management efficiency keeping a fair amount of consistency between them.

1.47 As the Dantwala Committee on Unemployment Estimates (1970) has states, "there is clear evidence which indicates that the extent of poverty is much larger than the extent of unemployment and underemployment taken together. This implies that a substantial portion of the poor can be helped primarily through increase in the productivity of their labour in their existing occupations, and providing additional employment is no solution to their below subsistance existence, since they (or most of them) are fully employed. As far as possible, therefore, "the problem of under-employment should be sought to be tackled through measures which would help to extend the duration of employment in the existing farm and non-farm occupations of persons concerned

through intensification and diversification of agriculture and the rural economy". One is also apt to forget in this connection that the low incomes of the chronically poor are also due to the special nature of the institutional arrangements which enable the ownership classes to expropriate the surpluses.

1.48 Solution of unemployment obviously presupposes an understanding of the nature of the problem. Unemployment in an under-developed country is generally different from that occurring from time to time in an economically advanced country. "In contrast to the situation in advanced industrial countries, the problem is one of underemployment rather than mass unemployment; it is primarily agricultural rather than industrial; the phenomenon is chronic rather than cyclical; and moreover, the incidence of unemployment spreads widely over the bulk of the population instead of being concentrated among a relatively limited number of workers". the predominance of agriculture in developing economies, characterised by seasonality in production, household enterprises and uneconomic size of holdings, accounts for widespread underemployment. Unemployment in such countries is chronic because of the lack of complementary resources such as capital, technical and entrepreneurial skill etc., which reflect the backwardness and stagnant nature of their economies. Together with underemployment in traditional agriculture, there is also substantial degree of disguised unemployment. The existing institutional framework including household enterprise, joint family system and general absence of wage employment in the traditional sectors lead to the practice of work sharing. The pressure of population against limited job opportunities and relatively flexible factor proportions in the traditional sectors result in the unemployment of much larger numbers in such economic activities than would strictly be required.

1.49 Underemployment and disguised unemployment are the dominant forms of the employment situation in underdeveloped countries; but, after a stage the emergence of open unemployment is inevitable. The accentuation of underemployment, spread of education, break up of the joint family system, urbanisation, pressure of population and the resultant decline of land-labour ratio etc. drive an increasing number of the labour force to seek employment, as exemplified by the swelling numbers on the live registers of the employment exchanges in our country.

1.50 In our economy the stock of capital goods available is not sufficient to employ the total available labour force on the basis of modern techniques of production. In consequence, two alternatives are open to such an economy. One alternative is employment of the available labour force on the basis of a backward and low income yielding technique of production. This implies low productivity of labour and low per capita real income. The other alternative is the adoption of more advanced techniques of production and higher productivity of labour. This implies however unemployment or underemployment of part of the labour force because the capital goods available do not suffice to employ the whole labour force on the basis of modern techniques of production. The failure to utilise fully the labour force leads to low per capita regional income. Both situations are found in our economy. The first prevails in our indigenous industries where the capitalist mode of production has not yet entered. The second exists in all our modern factory production as well as in agriculture where individual peasant production is replaced by the capitalist plantation system. The latter situation where capital outfit must increase sufficiently to make possible full employment with a value corresponding to modern techniques of production has to be preferred.

This requires capital accumulation. Only the road of capital accumulation leads the economy out of its state of under-development. The essential problem for us, therefore, consists in making the capital outfit increase to the required level within a reasonable short-term. In consequence of the low productivity of labour the surplus of national income over what is needed for the sustenance of the labour force is small. This, however, is not the most important obstacle to capital accumulation. The fundamental obstacle is the fact that such economic surplus as is available is not fully utilised for capital accumulation in our economy. The feudal and commercial upper class who should have developed into our nation-building entrepreneurial class of savers unfortunately tied up in the false value of a decaying social order, use the small surplus produced for conspicuous consumption, i.e., for unproductive purposes.

1.51 It is possible to take either a static or dynamic point of view regarding employment technology. The static point of view threats the ratio of the work-force in different sectors as unalterable and distributes the net annual addition to the labour force according to the existing ratios. This freezes the existing balances in society and views employment mainly in terms of bread alone. The dynamic view on the other hand, posits continuous planning in a wide time horizon which views employment as shifting workers from low material output to higher outputs. The theory of factor-costing seems to be holding its ground with us still in spite of the rigidity of wages. In states like Kerala with large scale disguised unemployment, the theory would hold that the opportunity cost of labour is nil, though the wages have to be equal at least to the level of subsistence. According to this theory there is even a case for valuing labour at less than its wage cost in an economy with surplus labour. "It is then (when there is surplus labour) arguable that the real cost of using labour in cottage industry is zero whereas factory production uses scarce

capital and supervisory skills". There is a concealed confusion in the whole controversy which has to be cleared up. The confusion is between the rate of surplus and the rate of net income flow. The concept of opportunity cost is valid for income measurements but not for estimating the rate of growth what is legitimate for considerations of economic growth is the rate of growth. What is legitimate for considerations of economic growth is the rate of surplus of production over immediate consumption.

1.52 We desire the highest possible long-term rate of growth of our economy, consistent with certain minimum requirements of consumption. The rate of growth depends on the magnitude of the additional investible surplus which in turn depends on the difference between the value created by the worker and his consumption. Given the investible fund and also the standard wage rate for a desirable level of consumption, proper utilisation of the scarce investible resources means that investments should be so channelled as to create maximum possible economic surplus. Investments are broadly of two kinds (1) that which employs a technique (capital intensive) that yields higher surplus per worker but less employment; (2) that which employs a technique (labour intensive) that yields lower surplus per worker but greater employment. Thus if the concept of surplus effect of investment is accepted, obviously the techniques having negative surplus effect are wasteful and hence become undefensible.

1.53 In the foregoing analysis of a plan of industrial development we have seen that we have not only to make decisions on the type of product to be produced but also on the method of producing them or the "technology" to be applied. Have we to construct roads with the help of bulldozers or with the help of spades? Have we to produce textiles with the help of handlooms, powerlooms or automatic looms? Are we to have taxis or cycle rickshaws? It is well known that in certain industries, there is hardly a choice to be made; but in others there is. What is sought to be emphasised here is that it is by no means certain before hand that the most advanced technology is also the optimum technology and that relevant details

should be collected and analysed which may help to take the right decisions.

1.54 An allied question which needs stress in this connection is the great possibilities that will be released by the land reform measures which the Government has thoughtfully put forward. When fully and properly implemented, these measures will remove the built in depressor in the agricultural sector in the shape of rent and share earning interests who take the cream of the land and leave the actual tillers with little sustenance. The removal of the depressor layer from our economy will result in a sudden and extensive expansion of the area of operation of consumer goods and increased absorption of agricultural produce. Thus a big consumption area which has so long been artificially depressed will operate freely and absorb quite a wide variety of manufactured articles. The Government's timely measures of land reform will help to prevent any descending price spiral which would have had the effect of retarding agricultural production which in turn, would have meant a restriction in the use of consumer goods. It was this serious gap in the economic policies of the previous decades that led to the freezing of our consumption goods industries at the out-moded techniques of production. The moment the potential consumer market is released the need for increased productivity of labour and hence adoption of progressive methods of production will be felt keenly and responded to. This situation clearly does not demand of us any downward regulation of technical progress in our industrial sector.

1.55 The experience of the last three decades shows that the political objective of the erstwhile Indian strategy for employment has been to provide ad hoc, low wage and unskilled work. The presumption is that the minimum wage of the rural worker has to have a direct connection with the capacity of the farmer-employer to pay the minimum wages and any employment programme of the State should ensure that the recommended wages should not disturb the low level of existing wages for agricultural labour in the region. Despite heavy

investments in agriculture, irrigation, animal husbandry and employment guarantee schemes, the benefit largely accrued to the rich peasants. These and other employment programmes [Local Works Programme (First Plan), Community Development (since 1953), the Rural Manpower Project (Third Plan), Integrated Area Development Programme for small holders and agricultural labourers (1966) the Pilot Intensive Rural Employment Project (1972), the Employment Guarantee Scheme of Maharashtra (1970-71), Training for Young Engineers (1970), Entrepreneur Development Scheme (1970), Pilot Scheme for Agro Service Centres by the Ministry of Agriculture (1970), Half a Million Job Programme sponsored by the Planning Commission, the Rural Industries Project, Small and Marginal Farmers and Agricultural Labourers Development Agencies etc.] indicate the manner in which the employment objective can be used to strengthen the entrenched vested interests in this class and caste ridden society and be used as an anti-growth instrument. A study on the impact of income growth on employment reveals that our attempts in the past to increase income growth have resulted in a marginal increase in the rate of employment in all the non-agricultural sectors and a decrease in the rate of growth of employment in the agricultural sector. As against this approach the employment strategy should be aimed at making the people below the poverty line non-dependent on the mercies of the ownership classes. Such an employment strategy should, therefore, aim at creation of durable additional employment opportunities which are growth oriented. It should be designed to provide opportunities to the poor for participation in growth opportunities. The poor are poor because they are dependent on the super-ordination implicit in the class and caste hierarchy, ignorant of the rudiments of science and technology, and disorganised and resourceless against the laws of the market mechanism. The sanctity of their customs and traditions impoverish them further through wasteful expenditure on marriages and death ceremonies. In addition inflation and middlemen's exploitation deprive

them whatever is left of their hard labour. Therefore any social organisation for employment in the country should guarantee (i) the right of the poor and the weaker sections like the rural artisans, marginal cultivators, landless labourers and rural women to organise so that they can become productive in a fully participatory democracy, (ii) their right to intermediate and appropriate technology and scientific knowledge, (iii) direct access (without any intermediary) to national resources they need in the process of production like irrigation, credit and marketing facilities. An appropriate social organisation at the grass root level - village, panchayat and the district - may be built up as a basic instrument for productivity and employment and thereby for all-inclusive social transformation.

1.56 The experience of planning for employment for the last three decades has highlighted serious shortcomings endemic to the existing process. There was no serious attempt to relate the process of economic development and planning to resource endowments and needs of the village and the panchayat, which are the smallest units of people living and working at the grass-root level. The result was that we could not tap the potentialities of the region for growth and development in terms of increased agricultural production, development of minor irrigation, small scale industries, manpower development and resource mobilisation. In short, we did much less than we could on the existing level of resource potential. Planning, to be effective, has to be planning from below as against planning from above. This would mean effective involvement of people at all stages of plan formulation and implementation. Therefore it is imperative that the political leadership should decide on a relevant form of organisation for economic decentralisation and participatory democracy. The existing panchayat organisation is a mere form without any real participatory content. It is also outmoded because the Panchayat Raj does not create any resources, nor mobilise

people's innate capabilities nor provide the necessary appropriate technology nor the necessary management training for the local producing, distributing and marketing units in agriculture and industry. The present village or panchayat organisation is not designed to provide opportunities to the poor for the participation in growth-oriented activities. The village poor, the marginal farmers, the landless labourers, the rural artisans and women should be organised and trained in production squads. Their training should be in applied low cost technology as well as management and accounting techniques relevant to the small scale enterprises at the village leve. The distribution mechanism built up in the village should be able to guarantee people's right to receive their inputs without the involvement of middle men. There are a host of such fundamental rights which should be assured through the necessary institutional arrangements which would enable them to function constructively as instruments of social and economic transformation.

1.57 Such a profile of development - based on the concept of social relevance and adaptability - should aim at utilising the talent of the best in agriculture, animal husbandry, artisanship and rural trade and credit. The exploitive habit and device that have been inherited from the past are to be socially controlled if not fully eliminated. We would therefore require a multi-institutional infrastructure - hereinafter called the Development Centre - relevant and assessible for planning and implementing a full employment programme at the village panchayat and the district level. This Development Centre should provide a forum for all citizens interested in the development process to work together to evolve programmes for the effective utilisation of local resources

and should aim as a direct link between the Centre and the concerned experts in Science and Technology, Agricultural University and Government Departments. It should be obvious that in this process of decentralised

functioning the purely administrative approach is neither relevant nor viable. Each work-team forming part of the Development Centre will be an active agent of change and should therefore provide political, administrative and financial will-power and organise science and technology support for their major operational objectives like making the local labour force productive nurturing self-employment and entrepreneurship on the basis of additional purchasing power, starting new and better avenues of production opportunities in the primary sector and then moving on to secondary and tertiary sectors. In such a system of planning for full employment income and growth for the masses of the people, we should mobilise the great resources of the student and the teacher power. It should be possible to mobilise the time, knowledge and energy of the students and teachers in social sciences, medical sciences and technologies for making purposive detailed field work for locating families to be involved in increasing productivity or providing employment. They could also be used to identify exploitative factors and elements in society and for devising concrete measures to counteract them. This wealth of primary inteligentia could do a good job by collecting the required social and economic data for preparing concrete schemes and projects for implementation.

1.58 The Development Centre should consist of 10 to 15 activists dedicated to the service to the people of the locality. Obviously they are to be from prominent leaders of political parties, peasant and workers' organisations,professional groups and representatives of the local bodies. Care should be taken to select people who have a deep and abiding interest in development problems and a minimum of specialised knowledge of the problems in the locality.

1.59 The jurisdiction of each Development Centre will cover, on an average, 30 square kilometres of area with about 4,000 households (20,000 people). The first task of Development Centre should be to prepare for each unit a detailed scientific resource inventory in

respect of land-use, manpower skills available, natural endowments, infrastructure facilities and local financial resources. This group may initiate studies regarding the income distribution, occupational pattern and household savings, consumption and investment with a view to analysing problems of poverty and unemployment. In short this will be the first attempt to make a scientific study of the socio-economic conditions of the population in the locality. The field work of such a detailed survey may be undertaken by the volunteers attached to each Development Centre.

1.60 A detailed programme to enlist the participation of the beneficiaries in identifying worthwhile development projects in Agriculture, Irrigation, Dairying, Fisheries and Social Forestry may be drawn up. A tentative list of panchayat level development activities is provided in Annexure II. In respect of on-going programmes, watch-dog committees may be set up to ensure their speedy implementation. The Development Centre may organise programmes:-

(i) to help the Government in realising the tax dues to Government at the appropriate time and to intervene to prevent evasion by tax dodgers, to detect activities like black marketing, smuggling and such other anti-social activities;

(ii) to spread the message of family planning to every household in the Panchayat;

(iii) To promote awareness among the people of the role of science in increasing agricultural production, in eradicating superstitions and obscurantism;

(iv) to promote the habit of thrift and savings in the community;

(v) to cultivate civic sense, love of public property and discipline; and

(vi) to promote cleanliness and hygeine in pursuit of a healthy environment for living.

1.61 There will be about 1000 Development Centres in the State. Each district is, thus, composed of about ninety Development Centres. It is necessary to have a co-ordinating body at the district level so that the work of individual Centres of the districts is tailored to conform to the overall development strategy, production pattern and targets envisaged for the District as a whole. To be effective and meaningful, the District Co-ordinating Body should have adequate representation in the District Development Council. In the system of decentralised administration envisaged under the Panchayat Raj, the District Development Council is to be a fully elected body whose Chairman will be the head of the district administration and Collector of the District will, for all practical purposes, act as the Secretary to this Council, having administrative control of the district officers of the development departments. In the context of the new set up where Development Centres will start functioning effectively, it is not possible to insulate the District Development Council from the ninety and odd Development Centres in its jurisdiction. The problem is how best to integrate the Development Centres in the Panchayats and their Coordinating Body at the district level with the Development Administration. This integration could perhaps be effected by providing adequate representation of the Development Centres through their Co-ordinating Body at the district level in the D.D.C. If no such arrangement is made, these Bodies are bound to work at cross-purposes leading to a lot of friction and avoidable waste of human energy.

1.62 At the State level, it is necessary to have a Policy Planning Committee which can provide effective leadership both at the technical and political level. This Committee should have at its disposal first hand information regarding the latest developments in the

economy which will necessitate the setting up of a small, but highly competent Secretariat. It is the duty of the Secretariat to monitor relevant information for members so that any failure anywhere in the system is detected in time and effective remedial action is taken. Success of the scheme is entirely dependent on the efficiency with which this apex body can perform its duties without fear or favour.

1.63 Any voluntary organisation to be built up to provide development services and that too in a multi-party system cannot but be advisory in its activities. However, if the technical and political cadres constituting the Development Centres, the District Coordinating Bodies and the State level Policy Planning Committee are motivated, trained and dedicated, they can surely provide the necessary impetus for speedier implementation of development programmes. They could also provide the necessary vigilance to see that the benefits of development reach invariably the weaker sections of the society as against the affluent who presently reap most of the benefits. This is a key role which would ensure income distribution in favour of the poorer sections of the society; prevent growth of vested interests and keep under control the negative tendencies of the present bureaucratic administrative system. This can ultimately pave the way for achieving full employment of the labour force. All these presuppose a relevant social philosophy to guide and order the planning process. Fortunately, the country has finally opted for socialism which should be able to provide the necessary philosophical basis for structuring a democratic alliance pattern necessary for the mobilisation of all sections of the people which alone can ensure full popular participation. The essence of people's participation in planning, execution and evaluation is the willingness on the part of the political leadership to be with the people leading them towards the clear goals set within a time horizon.

ANNEXURE I

It is essential to evaluate how far the planning strategy so far followed has helped to create employmnt along with higher economic growth. The usual procedure adopted in such studies is to work out a model bringing out the relationships between changes in economic structure and income per head. An attempt has been made to use a model which is a variant of the basic Chenery Model to quantify the relationship between sectoral employment, income growth and population increase. The following employment function has been used for this purpose.

$$Li = A\ Y^{ai}\ L^{bi}\ P^{ci}$$

Where
Li = employment in the ith sector
Y = total state income
P = population
L = labour force

ii. The model has been fitted using standard regression techniques on the cross section data on employment, incomes and population for the different States in the Indian Union. The data relate to the different States in the Indian Union for the year 1971.

The results from this exercise are given in Table I.

Table I

Partial Elasticities of Employment with Respect to Income and Labour Force

Sector	Elasticity Coefficient of	
	Income (a)	Labour (b)
1	2	3
1. Agriculture	-0.276	1.165
	(0.102)	(0.198)
2. Manufacturing	1.185	0.756
	(0.352)	(0.685)

Contd....

1	2	3
3. Construction	1.029	2.685
	(0.281)	(0.547)
4. Trade & Commerce	1.031	0.008
	(0.314)	(0.612)
5. Transport & Communication	0.748	0.367
	(0.331)	(0.646)
6. Services	0.446	0.392
	(0.183)	(0.356)

iii. Elasticity co-efficients indicate in percentage points the effect of one per cent change in either income or labour force on that of employment in each sector. For example, a one per cent increase in income (say from 4 to 5 per cent per annum) leads to a 0.276 per cent fall in the employment in agriculture and to a 1.185 per cent increase in the employment in manufacturing, assuming that the rates of growth of the labour force remain unchanged. These independent (or partial) effects of income and labour force are given in Cols. 2 and 3.

iv. The results show that the development strategy based on increasing income growth which is usually adopted by all the States, will have different effects on employment growth in the different sectors. It is seen that an increase in the rate of growth of income increases the rate of employment in all the non-agricultural sectors. The major increase is observed in the manufacturing, construction and trade and commerce sectors.

v. Another conclusion which comes out clearly is the large positive (partial) effect of labour-force growth on employment in agriculture and construction sectors. This is a striking confirmation of the traditional nature of the agricultural sector in India. Agriculture and construction sectors absorb excess labour available in the economy. The faster the rate of growth of labour force the greater will be the proportion of the labour force employed in agriculture and construction sectors given the rates of growth of income and population.

ANNEXURE II

List of Panchayat Level Development Activities

I. AGRICULTURE

1. Development of minor irrigation
2. Installation of community pumpsets
3. Renovation of disused community tanks
4. Water management and proper use of water for irrigation.
5. Development of proper drainage in paddy fields
6. Construction of wells for irrigation
7. Soil conservation measures
8. Popularisation of high yielding variety seeds for paddy cultivation
9. Application of optimum dosage of fertilizers
10. Adoption of pest control measures
11. Organising community operations in rice lands (common nursery, appropriate variety of seedsetc)
12. Utilisation of summer fallow paddy lands for growing crops like pulses, green manure, fodder etc., as short during crops depending on the required level of moisture.
13. Planting of perennial crops on upper slopes

14. Replanting and gap filling in coconut gardens and other such lands (pepper, nutmeg, cinnamon, banana, ginger, tapioca, cocoa etc., wherever feasible).
15. Cultivation of green manure crops
16. Making compost from waste
17. Kitchen garden in every home
18. Organisation to procure and market vegetables.
19. Small tractors
20. Power tillers
21. Pumpsets
22. Other improved agricultural implements
23. Repairing service

II. CO-OPERATION AND CREDIT

1. Membership campaign
2. Arrangement through co-operatives the supply of inputs to farmers
3. Educating the farmers on the economic aspect of co-operation
4. Organising irrigation co-operatives.
5. Campaign for arrear collection of co-operatives
6. Securing consumption loans for farmers
7. Education on the role of co-operatives in marketing
8. Developing marketing societies
9. Deposit mobilisation drive
10. Assisting weaker sections for getting credit from rural banks

III. MARKETING

1. Marketing co-operatives
2. Regulated markets and marketing yards
3. Warehousing facilities
4. Grading and quality control

IV. SOCIAL FORESTRY

1. Tree planting campaign (soft wood trees in public lands)
2. Planting of cashew in the sandy coastal areas
3. Raising and distribution of fuel wood
4. Soft wood cultivation by planting ailanthus along the fence
5. Cultivation of fodder trees and shrubs along the fence

V. ANIMAL HUSBANDRY AND DAIRYING

1. Rearing milch cattle
2. Goat rearing
3. Piggery
4. Poultry
5. Formation of milk co-operatives for procurement and distribution of milk and milk products
6. Cold storage facility for fish, dairy and poultry products
7. Propagation of cross bred cattle through artificial insemination
8. Recycling programme of cow dung and fodder in homesteads.
9. Compulsory castration of indigenous bulls
10. Gobar gas.

VI. FISHERIES

1. Development of pisciculture in tanks
2. Rearing flash in community tanks

VII. HOUSEHOLD INDUSTRIES

1. Identification of traditional skills in the locality
2. Assessment of raw material requirements so as to ensure timely supply
3. Design and production to suit the changing consumer demand.
4. Organisation of training programme for crafts-men-artisan
5. Liaison arrangements to tap bank credit for this programme
6. Marketing of finished products.
7. Popularising the use of such products

VIII. RURAL ROADS AND INLAND WATERWAYS

1. Identification of major link roads connecting markets, educational institutions, health centres etc.
2. Organising voluntary surrender of lands for new roads or widening of existing ones
3. Cleaning of village tanks and providing necessary outlets and bunding to prevent pollution.
4. Construction of culverts wherever necessary
5. Maintenance of roads
6. Maintenance of waterways and canals
7. Planting and maintenance of avenue trees
8. Public comfort facilities near market centres
9. Public comfort facilities to be made compulsory in petrol bunks on highways

IX. MINIMUM NEEDS PROGRAMME

1. Rural drinking water facilities
2. Steps to assure replenishment of basic life saving drugs in the rural dispensaries and chemist shops
3. Cleaning up public wells
4. Renovating wells used by weaker sections of society
5. To help organise nutrition programme by organising local contribution (fuel,utensils etc.)
6. Identification of locally available food materials and popularising them

X. SOCIAL REFORM ACTIVITIES

1. Eradication of illiteracy
2. Programme for adult education and library movement
3. Explaining the role of science and technology in rural development
4. Campaign against superstition, castism, untouchability, alcoholism, expensive marriages and social functions, dowry and conspicuous consumption
5. Encouraging community marriages
6. Vigilance against economic offences such as smuggling, tax evasion, adulteration
7. Identifying surplus lands.
8. Assistance for developing lands assigned to landless labourers
9. Resumption of land alienated by tribals
10. To identify, free and rehabilitate bonded labour
11. To organise cultural and recreation activities
12. To give new form and social content to traditional festivals

13. Verification of weights and measures in shopping establishments

14. Identification of eligible couples to accept family planning.

15. Educating the masses on family planning programme

16. Follow-up of acceptors of family planning programmes with a view to sort out social and psychological problems, if any

XI. HEALTH AND HYGEINE

1. Education for a healthy habitat

2. Popularisation of E.S.P. type latrines

3. Vaccination campaign (small pox, cholera, polio, B.C.G.)

4. Encourage voluntary blood donations

5. Control of mosquito

6. Organising health camps

XII. HOUSING

1. Identification of houseless families

2. House building programme, utilising locally available materials

3. Popularising various housing programmes of the Government

4. Popularising low cost housing

XIII. LOCAL RESOURCE MOBILISATION

1. Promotion of saving habits

2. Small savings campaign

3. Fight against usurious money lending practices and rural indebtedness.

CHAPTER II
AGRICULTURE

The performance of Indian agriculture since 1950 has been quite significant viewed against our experience of pre-independence period. Crop production rose at an annual rate of 2.8 per cent during 1951 to 1977 and at 3.5 per cent during 1977 to 1984 along with substantial and sustained improvements in cultivation practices such as use of water, fertilizer, better seeds and plant protection chemicals (See Table 2.1).

Table 2.1

Annual Rateof Increase in Production Between Triennia Ended 1951-52 to 1976-77 and 1976-77 to 1983-84 for Selected Crops - All India

Crop	Annual rate of increase (%)	
	1951-52 to 1976-77	1976-77 to 1983-84
1	2	3
1. Rice	2.7	3.3
2. Wheat	5.7	7.5
3. Other Cereals	2.0	2.1
4. Pulses	0.7	0.8
5. Total - Foodgrains	2.8	3.7
6. Sugarcane (Gur)	3.1	3.8
7. Rubber	9.2	2.6
8. Tea	2.3	2.6
9. Coffee	5.7	2.6
10. Total - Non-foodgrains	2.6	3.1
All Commodities	2.8	3.5

Annual Rate of Increase Between 1950 to 1985

2.2 Productivity of all the crops has registered substantial increase over the period 1950 to 1985 (Table 2.2).

Table 2.2

Average Yield of Principal Crops

(Quintals per hectare)

Crop	Yield per hectare	
	1976-77	1982-83
1	2	3
1. Rice	10.9	12.3
2. Wheat	13.9	18.4
3. Sugarcane (Gur)	55.3	56.2
4. Tea	14.0	15.4
5. Coffee	5.4	6.5
6. Rubber	8.1	8.3

Source:- (1) Statistical Abstract India 1978, C.S.O.
(2) Basic Statistics Relating to the Indian Economy, Vol.I, 1984, CMIE
(3) Economic Review, 1984, S.P.B., Kerala

Average Yield of Principal Crops

2.3 The potential productivity in India is much greater if we take into account (i) the advantage of modern scientific knowledge for increasing productivity of land, (ii) the low level of intensity of land use and cultivation practices and (iii) the fragmented social organisation inhibiting communal action which needs to be drastically reorganised so as to ensure larger people's participation and assimilation of modern values. At the beginning, a degree of optimism, therefore, was well justified and given the low productivity and technological level of Indian agriculture, rapid growth would

have been relatively easy to achieve by a combination of massive investments in irrigation and production of fertilizers, supported by extension service and credit. But after more than three decades of development on these lines it is disturbing in the extreme to find that growth rates of production had not increased but had, in fact, fallen (Table 2.3).

Table 2.3

A Comparison of Growth Rates Between 1949-50 to 1964-65 and 1967-68 to 1983-84

Item	Annual trend rate of increase %	
	1949-50 to 1964-65	1967-68 to 1983-84
1	2	3
1. Foodgrains		
(a) Area	1.4	0.3
(b) Production	3.0	2.5
(c) Productivity	1.4	1.9
2. Non-foodgrains		
(a) Area	2.5	0.9
(b) Production	3.5	2.5
(c) Productivity	0.9	1.4
3. All Crops		
(a) Area	1.5	0.4
(b) Production	3.1	2.6
(c) Productivity	1.3	1.8

Source:- Agricultural Production in India. State-wise and Crop-wise Data. Feb. 1985, CMIE.

2.4 There has been a slowing down of agricultural

growth during the last decade. In the context of an acceleration of population growth, this resulted in a near stagnation in agricultural output per capita. In this connection it may be noted that almost anything can be proved regarding rate of growth in production by taking different base years and periods for comparison. For example, as seen from the periodisation adopted above, the rate of growth from 1951 to 1977 was 2.8 per cent and from 1977 to 1984, 3.5 per cent. However, the rate of growth from 1950 to 1965 was 3.1 per cent and from 1967 to 1984, 2.6 per cent. As can be seen from the year statement in Table 2.4, the fact seems to be that Indian agricultural production is a raising but undulating curve. There are cyclical changes in production, the drought years marking low production. With the passage of years, the low production during the drought years has been going up progressively. Thus the index number of production in drought years of 1965-66 and 1966-67 was around 77, while in the drought year of 1972-73 it was 102.3 and in the drought year of 1979-80 it was 114.8. The sharp increases in agricultural production took place early in the plan period and later during the end of 1960s. In view of this, it would be better to rely on Table 2.4 which covers the period of over 30 years for our assessment and indicate the trends and the cost thereof. Undoubtedly, in the earlier years it was due to increase in area. In the late 1960s it was due to green revolution. The extension of cultivation to new areas has more or less come to a standstill in recent years(Table 2.4).

2.5 In our rather formalistic society, the relation between targets and programmes are dealt with in a loose manner. The Five Year Plans indicate (a) the targeted levels of production in the aggregate and for principal crops (b) the targeted levels of use of major inputs* and (c) the set of policies and institutional framework to ensure that the farmers get the inputs at the desired

time and make effective use of them. The quantitative relation between inputs and outputs for specific climatic and geological regions are not discussed in clear terms.

Table 2.4

Index Number of Area, Productivity and Production of Foodgrains - All India

(Base: Triennium ending 1969-70 = 100)

Year	Area	Productivity	Production
1	2	3	4
1951-52	79.4	74.2	57.7
1955-56	90.8	82.9	72.6
1956-57	91.2	85.0	75.9
1960-61	94.8	93.1	86.1
1961-62	95.9	92.1	86.8
1965-66	94.5	81.4	75.8
1966-67	94.7	82.6	77.1
1967-68	99.7	99.9	98.7
1968-69	98.9	98.2	97.3
1969-70	101.4	101.9	104.0
1970-71	102.0	109.9	112.9
1971-72	100.6	107.8	111.4
1972-73	97.8	101.4	102.3
1973-74	103.7	105.0	110.3
1974-75	99.2	102.2	104.3
1975-76	105.0	117.2	127.2
1976-77	101.9	109.1	115.7
1977-78	104.5	122.1	133.6
1978-79	105.7	125.5	139.3
1979-80	102.6	106.2	114.8
1980-81	103.0	127.0	137.5
1981-82	105.0	128.0	140.5
1982-83	104.5	123.0	135.7

Source:- Agricultural Production in India - State-wise and Crop-wise Data - 1949-50 to 1983-84. Feb. 1985, CMIE.

Therefore, agriculture planning as practised presently does not give even rough estimates of the expected contributions of different input items to output growth. The adhocism now practised is unwarranted.

Table 2.5

Index Numbers of Cultivated Area, Agricultural Productivity and Production - All Commodities

(Base: Triennium ending 1969-70 = 100)

Agricultural year (July-June)	Area	Productivity	Production	Per capita Production
1	2	3	4	5
1951-52	79.7	76.6	59.4	92.2
1955-56	90.0	83.9	71.9	103.8
1956-57	90.8	86.5	76.2	107.8
1960-61	94.5	94.4	86.7	112.4
1961-62	96.6	92.2	86.8	110.1
1965-66	96.1	84.3	80.8	93.9
1966-67	96.0	85.3	80.7	91.8
1969-70	101.4	101.5	103.8	108.1
1970-71	102.5	108.4	111.5	116.0
1971-72	101.9	107.6	111.2	113.1
1972-73	98.7	101.0	102.2	101.7
1973-74	104.5	106.3	112.4	109.3
1974-75	100.8	104.6	108.8	103.4
1975-76	105.9	115.6	125.0	116.2
1976-77	103.2	109.2	116.2	105.5
1977-78	106.5	119.6	132.8	118.0
1978-79	108.1	122.2	137.9	119.8
1979-80	104.2	107.6	116.9	99.3
1980-81	105.2	123.5	135.2	112.3
1981-82	105.3	130.0	142.7	116.0
1982-83	104.5	127.0	137.0	108.9

Source:- Basic Statistics Relating to the Indian Economy Vol.I, Aug. 1984, CMIE.

*Table 2.6

Fertiliser Consumption in India

(Thousand tonnes of nutrients)

Year	Consumption	Consumption per hectare of cropped area (Kg.)
1	2	3
1951-52	66	0.6
1955-56	131	0.9
1956-57	154	1.0
1960-61	294	1.9
1961-62	339	2.2
1965-66	785	5.1
1966-67	1101	7.0
1967-68	1540	9.4
1968-69	1761	11.0
1969-70	1982	12.2
1970-71	2256	13.6
1971-72	2657	16.1
1972-73	2768	17.1
1973-74	2839	16.7
1974-75	2573	15.6
1975-76	2894	16.9
1976-77	3411	20.4
1977-78	4286	24.9
1978-79	5118	29.2
1979-80	5255	30.0
1980-81	5516	32.5
1981-82	6067	35.0
1982-83	6418	37.3
1983-84	7800	44.8
Annual rate of increase (%) between 1951-52 and 1983-84	16.1	14.4

Source:- Basic Statistics Relating to the Indian Economy Vol. I., Aug. 1984, CMIE.

2.6 The targets of irrigated area of 2 million hectares per year seem to be highly notional. Honest field work by way of surveys and site investigations have yet to be done so as to generate properly investigated and engineered proposals for medium and major projects. Of course, Government departments often make the irresponsible claim that they have a large enough stock of well-worked out projects on the shelf. But past experience is replete with far too many instances of bad planning and delayed implementation leading to escalation of costs which make them, very often uneconomic.

2.7 Along with quantitative expansion, a major effort to improve the quality of irrigation is essential. Optimum performance of new seed varieties on which much of the hope for large output expansion rests, is crucially dependent on assured, adequate and timely supply of moisture in relation to plant water requirements. This calls for a degree of sophistication in water control and management which cannot be attained without major changes in the design and operation of irrigation systems. The problems are of a physical and technological nature, and arise from inadequate attention to construction and maintenance of field channels to carry water from Government outlets to individual plots; failure to provide adequate draining facilities; excessive losses in conveyance of water from source to the field; wastage due to the neglect of levelling, bunding and other measures to properly prepare the land for irrigation and the excessive rigidity of irrigation schedules and rules governing these schemes.

2.8 There is very strong resistance from the present ownership groups to the implementation of other essential pre-requisites of efficient water use, land development and reclamation works, consolidation of holdings, and evolution of an optimal cropping pattern.

Any integrated planning of land, water and cropping involves a thorough overhaul of the existing industrial arrangements. It is time the planning authority and the political leadership give the necessary attention to these complex problems. The lack of a viable institutional framework is an extremely severe constraint on the extent to which the efficiency and productivity of India's land, water and crop resources could be fully tapped. A serious weakness of the present day Government approach lies in their tendency to view this organisational problem as one of strengthening the official machinery which clearly is erroneous.

2.9 Above all, the employment effect of land reforms, land development, water resources development, optimum crop mix, pattern of contour bunding, soil conservation, social forestry, etc. has not been fully explored yet. Research and development effort and changes in organisational structure are clearly called for.

2.10 A recent study by Dr.C.H.Hanumantha Rao has clearly brought out that surpluses with the Government can co-exist with, and are in fact traceable to, increase in the poverty and unemployment in large parts of the country. The changing composition of foodgrains output as well as its regional concentration has meant lower consumption of foodgrains in the rural sector as employment generation under such a pattern would be lower. A number of studies on the performance of agriculture have shown that the labour co-efficient or the increase in employment as a result of a unit increase in output is much lower in the developed pockets and among the large farms.

2.11 The inverse relationship between farm size and output per acre noticed under traditional labour-intensive technology in mid-50s has now disappeared in many of these developed pockets as a result of the introduction of new technology which is capital-intensive and has,

Table 2.7

Pattern of Land Utilisation: 1950-51 & 1980-81

Land use	Million hectares		% to total	
	1950-51	1980-81	1950-51	1980-81
1	2	3	4	5
A. Not Available for Crop Agriculture	159.1	147.2	48.3	44.8
a. Land put to non-agricultural uses	9.4	19.5	2.9	5.9
b. Barren & unculturable land	32.8	20.2	11.6	6.1
c. Land under forests	40.5	67.4	12.3	20.5
d. Land under miscellaneous trees	19.8	3.5	6.0	1.1
e. Pasture land	6.7	12.0	2.0	3.7
f. Data not available	44.5	24.6	13.5	7.5
Of which under illegal occupation of				
(i) Pakistan		7.9		2.4
(ii) China		4.3		1.3
B. Available for Crop Agriculture	169.7	181.6	51.7	55.2
g. Under crop agriculture	118.7	140.3	36.1	42.7
h. Fallow land	28.1	24.6	8.6	7.5
i. Culturable waste	22.9	16.7	7.0	5.0
Total Geographical Area (A+B)	328.8	328.8	100.0	100.0

Source:- Basic Statistics Relating to the Indian Economy, Vol. I - All India (August 1984), CMIE.

therefore, been increasingly adopted by the large farms. This higher rate of growth among large farms has been attained by the substitution of capital for labour leading to lower share of wage income in output. Another important phenomenon emerging from this experience is that the rising surpluses with the Government have been associated with a lower rate of growth of agricultural output. This is contrary to the general assumption that greater inequality leads to higher savings, higher rate of growth of output and consequently, a high rate of surplus. In the present case, increase in surpluses is, no doubt, due to increase in equality but this is not associated with the higher growth rate of output. It would be interesting to investigate into this implied complementarity between growth and better income distribution under conditions of large under utilised resources like labour and land.

2.12 The comfortable position in regard to foodgrains stocks with the Government may give rise to the idea that a massive rural works programme should be launched to relieve rural unemployment because there are enough foodgrains to support the demand likely to be generated by such a programme. A similar situation had, in fact, arisen ten years ago and several crash programmes for employment were launched which proved to be transitory and had a large inflationary impact. This raises a fundamental question about the strategy of agricultural development consistent with the removal of rural poverty and unemployment. The alternatives

in this respect are dramatically brought out by the present situation. The first alternative is the one which has been actually followed, namely, to concentrate resources in the limited prosperous areas where the income elasticity of demand for foodgrains is low and, therefore, there is an assurance of substantial surpluses which can, in turn, be used for supporting a massive rural works programme. Such a programme becomes necessary because of the particular strategy of development followed. The second alternative is to widen the base of agricultural output growth by allocating resources among the low productivity regions and small farms where the employment potential per unit increase in output is higher and the income elasticity of demand for foodgrains is also higher. This may give a high rate of overall output growth but may not necessarily yield large marketed surpluses per unit of increase in output. The strategy may, nevertheless, yield sizeable surpluses because of higher overall rate of growth.

2.13 If agricultural output did, in fact, grow at the rate of about 4 per cent per annum - the minimum envisaged in the Five Year Plans - employment in the production of agricultural commodities would alone have grown by at least 3 per cent per annum as the labour co-efficient (i.e. percentage increase in labour input as a result of 1 per cent increase in output) is likely to be around 0.75 for all the techniques (e.g.,irrigation, multiple cropping, H.Y.V., etc.) taken together. Indeed, the employment generated would be more than proportionate to increase in output if additional output is realised through investment in irrigation in areas where labour is abundant.

This is evident from recent studies which shows that under traditional labour-intensive farming in mid-fifties man-days employed per unit of output was invariably higher for irrigated farming. Employment per unit of output was, however significantly lower in Amritsar, Ferozepur, Meerut and Muzaffarnagar Even in mid-fifties they were known to be generally areas of relative labour scarcity when compared to other parts of the country The shift from unirrigated to irrigated farming led to a more than proportionate increase in the labour input in relation to output. However, in Amritsar, Ferozepur, Meerut and Muzaffarnagar, the labour co-efficient was significantly less than unity.

2.14 The employment generated in the process of agricultural production would be in addition to the employment that would be generated in marketing and distribution of additional output, in the production and distribution of additional inputs and consumption goods and in the service sector. The growth in employment as a result of 4 to 5 per cent rate of growth in agriculture would be sufficient to absorb not only the growing labour force in agriculture, but would also help to clear much of the backlog of rural unemployment and under-employment. This is because, the growth of labour force in the rural sector would be significantly less than the growth of population owing, among other factors, to the migration to urban sector and to the fact that in the initial phases of development, in the lower income areas, as the income level increases, the participation rate of the unskilled labour, particularly females declines significantly.

2.15 It is not accidental that the idea of the Employment Guarantee Scheme and massive rural works programme has found strong support and is being implemented in some States. The foodgrains output has virtually

remained stagnant in a State like Maharashtra during the last decade and the increase in the non-foodgrains output such as sugarcane has been concentrated in the prosperous belt with very low employment potential. The percentage of area irrigated to total cultivated area is only about 8 per cent in Maharashtra which is almost the lowest among all the States. According to the available data, however, about one-fourth of the cultivated area can be brought under irrigation and as much as 68 per cent of this potential remains unutilised. In a recent study of agricultural performance in Maharashtra, Nilkanta Rath concludes that (i) It is quite clear that agriculture in the State cannot register progress unless irrigation is provided over much wider area and the new seeds are suitable and economical for adoption under unirrigated conditions. The failure of the hybrids points to the direction in which research effort may help. (ii) Irrigation is very expensive, and is being used in a concentrated way to benefit only one or two per cent land and as many farmers. It is worth examining if this water could be made available to grow seasonal crops, thereby irrigating a much wider area and stabilising agricultural production, which may help push up the growth rate". It is clear that the lower rate of public investment in irrigation and misallocation of scarce irrigation water are at the root of growing rural unemployment in Maharashtra.

2.16 The Rural Works Programme designed to strengthen the land base of agriculture, e.g. soil conservation and minor irrigation through consolidation of holdings as part of the plan for achieving the targeted growth of agricultural output would be non-inflationary in character and would provide the basis for the sustained growth of output and employment as and when such productive works are completed. But the Rural Works Programme, envisaged essentially as a means to provide employment, because growth of output has been slow

and is likely to be slow, would have an inflationary potential. Indeed, the programme as it has been actually operating has been inflationary.

2.17 The Rural Works Programme as a basic strategy to provide employment in rural areas is likely to involve huge outlay constituting about 25 per cent of the Plan investment. This proportion is approximately equal to the Plan outlay for agricultural sector allocated so far. It would, therefore, be necessary to examine the relative costs and benefits of Rural Works Programme versus investment programme for agriculture as a means of agricultural growth and employment generation. There are no doubt two alternative strategies of agricultural development. The strategy of concentrating on productive areas for increasing agricultural production had to be followed in the late 1960s in view of the compelling need to free the country from imports. The experience of food imports in 1965 and 1966 was so traumatic - the ship to mouth existence that it resulted in - and the experience of the stoppage of food aid following the Bangladesh war was so insulting that it became a national imperative to quickly become self-sufficient in food grains. While considering the two alternative strategies it is better to appreciate this objective position also. The first alternative had to be followed for a number of years as a result of the urgent need to increase production and free the country from imports. The consequence of persisting in that strategy are stated in paragraphs 2.16 and 2.17. It is time therefore to launch the strategy of widening the base of agricultural growth involving the under-utilised resources in the low productivity regions.

2.18 The alternative strategy of widening the base of agricultural growth involving the under-utilised resources such as labour in the low productivity regions, would have a large employment potential and this could

be generated in the process of agricultural growth. This, no doubt, requires public investment but the difference between public investment in infrastructure like rural electrification, major and medium irrigation projects is that whereas the former is totally dependent on public investment to generate employment and essentially increase the effective demand for wage goods, the latter strategy complement resources from the individual farmers with public investment and increases the output of wage goods while generating significant demand for them. The former strategy would be all right if the basic problem is to raise the effective demand for wage goods so as to stimulate private investment in the production of such goods. However, increase in effective demand through such a strategy stimulates production only in those areas where public infrastructure is well developed and where the existing resources may already be better utilised. The latter strategy, on the other hand, by widening the infrastructure facilities in new areas stimulates private investment among sectors where the resources of land, labour, etc. are underutilised. The capital output ratio among such sectors is generally low because in of the abundance of labour. Besides, the increase in the essential consumption by the poor may also raise their efficiency, contributing to a further decline in the capital output ratio. Harvey Leibenstein shows that in poor economies, there may exist, upto a point, a more than proportionate relationship between increase in calorie intake and increase in productivity. Since much of the capital formation in a labour intensive agriculture is of non-monetary type, done through the use of labour, especially during the off-season, it is conceivable that the lower saving ratio of the small farmers in low productivity regions could be more than compensated by the improvement in the output capital ratio and non-monetary capital formation over wide areas, so that output could grow faster under such a

strategy. Further, such a growth process ensures that gains of development accrue to the poor sections.

2.19 Public investment in agriculture may broadly be classified into two types: (a) infrastructural investment in physical assets directly made by the Government such as rural electrification, major and medium irrigation projects, roads, etc. which benefit all classes of farmers roughly in proportion to the area held by them; (b) public investment in the institutional infrastructure such as institutional credit, which supports private investment and in principle, can benefit all the classes of farmers. This can even be designed and implemented to benefit essentially the poor classes.

Labour Input and High Productivity per Hectare

2.20 Experience of countries in East Asia - especially Japan - shows that they could achieve exceptionally high levels of employment in agriculture along with high productivity per hectare. In this respect, the experience in India and our neighbouring countries in South East Asia is rather disappointing in that it is about 1/3 of the level achieved in countries like Japan. The most important question, therefore, is whether the methods used in these countries can be adopted in our country to raise agricultural employment and output. Prof.Shigeru ISHIKAWA has discussed this question in depth in his major contribution on the subject "Labour Absorption in Asian Agriculture". He has very convincingly proved that what is crucial is the roles played by irrigation and drainage development for effective water management, selective plant breeding, innovative cultural practices for efficient use of land and selective mechanisation for overcoming constraints on extension of multiple cropping. All these factors individually and collectively help to maintain high levels of labour absorption while raising productivity of land.

2.21 Indepth study - area specific and individual plot specific - is necessary in respect of different sources of irrigation, methods of supplying water to the fields, extent of use of cheical fertilizer as opposed to farm manures, optimum depth of ploughing and intensity of weeding etc. Region-specific studies are required also in respect of cultural practices such as preparation of seedling beds, periodical breeding and use of high yielding varieties, operations to be taken up for mechanisation, number of croppings, etc. There is also scope for creation of employment opportunities in non-agricultural operations on a wide front.

2.22 Recent research studies have shown that labour input is likely to be higher in farms that have adopted techniques which raise productivity of land and lower in farms with larger land holdings. There is no evidence to suggest that diseconomies of scale set in as the size of the farms becomes smaller. The relevance and scope for institutional and contractual infrastructural changes like radical land reform and strengthening of bargaining power, etc. become extremely important.

2.23 It is pertinent in this connection to remember that all these have to be conceived and implemented in the context of actual physical biological factors like quality of soil, climate, genetic properties of seed, moisture and the energy inputs required to make effective use of these factors for realising the potential yields. The labour input, in the long term will tend to increase the asset value of land. In many regions of the country, there is a general tendency for significant increases in the size of operational holdings while simultaneously the average cultivated area per capita has declined due to growth of population and of the labour force

in agriculture. This, in effect, means that farmers in general and tenants in particular are getting dispossessed of part or whole of their holdings. This process is accentuating the growth in the number of landless agricultural labourers dependent primarily on wage employment which is leading to a growing proletarianization of the labour force in agriculture. Sociologically in the cast hierarchy, this produces a depressing effect on real wage rates for landless agricultural labour - most of these down-trodden mass being the scheduled castes. Consequently the existing inequalities in income distribution in the agricultural sector are getting widened more and more.

2.24 Research findings of Dr.Alagh, Dr.Bhalla and Dr.Bhaduri (based on a study of 281 districts) showed that in high growth districts (5.25% per annum of average rate of growth) where the rise in yield levels was the main source of growth, the rate of increase of the labour input was nearly 2.75% per annum and productivity per worker also rose at about 21/2 per cent per annum.

2.25 In this phase of our development, therefore, the unused capacity of land is a major factor of production for increasing the absorption of the labour force through intensive agricultural development which will include multiple cropping, increasing irrigation and better water-management, crop rotation and agro-industries. It may be remembered in this connection that Japan employs 219 people for every hundred hectares of arable land while India employs only about 94 people. The arable land in India is 180 million hectares and assuming that there would not be any increase in this resources, we may have to provide employment to 122 (?) persons per hundred hectare of land to provide for an optimum

level of employment in agriculture which is not at all beyond our organisational and managerial capabilities.

2.26 In this connection, the Chinese experience on the one hand and the Japanese experience on the other may be of some value in respect of labour absorption problem in Indian agriculture. During the period 1957 to 1977 in China the labour absorption in agriculture was as high as 5 million persons while the absorptions in non-agricultural sector was only 2.8 million persons of the increase in the total labour force of 7.8 millions. During the period, the high rate of labour absorption took place under conditions where both average per worker labour productivity and labour compensation per family member of the production team did not increase significantly. At the same time, in the industrial sector, the average per worker labour productivity increased steadily while the wage level declined overtime. This shows that under the existing conditions of economic development, the persistence of the low level of per worker labour compensation in both the agricultural and industrial sector was necessary. It helped capital accumulation and technological progress in the industrial sector in per capita terms. It may also be noted that throughout this period, labour migration between the agricultural and non-agricultural sectors was strictly controlled by the government. The government's allocation of resources between agriculture and industry through 'fiscal and price policy' was biased in favour of industry. It was the practice after 1958 that even when the infrastructural projects were undertaken by the State, their labour intensive components were separated into several parts each of which was assigned to a local peoples'

commune to be undertaken by using their own labour force. The proportion of the rural labour force employed in the commune and brigade enterprises was about 10% of the total in 1978. It should also be noted that the proportion of the labour force engaged in commune and brigade enterprise was essentially made up of part-time farmers working in the fields only during busy seasons. The above facts suggest that although the percentage of total labour input in agricultural sector spent on infrastructure construction, commune and brigade enterprises and private plot production was considerable, major input was into agricultural crop production. Prof. Ishikawa has shown in his "Issue Paper" that the increase in labour input per crop per hectare of rice-land is remarkable. It was around 250 eight-hour-working days in 1930s where as the labour input was as high as 500 to 800 in 1970's. As a result of changes in the cropping systems, the labour application per hectare of cultivated land appears to have increased remarkably. This abnormal rate of absorption of labour in agriculture in China, were made possible through a bunching of technological changes which made it possible to increase the utilisation of the most scarce factor of production - cultivable land. Most of the technological changes were land-augmenting and, therefore, labour using. Capital played the role of a catalyst in this technological change. The role increasingly played by such capital in this technological change tended to bring about an increase in the per hectare cost of material inputs in the later periods. Under such conditions unless the speed of increase in per hectare output is greater than that of the

increase in costs of input per hectare, the profit margin per tonne of product will decrease, given the fixed levels of product prices as well as wages.

2.27 India has many lessons to learn from the Chinese experience:- (i) The major part of the increase in labour absorption was realised within agricultural production itself - crop in particular. (ii) labour absorption in non-agricultural activities (infrastructure construction, commune and brigade enterprises) was considerable; (iii) despite the very considerable increase in labour input per unit of cultivated land, a significant decrease in the remuneration to labour appears to have occurred; (iv) when the production teams or their members are allowed to determine both product-mix and allocation of their labour, the institutions effectively governing labour allocation is of a constrained labour market; (v) definitely, the institutional setting where the management of the problem was done is through coercion and command rather than an appeal to public-mindedness.

2.28 Historically and institutionally, the Japanese experience in the matter of labour absorption in agriculture offers another valuable lesson for India. Labour input levels recorded during this post-war period in Japan continued to be higher than those for many other Asian countries. In the early period, both the output and labour input levels increased, later, the labour input per unit of land started decreasing and yet the rate of decrease was gradual, and thus a high level of labour absorption was maintaned.

2.29 The land reform of 1946 drastically altered the distributive aspect of Japanese agriculture. Growth rates achieved were higher than those in the pre-war period and a higher level of labour input was maintained. Both land productivity and labour input per unit of land, increased simultaneously during this period which was achieved by the mobilisation of the technology and techniques available. Basic trading and research institutions in agriculture were set up as part of the regular educational system. The farmers' initiatives were respected and supported by the State. The Land Consolidation Act helped the reparcelling of fragmented farms which increased efficiency. And this legislation, updated after the war made irrigation and drainage the key components of the land improvement works to be undertaken by the State.

2.30 The education system in Japan also played a new role in apportionment and training of labour between agriculture, industry and commerce. These schools were tailored to the reality of the locality they served. The agricultural schools provided an opportunity to learn for those who could not afford to proceed with the normal course of education. Here teaching was adjusted to local conditions and the students coming out of these schools remained in farming. In many cases, the local leaders including political ones were graduates of agricultural schools. The agricultural problems at the local level could easily be channelled to the upper decision-making agents through this net-work. It was easy, therefore, for the central and provincial governments to implement their policies by taking advantage of this net-work. There is also a wide

net-work of farmers' associations which provided a forum for diffusing the new ideas in agriculture. It also became an instrument of government's agricultural policy and at the same time functioned as an agent to channel problems upwards and influence agricultural policy for its members. The above picture will explain the technological and institutional factors to which the uniformity of productivity and labour absorption can be attributed.

2.31 The post-war land reform introduced in 1946 by the American Army produced a profound and healthy impact on the agrarian structure and economy in Japan. After the reform, the number of farmers who operated less than one hectare of land was seventy four per cent of the total and the number of households which cultivated more than two hectares was about 6 per cent, as a result of the radical land reform. Thus 80 per cent of the farmers could make their farm unit economically viable only through the participation of one or two members of the household in non-form activities. Also, the increased propensity to be consumed of the new class of owner farmers and the rapid diffusion of appropriate technology and mechanisation accelerated the movements of the rural household labour into manufacturing operations of a household nature. This process has led to almost 70 per cent of the households earning more income through non-farm operations organised and managed in a highly decentralised way. The role of land reforms has been thus directly and indirectly to remove the rural-urban income disparities. The success of the Japanese agricultural experiment could be attributed to the primogeniture system of inheritance

which prevented fragmentation, promoted investment in irrigation, drainage and land improvements and above all to the instruction among all institutions related to agriculture. The radical land reform provided a solution to social disparities then existing and agriculturally non-viable households were encouraged to maximise the household income by mobilising family labour for non-farm operations.

2.32 A detailed, comparative study of the Indian experience with that of Japan and China in this respect will highlight the following features of our development in the field of agriculture.

i) While the behaviour of economic agents is seriously constrained by institutional factors and class structure, the latter are themselves constantly shaped by economic, demographic and technological factors. The economists or the politician at the helm cannot shirk the responsibility of analysing this process of shaping. Institutions like labour attachment, land relations and ownership patterns are not "frozen data" from history. It is important to understand how in the evolutionary process of history, the inherited institutional forms adapt and mutate in response to the changed circumstances.

ii) Technological yield-increasing or land-improvement factors like irrigation, fertilisation, improved varieties of seed, and double cropping are likely to increase the use of hired labour by shifting out the labour productivity function. Labour productivity shifts can be labour-using or labour-saving; eg. lift irrigation is more labour using than gravity flow irrigation. Farm-yard manure is more labour-using than chemical fertilisers. Productivity shifts

brought about by engineering innovations like tractors, transplanters or mechanical weeders and threshers, are labour-displacing.

iii) Hired labour intensity is positively associated with land quality or improvement factors like irrigation or multiple cropping and negatively with the village wage rate. It seems that larger farms have a lower seasonal variation of labour use, possibly indicating their better ability to muster resources like ground water and credit. Institutional changes like tenancy legislation or profitability of self-cultivation have caused large-scale tenant eviction which has led to a significant rise in the use of hired labour. The wage rate seems to be quite sensitive to demand and productivity factors as opposed to the notion of subsistance theory of wages or nutrition based efficiency theory of wages. In villages where the alternative of non-farm work is important, the farm wage is driven up.

iv) Piece-meal reforms may not be welfare improving for the tenant. If the contractual interlinking leads to a partial response to a whole host of incomplete and imperfect markets, piece-meal policy changes without a comprehensive understanding of underlying institutional features and their interconnections, it may even worsen the lot of the poor tenant - labour - borrower. History is littered with well intentioned but ill-conceived projects crashing down on their intented beneficiaries.

v) Large parts of India have a very substantial physical potential of surface and ground water irrigation as yet unutilised. This emphasises the need for massive investment for such a vast programme

of irrigation and drainage and the problems of mobilising resources to finance investment on such a scale.

vi) The beneficiary farmers are politically so difficult. The political power of the rich farmers and their increasing ability to resist higher irrigation and power charges and betterment levies or repayment of subsidised loans from the State, point to a constraint ultimately derived from private property rights in land.

vii) The private property rights in land and lack of community organisation have played havoc with maintenance of water distribution in many parts of India's canal irrigation system and has led to what Prof.Hart called "anarchy syndrome" in the scramble for water. Apart from illegal diversions and misappropriations of water, often by the wealthy and powerful, tail-end-farmers in general get too little water and too late.

viii) Apart from maintenance of ditches and water allocation, land preparation for irrigation is also seriously affected by private property rights. The most comprehensive and effective land shaping and levelling programme involve consolidation of land fragments and realignment of field boundaries. The land fragmentation is excessive in India and the progress of consolidation in spite of copious legislation has been very poor. In the absence of land consolidation, field channels even when constructed by Government or by the community have to take long circuitous routes leading to high costs of construction and maintenance.

ix) The prospects of substantial growth of agriculture in India, particularly if it is to spread

beyond the existing regional pockets, are crucially dependent on a controlled and vast net work of water management and distribution. The full growth potential cannot be realised even if the requisite massive investment can be mobilised, until local broad-based community organisations which can rise above or supercede the private property interests of rich landlords are developed for water resources development and management and also for land preparation, consolidation, flood control, prevention of deforestation and soil erosion.

x) The primary bottleneck here, as with many other development problems in India, is organisational and political. Seldom is the attention of even leftist political parties directed to productivity oriented local co-operative organisations. They all revel in price-tax-rent campaigns only. It is far easier to agitate against existing inequality and oppression than to build from the ground up viable community organisations and sustain them. The latter requires a completely different kind of organisational resources or political-enterpreneurial skills which the present leadership of these parties is often ill-equipped to provide. Yet the need remains desperate.

CHAPTER III

I N D U S T R Y

A programme for industrial development is implemented over the last 35 years with a view to utilising and processing the nation's resources, improving the technical and human skills, providing employment and boosting the economy. The twin objectives of the industrial policy are "removal of poverty and attainment of self reliance" which are sought to be achieved through:-

(i) ensuring minimum needs of the lowest 40 per cent of the population who are below the poverty line;

(ii) location of growth centres in which technology will have a break-through so that we may bridge the technological gap between India and the developed world, so as to be on par with them in the growth of industries and development;

(iii) resources optimisation - agricultural, mineral, forest and human - so that Indian industry is geared to development of local resources for optimum value-both social and economic; and

(iv) exporting goods and services.

3.2 The above goals of development are conceived in the context of the initial conditions limiting economic development of contemporary India which significantly differ in a number of respects from those experienced by the developed countries in their early stages of growth. Since, the initial conditions India faces today differ drastically

from those faced by developed countries in the past, it is imperative that we identify our own specific pattern of development strategies suited to our initial conditions and cultural heritage. A major initial condition which constitutes the most serious limiting factor is the lack of basic investment in agricultural land, such as flood control, irrigation and drainage, which we have examined in depth (in Chapter II). The second limiting initial condition is the existing surplus of labour combined with a high rate of population increase. Thirdly, the net resource flow between the two sectors is an inflow into the farm sector as against the commonly held proposition that the early phase of industrialisation must be financed largely from a net resource out-flow from agricultural sector. These special features are combining with the tremendous speed of technological progress and the changing structure of world trade, making it imperative for a country like India to choose a more complicated and dualistic process of growth than any other models of the past. The choice of technique and organisation, therefore, will have to be made in a much more selective and articulate way. (The choice of technique, Mahalanobis model, etc. have already been discussed in Chapter I).

3.3 The Planning Commission has projected the labour force upto 1986 and the Tata Economic and Consultancy Services has projected the same upto 2000 A.D. which is given below:

Table 3.1

Labour Force Till 2001 A.D.

Year	Total population (million)	Labour Force (million)	Participation rate
1	2	3	4
1971	548	180	32.8

Contd.....

1	2	3	4
1981	685	223	32.6
1986 (Planning Commission)	705	247.9	35.2
1986 TECS	734	251	34.2
1991 TECS	801	287	35.8
1996 TECS	873	325	37.2
2001 TECS	945	364	38.5
Total increase over 1981	260	141	...

3.4 The labour force will grow at a faster pace than the population due to changes in the age structure of population, increasing urbanisation and decreasing proportion of youngsters in the labour force. The growing population with a faster increase in the labour force, would call for a specific strategy for employment, as employment means dignity and self-respect to the people. The labour force till 2000 A.D. is already born and will be around 364 millions. Nearly 150 million new jobs will have to be created between 1986 and 2000, a challenging task for the ingenuity and earnestness of the next generation.

3.5 Availability of power is one of the crucial factors determining the pace and pattern of industrialisation. Industry uses energy as process heat, steam and motive power. Besides, industry requires some of the fuels like coal and coke for metallurgical purposes. The production of fertiliser also requires coal, naptha and fuel oil.

3.6 One of the unique features of consumption of energy in India is that almost 50 per cent of the energy requirements are met from non-commercial energy sources such as firewood, dung and vegetable waste (out of 376 million tonnes of coal replacement energy equivalent consumed in 1971, 179 million tonnes were accounted for by non-commercial sources).

3.7 The sector-wise consumption of commercial energy was as follows (1970-79).

Table 3.2

Sector-wise Consumption of Commercial Energy (in percentage)

Item	Household		Agriculture		Industries		Transport		Others	
	1970-71	1978-79	1970-71	1978-79	1970-71	1978-79	1978-71	1978-78	1970-71	1978-79
1	2	3	4	5	6	7	8	9	10	11
Coal	7.9	5.8	...	...	60.5	73.5	31.0	18.0	0.6	2.8
Oil	28.4	20.3	4.6	13.7	11.2	6.4	48.6	55.4	7.2	4.2
Electricity	7.9	9.1	9.3	14.2	70.7	63.8	2.9	3.1	9.2	9.8
Total	18.0	13.7	4.6	10.6	38.7	38.5	32.7	31.7	6.0	5.5

Source:- Planning Commission, Report of the Working Group of Energy Policy, 1979

3.8 High speed diesel, used for railways, trucks and buses, accounts for almost 40 per cent of the total oil use. Motor gasoline (petrol) used for automobiles, scooters and three-wheelers accounts for 7 per cent of the total oil demand. There is considerable uncertainty about the domestic energy requirements. The National Council of Applied Economic Research Survey (1962-63) estimated an urban limit of 0.44 tonnes of coal replacement per person per annum. The energy study states that India is well endowed with coal, and has sizeable hydel potential as well as large thorium deposits. Recent off-shore discoveries lead one to expect self-sufficiency in oil in the coming years, especially as only about 4 per cent of the potential oil bearing sedimentary area has been explored so far. Uranium and thorium (assured resources of 22,000 tonnes and estimated resources of 450,000 tonnes respectively) will meet the potential need of fast breeder reactors. The development in solar energy for a tropical country should be most promising, especially for water and space heating, air conditioning and refrigeration.

3.9 The index numbers of industrial production in factory enterprises during the period 1951-83 are presented in Table 3.3. Judged from the range and sophistication of industrial products, the progress made is much more impressive and substantial. In the First, Second and Third Five Year Plans, the targeted rate of growth of output in the large scale manufacturing sector were 7.0, 10.5 and 10.75 per cent per annum respectively.

Table

Index Numbers of Industrial

Industry/Group	Weight	1951	1960
1	2	3	4
Mining and quarrying	9.69	45	67
Food manufacturing	7.74	42	63
Beverage	0.69	33(a)	60(a)
Tobacco	2.21	33(a)	60(a)
Textiles	17.43	72	90
Footwear, other wearing apparel and made up textile goods	0.34	39	62
Wood and cork products	0.49	20	45
Paper and paper products	2.24	18	46
Leather and fur products	0.32	119	164
Rubber products	2.22	26	46
Chemical & chemical products	10.90	18	43
Petroleum and coal products	1.62	4	34
Non-metallic mineral products	3.33	20	51
Basic metal industries	8.84	22	48
Metal products	2.77	13	41
Non-electrical machinery	5.55	5	25
Electrical machinery	5.30	7	27
Transport equipment	7.39	15	75
Misc. manufacturing	1.70	14(b)	83
Electricity	9.23	11	30
All Industries: Crude Index	100.00	30	54
Of which Engineering Industries*	29.85	14	46

(a) Combined index for beverage & tobacco;
(b) Relates to 1952
*Index prepared by CMIE by combining five industry groups:- (i) Basic metal, (ii) Metal products (iii) Non-electrical machinery, (iv) Electrical machinery, and (v) Transport equipment.

3.3

Production in Factory Enterprises (Base 1970 = 100)

1970	1975	1977	1978	1979	1980	1981	1982	1983
5	6	7	8	9	10	11	12	13
100	127	140	142	148	144	170	188	208
100	107	118	138	131	128	142	169	163
100	175	347	388	279	293	397	542	569
100	96	108	113	125	122	139	153	128
100	101	103	110	110	116	117	103	113
100	91	80	73	76	70	86	77	88
100	110	131	124	123	122	87	87	177
100	110	113	121	124	131	148	152	145
100	124	104	72	74	104	94	85	82
100	123	128	143	142	150	153	164	172
100	132	172	183	187	183	207	217	223
100	119	133	141	153	137	161	175	182
100	124	147	152	158	160	169	175	184
100	115	145	145	141	133	148	158	155
100	127	137	155	163	151	150	161	163
100	153	180	202	205	218	236	239	251
100	120	146	151	163	168	180	180	184
100	112	125	125	125	130	143	142	153
100	72	100	135	121	109	99	90	79
100	138	165	184	193	197	220	236	246
100	120	138	148	150	150	165	172	180
100	123	146	153	155	156	167	177	177

It may be noted that the population grew at the rate of 2.5 per cent per annum during this period with the result that the increase in the per capita industrial output over the decade (1970-83) was only small.

But we realised only 6, 7.25 and 8 per cent per annum. The Fourth Plan aimed at a growth rate of 12 per cent per annum. The Fifth Plan fixed a lower rate of 8 per cent per annum. The Sixth Plan again fixed a lower rate of 8 per cent per annum. What is alarming is that the realised growth rates in this period were very much lower. It was only about 6.4 per cent per annum in the periods 1950 to 1960 as well as 1960-1970 (vide Table 3.4) and 4.6 per cent during 1970-83. The average rate of growth achieved during the entire planning era was only 5.6 per cent. If we take the period 1956 to 1982, the average growth rate was only 4.7 per cent per annum.

Table 3.4

Annual Rates of Growth of Industrial Production in Factory Enterprises

Industry/Group	Compound annual rate of growth between			
	1951& 1960	1960& 1970	1970& 1983	1951& 1983
1	2	3	4	5
Mining and quarrying	4.5	4.1	6.0	4.8
Food manufacturing	4.6	4.8	3.9	4.3
Beverage	6.9	5.3	14.0	8.7
Tobacco	6.9	5.3	2.9	4.6
Textiles	2.5	1.1	0.9	1.4
Footwear, other wearing apparel and made-up textile goods	5.3	4.9	(-)2.3	2.5
Wood and cork products	9.5	8.3	4.4	6.9
Paper & paper products	11.0	8.0	2.9	6.5

Contd.....

1	2	3	4	5
Leather & fur products	3.6	(-)4.5	(-)2.3	(-)1.3
Rubber products	6.6	8.0	4.3	6.1
Chemical and chemical products	10.2	8.9	6.4	7.8
Petroleum and coal products	26.8	11.4	4.7	12.2
Non-metallic mineral products	11.0	7.0	4.8	6.9
Basic metal industries	9.1	7.6	3.4	6.1
Metal products	13.6	9.3	3.8	7.8
Non-electrical machinery	19.6	14.9	7.6	12.2
Electrical machinery	16.2	14.0	4.8	9.7
Transport equipment	19.6	2.9	3.0	7.2
Misc. manufacturing	21.9	1.8	(-)2.3	5.7
Electricity	11.9	12.8	7.2	9.7
All Industries: Crude Index	6.4	6.4	4.6	5.6
Of which Engineering Industries	14.2	8.0	4.5	7.8

3.10 We may now examine the economic and industrial structure that has emerged during the last 36 years. Rising incomes invariably introduce systematic variations in the economic structure and resources get shifted according to changing patterns of demand and opportunities for trade. Hollis B.Chenery in his study "Growth and Structural Change" developed a table to measure the changes at different stages of per capita income, accumulation, output consumption, urban-rural population, sectoral labour force and trade. The Tata Economic and Consultancy Services has tried to fit this table to present day India with very interesting results (Table 3.5).

Table 3.5
Structure of Indian Economy

	1950-51	1960-61	1970-71	1980-81	1983-84
I. Accumulation					
1. Gross domestic savings as % of GDP	10.2	13.7	16.8	22.8	22.2
2. Gross domestic capital formation as % of GDP	10.0	16.9	17.8	24.4	23.7
3. Tax revenue as % of the GNP	4.4	6.5	8.8	11.5	16.6
4. School enrolment rate (age group 6 to 11)	43.1	82.4	79.1	85.2	93.3
5. Adult literacy rate	16.7	24.0	29.5	36.0	NE
II. Output Composition					
6. Primary share of NDP (%)			50.1	39.9	39.2
7. Secondary share of NDP (%) (Industry)			19.7 (13.4)	23.0 (16.7)	23.4 (14.5)
8. Transport, Communication & Trade - Share of NDP (%)			15.8	20.8	20.2
9. Finance and Real Estate - Share of NDP (%)			4.9	5.8	5.9
10. Community and personal Services - Share of NDP (%)			9.5	10.6	11.3

1	2	3	4	5	6
III. Population & Labour Force					
11. Primary labour as % of total labour force	72 1	71 8	72 1	68 8	NE
12. Industrial labour as % of total labour force	9 0	10 6	9 5	11.3	NE
13. Utilities & services labour as % of total labour force	18 9	17 6	18 4	19 9	NE
14. Urban population as % of total population	17 3	18 0	19 9	23 3	NE
15. Death rate per 1000 population	27 4	22 8	19 0	14.8	11.9
16. Birth rate per 1000 population	39 9	41 7	41.2	37 1	33 6
IV. Trade					
17. Export of goods & services as % of GNP	6 6	4 5	4.2	5 2	5.1
18. Import of goods and services as % dof GNP	7 1	8 0	4 5	9 8	8 1

NE = Not Estimated

3.11 The share of non-agricultural sector in gross domestic product (GDP) and distribution of non-agricultural labour force should, therefore, be as in Table 3.6 under the assumption of the growth of per capita GDP in the range of 1 to 3 per cent.

Table 3.6

Per capita GDP and Share of Non-agricultural GDP and Labour Force by 2000 AD

Selected annual growth rate of real per capita GDP (%)	Expected Values for 2000 AD		
	Real per capita GDP in US$ 1976 prices	Non-agricultural share of GDP (%)	Non-agricultural share of labour force (%)
1.0	179	64.5	39.8
2.0	227	69.5	46.5
3.0	287	73.7	52.3

It will be observed that these estimates have taken the primary sector's contribution at a higher percentage as compared to Chenery's table because we are laying significant emphasis on developing agriculture. Again, we would like to give prominence to basic industries and intermediate goods which may lower the contribution from industry in the early stages of growth, inspite of high investments. We are giving equal credit to services because of the policy of high priority to the betterment of the weaker sections of the people with a view to developing distribution of incomes on healthy and equal egalitarian lines.

3.12 Our policy has been to go in heavily for capital goods industry which is evident from the value added by the different branches of industry in 1983-84.

Table 3.7
Value Added by Industries

Branch of Industry	1983-84(%)
1. Consumer goods	3.02
2. Intermediate goods	3.06
3. Basic goods	5.27
4. Capital goods	5.16

There is presently a popular view which would stress on consumer goods industries on the plea that they are less capital intensive and more employment oriented. If we persist in the existing priority for heavy industries, we may have perhaps, huge investments locked up in basic goods plants which would remain idle for want of orders from other sectors of industry whilst shortages of intermediate and consumer goods will persist perpetuating an economy of shortages. But we would also not underestimate the prospects of exports of capital and durable consumer goods from India especially to Arab World, Africa and South East Asia. Defence requires a strong support from basic industries. We are in an advantageous position to export plant and equipment especially where intermediate technology is involved.But this possibility can be exploited only if we would maintain labour discipline, high productivity and high quality workmanship.

3.13 India should be able to take maximum percentage of development through research, technological advances, process developments and shifts in consumer preferences. The enormous strides we have to make in aviation, shipping, communications, plastics, pharmaceuticals, chemicals, computers, and machine tools represent potential areas for our planned growth.

3.14 The Mahalanobis strategy which India followed, stipulates: The capital-output ratio of capital goods industries is generally high so that higher investment in it tends to reduce the immediate increase in total output that results from a given total investment. Such higher investment increases the proportion of capital goods in total output and hence increases investment in the next period. This process helps to build forces of acceleration into the economy, growth becomes faster, income increases more and more and in consequence, consumption also rises steadily.

3.15 It may be noted that the ultimate higher rates of growth in the future time periods are the main justification for accepting lower rates of growth in the initial years. This can only be achieved if saving rates are made to rise at continuously higher levels.

3.16 Unless the rising rates of savings are maintained over long periods, the investment in higher capital-output ratio industries do not fructify in terms of higher income. In such a situation, the proportion of industrial output to total output will tend to rise only very slowly and, therefore, the growth of output will slow down.

3.17 The Mahalanobis model assumes supply to be equal to output and output to be equal to capacity. If savings or the demand for capital goods do not rise adequately as a proportion of income, the mere creation of capacity to produce capital goods would not produce investment. It merely produces unutilised capacity in the capital goods sector and also inflationary pressures on the prices of consumer goods. The Draft Fifth Five Year Plan states:

"If the development process is not to generate disproportionalities of various sorts, the needed changes in the structure of demand and of production must harmonise. If, for instance, the pattern of output capacity is changes in favour of investment goods but there is no corresponding change in the structure of gross national expenditure in favour of investment outlays, the economy would experience under utilisation of capacity, in the industries producing investment goods and strong inflationary pressures in respect of the consumer goods sector".

3.18 The failure of Indian planning was that such a pushing up of the rates of investment on the basis of domestic savings could be achieved because of the political and administrative factors. Thus the Mahalanobis model has failed to produce the results for wrong reasons. Under utilisation of capacity and inflationary pressures have necessarily appeared.

3.19 There is an all-round political and administrative unwillingness to recognise that if higher investment rates could in fact be achieved they could be used to produce much faster rates of growth by investment in the consumer goods industries with their much lower capital output ratios. Such a structural change could bring about a sharp increase in the proportion of the total labour force that is productively employed in industries.

3.20 This model is not a static model which freezes the options for all time. Since its theoretical base is in terms of capital goods and consumer goods in a closed economy, it does not *ipso facto* preclude that in the second or later phases of growth, it cannot function as an open economy.

Once the possibilities of trade open up - just as it has happened in the case of closed economies like U.S.S.R. and Eastern Europe - the domestic supply of capital goods can be made greater than the domestic output of capital goods through trade.

3.21 The domestic production of capital goods substitutes for imports of capital goods and thus helps foreign exchange saving in the future. In the short-run, these capital intensive industries may starve the wage-goods industries of capital and, in turn, prevent speedy expnsion of these industries. In this design of development, the maximum productivity of the scarce factor, capital, in generating income and employment should be the criterion for choice between a wide range of products. The industries chosen should be given protection only for a limited period of time until it can stand on its feet and can in fact enter export markets as well as supply the domestic market. Thus import substitution should be viewed only as the other side of the model of export expansion. In applying the principle of import substitution, we should not, therefore, ignore employment and output maximisation, creation of optimum capacity plants and capital output ratio.

3.22 In the present situation, many of the projects are uneconomic per se in terms of costs and prices and cannot be competitive in World markets. Inherently, they become high-cost industry, the costs of which are high because the levels of efficiency of production and management are low. The high costs of production in units with low capacities and low capacity utilisation ratios prove to be a heavy burden on the land-use industries which become uncompetitive in World markets.

This is a cumulative process releasing a chain of high costs and prices. The net result is a high cost and slow growing economy.

3.23 Sufficient studies have not been made in India regarding the linkages between manufacturing industries and between manufacturing sectors as a whole and other sectors. These are necessary to throw light on similarities and dissimilarities in the industrial structure at different stages of development which would eventually help to secure for us the advantages by concentrating on particular groups or clusters of industry and related industries. In this connection, we may have also to draw a distinction between technologically determined linkages and the kinds of choice that are available without given natural resources. In a recent study Dr.Alagh has summarised the process of our industrial growth. The main finding are critically examined here.

3.24 In any study of the rate of change it is well known that the periodisation of the past has an important effect. Statistically, in any growth measurement the base period should not be that of low performance. Hence cyclical effects should be removed from the time series in measuring growth. Secondly, one has to examine the basic structural factors at play and evaluate the situation correctly for using the same for periodisation. For these reasons we take 1976-77 as a cut off point. This year also represents the beginning of a high level of public investment. Prior to that, as Ahluwalia shows, the Indian economy had been started of essential infrastructure such as power, transport and irrigation. Hence it is reasonable to compare the performance in the period before and after 1976-77.

Industrial Performance

3.25 The annual rate of growth have been computed (by Alagh) for the manufacturing sector for the period 1972-73 to 1975-76, 1976-77 to 1983-84 and for the overall period are averaged 1972-73 to 1983-84. The annual growth rates for each period are averaged to compute annual average growth rate for the period. For the manufacturing sector the annual rate of growth in the earlier period was 3 per cent, for the later period it is 4.6 per cent and for the total period it is 4.1 per cent (Table 3.8).

3.26 The index of industrial production seriously under estimates the country's industrial output because its coverage is seriously limited. The Annual Survey of Industries (Census and Sample Sectors), is the basic source. The index of industrial production also does not cover the registered factory sector as a whole. Therefore, we take for our present purpose the estimates of manufacturing growth rates from National Accounts Statistics, the value of output at 1970-71 prices. The industrial output in India (ignoring the unregistered manufacturing sector) grew at the rate of 6.7 per cent per annum for the period 1976-77 onwards, and 6.3 per cent per annum for the whole period 1971-81. The growth rate achieved since 1976-77 is not very different from the targeted growth rate for the manufacturing sector in the Sixth Plan (Table 3.9).

3.27 The trends of higher growth in the later period is also shown when computed for the net value added (Table 3.10). The growth rate

Table 3.8

Average Growth Rates based on Index of Industrial Production (Base 1979 = 100)

Sl. No.	Code (Ind.)	Industry Group	Weight	1972/73 to 1975/76	1976/77 to 1983/84	1972/73 to 1983/84
1	20	Food manufacturing	7.74	2.55	5.70	4.6
2	21	Beverages	0.69	11.10	18.38	16.0
3	22	Tobacco	2.61	(-)2.25	4.85	2.5
4	23	Textiles	17.43	0.75	0.85	0.8
5	24	Footwear	0.34	(-)1.43	0.36	(-)0.2
6	25	Wood and Cork	0.49	3.60	12.48	9.5
7	27	Paper	2.24	0.43	4.09	2.9
8	29	Leather	0.32	5.05	(-)3.70	(-)0.8
9	30	Rubber	2.22	1.50	5.25	3.2
10	31	Chemical&Chemical Products	10.90	4.45	6.59	5.9
11	32	Products of Petroleum&Coal	1.62	3.23	5.94	5.0
12	33	Non-metallic Mineral Products	3.33	2.58	5.65	4.6
13	34	Basic metals	8.84	3.80	3.84	3.8
14.	35	Metal Products	2.77	0.43	3.80	2.7
15	36	Non-Electrical Machinery	5.55	8.38	6.34	7.0
16	37	Electrical Machinery	5.30	5.25	5.19	5.2
17	38	Transport Equipment	7.39	5.60	3.68	4.3
18	39	Miscellaneous Manufacturing Industries	1.70	(-)6.78	2.20	(-)0.8
19	2-3	Manufacturing Total	81.08	3.00	4.59	4.1

Table 3.9

Average Growth Rates Based on Value of Output in Registered Manufacturing Sector (at 1970/71 Prices)

(Per cent)

Sl. No.	Industry/Group	1971/72 to 1975/76	1976/77 to 1981/82	1971/72 to 1981/82
1.	Food Products	1.6	7.8	5.0
2.	Beverages, Tobacco & Tobacco Products	3.4	9.6	6.8
3.	Textiles	6.4	4.4	5.3
4.	Wood & Wood Products, Furniture & Fixtures	(-)3.3	1.4	(-)0.7
5.	Paper&Paper Products&Printing, Publishing etc.	1.6	7.4	4.8
6.	Leather&Leather Products(except repair)	(-)7.2	9.3	1.8
7.	Rubber Plastic, Petroleum&Coal Products	12.7	11.0	11.8
8.	Chemical & Chemical Products	7.7	10.1	9.0
9.	Non-metallic Mineral Products	2.9	5.2	4.2
10.	Basic Metal & Alloy Industries	5.9	8.4	7.2
11.	Metal Products & Parts	0.9	5.1	3.2
12.	Machinery, Machine Tools and Parts except Electrical Machinery	6.5	8.5	7.6
13.	Electrical Machinery, Apparatus&Appliances	7.9	10.7	9.4
14.	Transport Equipment and Parts	(-)0.3	9.1	4.8
15.	Misc. Manufacturing Industries	(-)3.3	6.7	2.2
16.	Repair Services	18.4*	5.1	8.4*
	Total	4.6	7.6	6.3

*Relates to the period from 1974/75 onwards.

Table 3.10

Average Growth Rates Based on Net Value Added in Registered Manufacturing Sector (at 1970-71 prices)

(Per cent)

Sl. No.	Industry/Group	1971-72 to 1975-76	1976-77 to 1981-82	1971-72 to 1981-82
1.	Food Products	0.79	7.75	4.59
2.	Bewerages,Tobacco & Tobacco Products	0.30	11.69	6.52
3.	Textiles	5.68	5.20	5.42
4.	Wood & Wood Products,Furniture&Fixtures	(-)4.76	(-)1.11	(-)2.77
5.	Paper&Paper Products&Printing,Publishing,etc.	1.69	2.96	2.38
6.	Leather&Leather&FurProducts(except repair)	(-)9.67	(-)19.58	1.53
7.	Rubber,Plastic,Petroleum&Coal Products	1.06	6.15	3.84
8.	Chemicals and Chemical Products (Except Petroleum & Coal)	4.97	7.57	6.39
9.	Non-Metallic Mineral Products	0.88	4.79	3.01
10.	Basic Metals & Alloy Industries	7.11	6.39	5.24
11.	Metal Products & Parts except Machinery & Transport Equipment	1.25	4.82	3.20
12.	Machinery, Machine Tools & Parts except Electrical Machinery	7.05	6.61	6.81
13.	Electrical Machinery,Apparatus&Appliances	8.54	7.71	8.09
14.	Transport Equipment and Parts	0.02	7.43	4.06
15.	Miscellaneous Manufacturing	(-)6.45	7.19	0.99
16.	Repair Services	12.25	2.32	3.49
	Value of Output	3.49	5.76	4.73

of net value added is lower than that of gross value of output (compare Table 3.9 with Table 3.10). This is probably on account of the fact that in the earlier phases of industrialisation the material intensity of production increased as the industrial economy diversified. The estimates of growth rates in the net value added in the unregistered manufacturing sector at 1970-71 prices is given in Table 3.11.

3.28 The data base is weak. The existing national accounts statistics seem to seriously under-estimate value added in some fast growing unregistered manufacturing sectors. In many fast growing sectors like rubber, plastics, electronics diamone cutting, etc., industrial output is being seriously under-estimated. Therefore, we may adopt for our evaluation purpose the same elasticity of gross output to value added in the unregistered manufacturing sector as in the registered manufacturing sector. The growth rate of unregistered manufacturing sector would be 5.2 per cent in the later period and around 5.5 per cent for the period 1971-81.

3.29 Industrial economy is now showing a greater impact of structural change as compared to earlier periods. The set of industrial policies followed since 1980-81 is leading to faster processes of adjustment in the Indian industrial economy. This is a feature which has to be at the centre of the policies of productivity and technical change in the sense that changes already under way have to be accelerated.

3.30 While the share of output to the agricultural sector fell from 59 to 46 per cent in the period 1950-51 to 1970-71, the sectoral compositions of the labour force did not change. But the results of the 1981 census has changed all these. As

Table 3.11

Average Growth Rates based on Net Value Added in Unregistered Manufacturing Sector (at 1970-71 prices)

(Per cent)

Sl. No.	Industry Group	1971-72 to 1975-76	1976-77 to 1981-82	1971-72 to 1981-82
1.	Food Products	3.9	3.2	3.5
2.	Beverages, Tobacco & Tobacco Products	6.8	3.8	5.1
3.	Textiles	5.9	5.1	5.5
4.	Wood & Wood Products, Furniture & Fixtures	5.0	(-)3.8	0.2
5.	Paper & Paper Products & Printing, Publishing & Allied Industries	1.0	14.6	8.6
6.	Leather & Leather & Fur Products (except repair)	1.5	1.3	1.4
7.	Rubber, Plastic, Petroleum & Coal Products	7.8	4.9	6.2
8.	Chemicals and Chemical Products (except petroleum and coal)	5.5	7.8	6.8
9.	Non-Metallic Mineral Products	7.5	5.2	6.3
10.	Basic Metal & Alloy Industries	5.8	3.4	4.5
11.	Metal Products & Parts except Machinery and Transport Equipment	3.5	2.8	3.1
12.	Machinery, Machine Tools and Parts except Electrical Machinery	5.0	6.8	6.0
13.	Electrical Machinery, Apparatus&Appliances	3.6	7.4	5.7
14.	Transport Equipment and Parts	4.4	4.6	4.5
15.	Misc. Manufacturing Industries	0.4	5.7	3.3
16.	Repair Services	3.9	5.9	5.0
	Total Value Added	4.4	4.0	4.2

shown in a recent study by Sheela Bhalla "On the employment front the most exciting thing that has happened in India in the past 50 years is the 3.9% fall in the share of main agricultural workers in the total male workers recorded by 1981 census ..... Now 3.9% does not look like a very big shift in percentage terms, but in India it represents an awful lot of people - roughly 68 lakh male workers. More important, for the same of the people who remain in agriculture and for the economy as a whole, this shift, which at long last brings the direction of the trend in the employment structure into line with that of the output structures may have many positive implications" (Table 3.12).

Table 3.12

Agricultural and Non-agricultural Male Workers

Sl. No.	State	Change in Share of Male Non-agricultural Workers in All Male Workers 1971-81	Non-agricultural Male Workers and Agricultural Workers: Growth Differential 1971-81	Factory Employment as % of Total Employment		
				1961	1971	1981
(1)		(2)	(3)	(4)	(5)	(6)
1.	Andhra Pradesh	1.79$	0.76	1.2	1.5	2.3
2.	Bihar	3.24	2.16	1.0	1.6	1.8
3.	Gujarat	5.58	2.56	4.3	5.3	5.8
4.	Haryana	4.92	2.43	NA	3.5	4.5
5.	Karnataka	3.29	1.53	1.6	2.8	3.6
6.	Kerala	7.72	2.18	3.1	3.4	4.4
7.	Madhya Pradesh	3.41$	2.35	1.0	1.5	1.7
8.	Maharashtra	5.54	2.27	4.4	5.7	4.9

Contd.....

(1)	(2)	(3)	(4)	(5)	(6)
9. Orissa	4.07$	2.32	0.5	1.0	1.0
10. Punjab	3.26*	1.94	1.9	3.0	3.9
11. Rajasthan	5.28*	2.98	0.6	1.1	1.8
12.Tamil Nadu	3.52	1.52	2.3	3.1	3.3
13. Uttar Pradesh	2.60	1.41	1.2	1.5	1.7
14. West Bengal	2.87	1.45	6.4	6.8	5.7

$States in which change in 61/71 was 60% and above with opposite sign.

*States in which change in 61/71 was greater with opposite sign.

Source:- Op.Cit. Sheela Bhalla for (2); Census Papers for (3); and Rakesh Mohan, The Regional Pattern of Urbanisation & Economic Development in India. Mimeo, Planning Commission, 1983, for Columns (4), (5), (6) Subsequently published in Economic and Political Weekly.

3.31 In Gujarat, Maharashtra and Haryana, the rise in the share of non-agricultural workers (between 4.92 to 5.58 per cent) was much higher than the national average of 3.9 per cent whereas the fall is low (between 1.79 per cent and 2.87 per cent in Andhra Pradesh, U.P , and West Bengal). Also it may be seen that in areas where structural changes in labour force are noted, the per capita value added in the factory sector is much higher than the national average in 1980-81 (in Gujarat and Maharashtra 2 to 21/2 times higher (Table 3.13).

3.32 These States have a much higher level of per capita power consumption than the national average - between 149-230 kwhs/caput as compared to less than 100 kwhs/caput in many other States.

Table 3.13

Industrial & Power Development : Growth & Levels

Sl. No.	State	Level of Gross Value Added in Factory Sector (Rs. Per Capita)			Growth of Gross Value Added in Registered Sector (Compound annual in 1971 prices) 65/77	Power Consumption Per Capita 1981 (in Kwh)		
		1961	1971	1981		1961	1971	1981
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Andhra Pradesh	9	29	74	8.51	20	56	93
2.	Bihar	14	31	57	2.80	23	65	87
3.	Gujarat	52	108	245	5.71	55	138	231
4.	Haryana	NA	70	169	10.01*	NA	98	211
5.	Karnataka	14	62	177	6.24	41	104	149
6.	Kerala	17	42	93	6.68	36	76	97
7.	Madhya Pradesh	8	27	68	11.16	16	54	96
8.	Maharashtra	69	67	324	5.02	78	158	230
9.	Orissa	6	27	62	1.92	32	96	115
10.	Punjab	4	52	136	10.01*	70	159	303
11.	Rajasthan	5	26	56	11.03	3	50	93
12.	Tamil Nadu	24	75	166	6.16	58	130	184
13.	Uttar Pradesh	9	24	47	7.34	14	60	88
14.	West Bengal	60	97	173	1.15	75	118	118

*Refers to Punjab and Haryana

Source:- For Col.(2), (3), (4), (6), (7), (8), Rakesh Mohan, Planning Commission.
For Col.(5), Alagh Kashyap, Awasthi.

3.33 It may be noted that rapid industrialisation after it crosses a particular level in relation to the population base of the regional economy, continues to grow fast and bring about associated changes in the tertiary and service sectors.

3.34 The basic structural changes related with rapid industrialisation in these high growth regions have to be linked up with conscious policies of enhancing factor productivity. Thus productivity improvements are required to sustain industrial growth through externalities of cost reduction and returns on investment for replacement of obselete equipment by new and better machines.

3.35 Isher Ahluwalia, in her recent study, "Industrial Growth in India", has looked at this problem more squarely and in depth. The picture as she has drawn up does not add upto much of an inherent strength of the Indian Industrial Structure.

3.36 In any serious attempt to analyse the pattern of growth, one always faces serious problems due to a weak data base in documenting the growth process. Ahluwalia has studied in depth the quantitative dimensions of this root problem over time as well as across industries. The emerging picture is that of a marked slow down in the growth of heavy industry combined with a continuing slow growth of consumer goods industries. The por performance is largely associated with the productivity performance in the industrial sector.

3.37 During the earlier period, heavy industries experienced rapid growth keeping the strategy of ambitious development of heavy industries and import substitution. By contrast the subsequent

Table 3.14

Specialisation Co-efficients of the Regions of India

Sl. No.	Regions	Specialisation Co-efficient 1960	1965	1978
1		2	3	4
1.	Maharashtra	0.281	0.298	0.286
2.	Maharashtra and Pondicheri	0.405	0.303	0.286
3.	Mysore and Goa	0.371	0.305	0.299
4.	Uttar Pradesh	0.393	0.363	0.374
5.	Madhya Pradesh	0.432	0.381	0.382
6.	Punjab, Haryana & Himachal Pradesh	0.490	0.399	0.379
7.	West Bengal & Andaman Nicobar	0.446	0.401	0.434
8.	Delhi	0.475	0.400	0.440
9.	Rajasthan	0.488	0.410	0.415
10.	Gujarat	0.494	0.475	0.396
11.	Andhra Pradesh	0.564	0.519	0.456
12.	Bihar	0.610	0.546	0.520
13.	Orissa	0.571	0.601	0.566
14.	Kerala	0.638	0.658	0.566
15.	Assam & Tripura	0.847	0.745	0.715
16.	Jammu & Kashmir	0.889	0.759	0.753

Computed from ASI Data for the Factory Sector

period has changed the course of industrialisation. Successive droughts, Indo-Pakistan war and the decline in foreign aid contributed to the resource crunch. This, perhaps, contributed to the neglect of consumer goods industries, under-utilisation of the capacity of heavy industries, mounting losses of the public sector and slow growth of public savings (Table 3.15).

Table 3.15

Changes in the Shares of Major Industry Groups in the Industrial Sector: Use-based and Input-based Classification (1960-61 to 1979-80)

(Per cent)

1	1960-1 2	1965-6 3	1970-1 4	1975-6 5	1979-80 6
A. Use-based classification					
Total	100.00	100.00	100.00	100.00	100.00
1. Basic goods	27.49	30.58	30.73	31.89	30.76
2. Intermediate goods	21.04	19.09	19.01	17.48	16.25
3. Capital goods	10.72	14.96	15.19	16.31	17.72
4. Consumer goods	40.75	35.37	35.07	34.32	35.27
a) Durables	2.50	2.79	3.71	4.66	4.90
b) Non-durables	38.25	32.58	31.36	29.66	30.37
B. Input-based classification					
1. Agro-based	43.68	36.35	33.65	31.03	33.65
2. Metal-based	15.76	20.69	21.26	22.13	21.26
3. Chemical-based	8.84	8.91	12.40	11.90	12.40

Notes:- The Input-based classification is not exhaustive for the industrial sector. The figures relate to the share of each group in the net value added for the industrial sector.

Source: ASI, NSS, Chandhok, WPI.

Constraints to Industrial Growth

i) Agriculture

3.38 An examination of the performance on the agricultural front would show that it did constitute the main constraint on industrial growth through its role (i) as supplier of wage goods; (ii) provider of raw materials; and (iii) generator of agricultural incomes which creates final demand for outputs of the industrial sector as well as surpluses for industrial investment.

ii) Income Distribution

3.39 The pattern of income distribution in an economy would determine the pattern of its industrial growth. This constraint operated through (i) those relating to the pattern of demand and (ii) those relating to the level of demand and therefore, of savings. Asok Mitra had shown that there was some erosion, over time, of the level of real income of the majority of population leading to a levelling off of the demand for mass consumption goods. And, on the other hand, a number of luxury consumer goods industries have sprung up to satisfy the relatively sophisticated requirements of the rich minority. Therefore, only a broad based demand for mass consumption goods can lead to a full utilisation of capacity in the intermediate and capital goods sector. As Sukhamoy Chakravarthy has pointed out, there ws worsening of income distribution over time and also a slowing down of public investment along with constraints on the expansion of public investment. This has happened largely through the relative price rise of foodgrains in terms of manufactures over time. This increase was brought about by an artificial

raising of the procurement price of foodgrains.. The increase in the price of foodgrains mostly benefited the rich farmers and the resulting increase in agricultural incomes took the form of increased savings. Investment in the rural sector fell far short of savings and with insufficient offset from other quarters, there was general deficiency of demand in the economy.

iii) Infrastructure Constraint

3.40 Public investment in the Indian economy constitutes 40 to 50 per cent of the total investment. Public sector investment contributes towards building capacities to remove certain critical infrastructure bottlenecks to growth. Since public investment forms a substantial share of the total gross capital formation in the economy, it is an important source of demand for capital goods and basic goods. A slow down in the public investment in the mid-sixties brought about "a disproportionality crisis" in that the demand for capital goods did not rise at the rates required by the Plans. An expansion in the public investment, therefore, would have brought about growth through the utilisation of existing capacities. The poor management of the existing infrastructure in power, coal and railways worsened the situation further. During this period it is seen that growth in the private investment also slowed down.Available evidence shows that the growth of overall investment in the economy declined from 8 per cent per annum during 1959-60 to 1965-66 to 5.5 per cent per annum during 1967-68 to 1979-80.

3.41 Public investment in the railways and the transport sector in general showed a declining

trend in spite of the significant role of the railways in the movement of bulk commodities such as coal and steel overlong distances. Under-investment in railways created serious bottlenecks for industrial growth. Growth of real investment in electricity suffered a slow down in the decade following the Sixties which affected development of regionally integrated transmission and distribution system. The effects of under-investment have been compounded by slippages in project implementation. This situation got itself infinitely worsened through growing inefficiencies which covered the entire spectrum, from project formulation to project implementation and finally to operational stages leading to time over-runs and cost over-runs.

iv) Finance

3.42 There were several strains on the resources side due to severe agricultural droughts in succession combined with Indo-Pakistan war and a significant decline in foreign aid. The foreign aid was as a proportion of G.D.P. reached its peak at 3 per cent in 1966-67, which declined consistently to as low as 0.5 per cent in 1972-73 (Table 3.16).

3.43 In the sixties we had diversified the industrial base in the public sector which could have generated a growing volume of public savings to meet the challenge of the development programmes in the phase of declining foreign aid. However, the growth of the public savings consistently fell short of the growing demands of the public sector. Far from contributing to development through their surpluses, the public sector enterprises, with their mounting losses, became a burden on

Table 3.16

Public Sector GDP; Public Investment & Some Elements of Financing - as % GDP (1959-60 to 1980-81)

Years	Public G.D.P.	Public Investment	Public Saving	Foreign Aid	Total Borrowing
1959-60	...	6.4	1.7	1.3	3.9
1960-61	10.9	7.6	2.8	2.4	3.1
1961-62	11.6	7.2	3.1	1.6	3.7
1962-63	12.6	8.5	3.3	2.2	3.6
1963-64	12.7	8.5	3.6	2.6	3.6
1964-65	12.2	8.4	3.5	2.7	3.6
1965-66	13.4	9.2	3.4	2.7	4.6
1966-67	13.1	7.7	2.4	3.0	4.2
1967-68	12.7	7.2	2.1	2.8	3.8
1968-69	14.0	6.5	2.6	1.8	4.2
1969-70	14.4	6.1	2.8	1.4	3.4
1970-71	14.9	6.9	3.1	1.1	4.4
1971-72	15.6	7.3	2.9	0.9	5.2
1972-73	15.7	7.5	2.8	0.5	6.0
1973-74	14.8	8.2	3.1	0.7	4.7
1974-75	16.2	8.1	3.8	1.1	4.6
1975-76	18.4	10.4	4.5	1.8	4.2
1976-77	20.1	10.6	5.1	1.3	5.0
1977-78	19.4	8.3	4.5	0.7	5.9
1978-79	20.1	9.9	4.7	0.5	6.8
1979-80	21.1	11.0	4.5	0.7	7.2
1980-81	17.6	10.6	3.5	0.8	8.3
1959-60 to 1965-66	12.2	8.0	3.1	2.2	3.7
1966-67 to 1979-80	16.5	8.3	3.5	1.3	5.0

Source: FIN.

the economy's limited resources. Resource constraints coupled with a conservative attitude towards deficit financing, contributed to a major slow in the public investment.

v) Capacity Utilisation

3.44 Another constraint was that between 1960-61 and 1966-70, there occurred maximum decline in capacity utilisation in capital goods industries and other industry groups (Table 3.17).

Table 3.17
Capacity Utilisation Ratios (1960 to 1980)

(Per cent)

Industry Group	1960-65	1966-70	1971-75	1976	1977	1978	1979	1980
Basic goods	86.0	82.0	77.4	84.8	88.3	83.8	79.3	77.2
Capital goods	85.9	66.4	60.2	59.4	67.3	65.3	64.9	62.4
Intermediate goods	89.3	81.9	79.7	79.6	83.0	81.4	82.0	82.5
Consumer goods	86.6	82.2	80.1	80.9	81.8	83.3	80.2	80.1

Source: RBI, and estimates.

The manner in which the product-mix and the capabilities of these units were built up reflected (i) little concern for forecasting market demands or creating demands to match the utilisation of capabilities, (ii) little attention to aspects of design specifications. The capacities that have been set up in most of the capital goods industries were not optimally balanced with the evolving structure of demand.

vi) Import Substitution

3.45 India has been following import substitution oriented policies for industrial development. Two basic arguments have been advanced in favour of an import substitution strategy. On the lines advocated by Raul Prebisch (Latin America), India followed a path of import substitution, carried more and more backwards in terms of stages of production. The argument that import substitution protected infant industries provided a rationale for accepting a degree of additional short-run cost in return for the future benefits of establishing a dynamic industrial set up in view of the large domestic market. This was achieved through very high tariff rates or quota restrictions which shielded them from competition through imports. This only helped to diverse market-determined investment decisions on the basis of international opportunity costs. In many cases the size of the domestic market was not large enough to exploit the economies of scale. Under the cover of protection, not only infant industries but also very old and obsolete units were protected from competition. The result was that the development of a high cost industrial structure which could not operate except in a sheltered domestic market. The exports, on the other hand, did not receive comparable protection. India's share in the world trade declined at a time when developing countries as a group were actually able to increase their share. The pattern of declining shares was equally evident in traditional and non-traditional exports. In short, there is a case for exploiting fully our foreign trade opportunities in a context where the need to earn foreign exchange to meet the basic import demands of the economy is paramount.

vii) Productivity and Growth

3.46 It appears that performance in terms of the growth of total factor productivity was poor from the very beginning. Following the approach developed by Solow (1957), productivity is measured as a difference between the rate of growth of the value added and the rate of growth of total factor input. The available estimates suggest that the efficiency in factor use declined over the last 20 years. For the manufacturing sector as a whole the estimate of total factor productivity growth yielded by the different measures ranged from (-)0.2 per cent per annum to (-)1.3 per cent per annum (Table 3.18). It is worth noting that the efficiency in factor use in the intermediate goods industries declined at the rate of about 1.5 per cent per annum for the last 20 years period. During this period, we find that total factor productivity increased at the rate of 5.7 per cent per annum in Korea and 3.1 per cent per annum in Japan.

Table 3.18

Total Factor Productivity Growth Estimates: Two Digit Industry Groups (1959-60 to 1979-80)

(Per cent per annum)

Code	Industry Group	Solow	Trans-log	Trans-log (a)	Trans-log (b)
	(0)	(1)	(2)	(3)	(4)
20	Food, except Beverages	-2.7	-3.6	-3.3	-2.6
21	Beverages	-1.4	-3.1	-2.6	-2.0
22	Tobacco	-1.4	-3.6	1.0	-2.6

Contd.....

	(0)	(1)	(2)	(3)	(4)
23	Textiles	1.1	1.0	1.1	-0.1
24	Footwear, etc.	3.0	0.7	-3.1	1.3
25	Wood and Cork	-2.7	-3.0	-2.4	-2.2
26	Furniture & Fixtures	2.2	2.1	2.3	2.8
27	Paper & Paper Products	0.5	0.1	0.5	1.2
28	Printing & Publishing	0.8	0.5	0.7	1.1
29	Leather & Fur Products	-1.9	-2.4	-1.9	-1.6
30	Rubber Products	-6.7	-5.5	-5.0	-3.6
31	Chemical & Chemical Products	-1.3	-1.3	-0.7	0.4
32	Petroleum Products	-5.4	-5.6	-3.4	-4.3
33	Non-metalic Mineral Products	-1.1	-1.2	-0.9	-0.3
34	Basic Metals	-0.1	-0.9	-0.6	.....
35	Metal Products	-2.5	-2.2	-2.0	-1.4
36	Non-ele. Machinery	-1.6	-1.1	-0.8	-0.4
37	Electrical Machinery	-0.5	-0.2	0.1	0.3
38	Transport Equipments	...	0.1	0.4	0.7
39	Miscellaneous	-6.5	-5.1	-3.5	-3.9
Manufacturing Total		-0.6	-0.4	-0.2	-1.3

Note:- Cols.(1) & (2) are based on a capital stock series constructed by using an initial capital stock at replacement cost at 1970-71 prices for 1970-61 perpetual inventory accomulation method, deflating the investment figures by the WPI of machinery and equipment. Col.(3) is based on a similar capital stock series,except that the deflator for investment is a combination of (i) domestic and imported prices of machinery & equipment,and (ii) price of construction. Finally, Col.(4) is based on a capital stock which is derived as in (3) but it also assumes that 2 per cent of preceding year's capital stock is written off every year.

Source:- NA, ASI, NSS, Chandhok, WPI.

3.47 Analysis of efficiency in factor use in developing economies is made on the basis of capital output ratios, since capital is the most scarce factor of production in these economies. Capital-output ratio is defined as the ratio of the gross capital stock at constant prices to the following years' gross value added at constant prices. We find that a major part of the increase in capital-output ratio in manufacturing was due to the rising capital-output ratio across the board. In short, the Indian industries' declining productivity performance stands in sharp contrast to that of the other economies and our industrial stagnation to a great extent, reflects the cumulative impact of the growing inefficiencies in factor use over time. The new industrial policy should aim at bringing about the environment which foster domestic competition and cost and quality consciousness.

3.48 The pattern of behaviour of the different sectors of industry during the two periods 1961-72 and 1973-81) was different from each other as well as from the overall rate of growth of industrial production. This can be seen from Table 3.19. The capital goods industries registered some growth, whereas the trend of growth of basic industries, intermediate goods and consumer goods registered a fall from 1961-72 period to 1973-81. The growth of intermediate goods industries and consumer goods industries has decelerated more than the other two. Eventhough the degree of deceleration has varied between sectors, the capital goods industries has maintained a slightly increased growth rate while the basic goods industries has registered a significant fall in the growth rate.

Table 3.19
Annual Compound Rates of Growth of Index of Industrial Production 1961-72 & 1973-81

Industry	1961-72	1973-81
1. Basic Industries	6.72	5.27
2. Capital Goods Industries	4.76	5.16
3. Intermediate Goods Industries	3.86	3.06
4. Consumer Goods Industries	4.07	3.02
All Industries	4.88	4.19

3.49 The Mahalanobis model assigned investment priority for capital goods sector on the ground that "As the capacity to manufacture both heavy and light machinery and other capital goods increases, the capacity to invest (by using home produced goods) would also increase steadily and India would become more and more independent of the import of foreign machinery and capital goods". Though not explicitly stated, this model assumed the imperativeness of keeping prices of machines low with the implicit suggestion of cost reduction through the use of automation and applied electronics. The industry will become thus more efficient in producing given machines and the benefits will be passed on to the industries using these machines. Hence there would be lowering of prices of these machines which will lead to an improvement in the marginal efficiency of capital goods which, in turn, will produce technological innovations in the economy as a whole. The link of efficiency in domestic capital goods production with technical changes and innovations can thus be established. It also serves as an instrument for making appropriate choices, generation and diffusion of technological innovations throughout the economy.

3.50 A well organised capital goods industry, as Rosenburg argues, should have a highly developed facility in the designing and production of specialised machinery which constitute an external economy of enormous importance to other sectors of the economy. A high degree of specialisation is conducive not only to an effective learning process but also to an effective application dof what is learnt. An improvement in the efficiency of capital goods production is a major source of capital saving innovations which is particularly relevant to a developing economy like that of India. But an optimum degree of specialisation of firms will be handicapped by the limited size of the domestic market and the absence of competition to act as spur to innovation and change. This range of problems are generally ignored in the economic analysis of the Indian capital goods industry.

Growth Trends in Capital Goods Output

3.51 Over time, there has been a moderate increase in the relative share of the industry related sector in G.D.P. along with remarkable shifts within the industrial sector in favour of capital goods - basic and intermediate. The degree of import substitution in these sectors has progressed considerably and has made a "dependent" economy more "self-reliant". The export sector got itself diversified and buoyant reflecting our newly built up technological capacity. Though industrial growth rate in India during 1960-1983 has been slow, (growth rate was 4.4 per cent per annum in the seventies as against 5.4 per cent in the sixties), an inter-country comparison with China, Brazil and South Korea in the Third World will help to evaluate our performance in the proper perspective. With the exception of South Korea

which made rapid strides in its export performance, India did well compared to all the others. The share of capital goods in the total manufactured exports of India has been continuously on the increase. The share on the average, moved up by 2.8 per cent in the Sixties and to 10.7 per cent in the Seventies. With the recent policy shifts tending towards liberalisation and expot promotion, the share of capital goods is poised to increase faster. While Indian capital goods industry is the second largest (after China) in terms of number of persons employed among the countries of the Third World, its relative position in terms of value-added is rather low. Productivity measured by value-added or contribution per employee in India is much less than in South Korea or Brazil - which is disturbing in the extreme for future growth. However, the degree of product diversification and technological sophistication of production of machine tools as well as other branches of machine building can be regarded as a sign of our increasing technological maturity, eventhough, there are no signs yet to indicate a high degree of operative efficiency and low prices (relative) of machines leading to capital saving innovations and technological changes in the entire economy. This calls for more and healthy competition and sub contracting arrangements in the organisation of production.

3.52 The desire for realising quick profits from a potential domestic market instead of achieving product specialisation on a selective basis led to more and more the dependence of our industry on imported technology. More than 50 per cent of the foreign collaboration agreements approved by the Government of India in the Seventies related to capital goods industry, whereas its share in total manufacturing output was less than 20 per cent.

The degree of technological dependence of the Indian capital goods industry evidently continued to remain high in spite of remarkable progress achieved by self-reliance in domestic production. This combined with resistence of Multi National Corporations to part with latest technology, is adversely affecting the dynamism of this industrial sector. It seems that the process of assimilation, adaptation and upgradation of the imported technology is rather slow in achieving the desired goals. A recent study has shown that out of 64 products added by the firms between 1975-80, 40 came though foreign licensing, 6 by outright import of basic designs and only 18 by internal generation of design. Indian producers do not seem to develop capabilities in design concepts and practices which involve large R&D investments and which may even prove costly in terms of foregone production during the period of learning and doing it by themselves. Instead, import of readily available processes in ready-to-use form saves them time and it is commercially more useful in the protected market in the short run. These firms thus pay scant attention to R&D investments or to other linkages in the innovation chain provided by R&D institutions in the public sector. The dampening effects of our fragmented organisational infrastructure and its short-comings constitute the main bottlenecks in the processof quickening technological changes and innovations. In an environment of prolonged protection Indian producers tend to follow a strategy of rapid product diversification under foreign licensing to maximise short-term profits. In order to put the industry back on the dynamic and self-reliant technological path with specialisation and improved efficiency, a reappraisal of the present policy and practice is called for. Since R&D efforts require huge

investments and the returns are distributed over a period of time favourable industrial climate and sufficient incentives are necessary to encourage it.

3.53 There is also anargument among economists that Indian economy between 1950-51 to 1973-74 has been registering a trend growth rate of 3.5 per cent of the aggregate real G.D.P. and less than 1.5 per cent growth rate of per capita G.D.P. whereas in the decade from 1973-74 the economy has registered a significant step up of its growth rate to nearly 5 per cent per annum and per capita G.D.P. at 3 per cent per annum in a sustained manner. In comparing these two time points there are the periodisation problems which pose questions of statistical validity. We have only two data points relating to the period of claimed acceleration - 1973-74 to 1983-84. And there is no special reason which will distinguish 1973-74 and a year of departure either. In the circumstances, a statistically significant and sound method is to calculate a trend growth rate using a semi-log linear trend equation. The results of this exercise are presented in Table 3.20.

3.54 What emerges from this exercise is revealing. There is only a slight increase in the growth rate of the primary sector (0.11 percentage points); there is a decline by 0.67 percentage points in the growth rate of the secondary sector and a high 1.25 percentage point acceleration in the tertiary services. It is clear, therefore, the source of whatever acceleration made, is largely confined to the tertiary sector. In a low per capita income country like India, it is disturbing to find that the tertiary sector dominates the economy. Within the tertiary sector it is the income originating in public administration and

Table 3.20
Trend Growth Rates of GDP

Sl. No.	Period	Trend Growth Rates (% P.A.) of GDP originating in				
		Primary sector	Secondary sector	Tertiary sector	Total GDP	Per Capita GDP
1.	1950-51 to 1973-74	2.13	5.82	4.70	3.53	1.43
2.	1973-74 to 1983-84	2.24	4.15	5.95	3.97	1.74
3.	1961-62 to 1973-74	2.24	4.25	4.26	3.27	1.05
4.	1950-51 to 1983-84	2.18	5.06	4.81	3.55	1.38

Note:- All the GDP estimates are at 1970-71 prices.
Source:- K.Sundaram & S.D. Tendulkar - Growth, Trickle down Effects and poverty.

defence services which has been rising faster. This has to be evaluated in the context of the lack of any acceleration in commodity producing primary and secondary sectors.

3.55 Our economic growth will be conditioned for long also by the way in which social and economic life is organised and the purposes to which it is oriented. We should avoid proliferating the kinds of industry that are dependent on demands created in highly developed western countries. Many of such types of demand have been proved wasteful. One such example is the case of conspicuous housing and building construction where the input proportion of steel and cement can be minimised with a wide range of changes in design and specifications. There is considerable scope for avoidance of waste in the choice of materials

and the proportion in which they are used. This implies that the choice of technology is not, in fact, very restricted. Technology thus offers a wide range of choice in terms of product-mix of final demand or the input-mix. The ability to change tastes and preference is so large that development and differentiation of product tend to proceed in favour of higher income groups. In societies like ours where there are extreme inequalities of income there are forces at work to promote patterns of industrial development oriented to the needs and preferences of the higher income groups. In such a situation economies of scale are not always determined by the adoption of relevant technology but often by the market advantages which can be secured by those who have command over financial resources. This means the linkages of industrialisation of developing societies are determined by the economic and social systems in which they operate. The investment and production decisions are not often taken on the basis of shadow pricing and social cost-benefit analysis. The result is that the expected linkages did not materialise and the results achieved are often different from those intended. The development of basic goods industries has not made much progress in India after the initial spurt during 1956-65. Household enterprises have not been able to produce essential consumer goods rapidly enough and factory production in consumer goods industries has been rising faster in the case of non-essential and luxury goods. At the same time a significant part of the output of the capital goods and other high priority industries has been getting absorbed by the expansion of industries catering to the requirements of the high income groups. The inevitable result of such an emerging situation is that the State is forced to undertake certain types

of complementary investment and actively foster a pattern of income distribution and demand that would be favourable to the Multi National Corporations interested in expanding highly differentiated consumer goods of the advanced countries.

3.56 This process will inevitably take us to undue dependence on Multi National Corporations and their controlled markets. The technology transferred through Multi Nationals need not always be in the interest of the receiving country in that it is usually tied to a certain kind of product-mix which promotes development in directions harmful to our growth. These Multi Nationals are guided more by their search for low-wage-labour in decisions to investment abroad than the genuine interest of the receiving countries. In fact some of the Multinationals even resorted to manufacturing and distributing such chemicals and drugs in developing countries which were banned by law in developed countries due to their harmful effects. The subsidiaries to M.N.Cs. are often confined to technology-intensive and patent-protected items which have a high degree of seller-concentration and monopolistic features. The experience of other developing countries in the past, therefore, provides sufficient warnings for our country regarding the role of the Multi Nationals in the design of an industrialisation programme that can make our country self-reliant and strong.

CHAPTER IV

PRODUCTIVITY AND UNUSED CAPACITY

We are not a Nation particularly productivity conscious and therefore, there is need for a scientific appraisal of our industrial inputs and outputs in both physical and financial terms. Without such a micro-macro input-output analysis, it will be difficult to eliminate material poverty caused by prolonged and wasteful application of scarce resources. Right allocation of resources and their productive utilisation are not automatically achieved in under-developed societies - like ours.

4.2 Productivity refers to the production - rate of a given output per unit of the relative input (or inputs) under given conditions and time. The concept of productivity centres generally around production and measurement of the relative output per unit for a given input that may fall within the categories like (i) man-hours (or labour) (ii) fixed assets; (iii) other investments; (iv) materials; (v) horse-power and (vi) managerial efforts. It should be noted that the productivity of any of these inputs improves when the output per unit of that input increases quantitatively or qualitatively a productivity conscious production unit should try to improve or increase the contribution of the production factors so as to make its overall result (interms of net values added) much more than the aggregate costs occurred in employing them. It may as well be noted that the associated inputs do not necessarily register simultaneous increases in efficiency and productivity, sinced the concerns and responses of the suppliers and users show marked variations in their multiplicity of relationships. Since conflicting interest groups of employers, workers, consumers and the State view this differently, a single clear cut concept

of productivity varies according to whether gross (or net) specific productivity or overall or integral productivity at the plant level or for a given industry or for the entire national economy is being studied or measures.

4.3 Since productivity as output input ratio, is the most important determinant of the national product uses of detailed study aiming at accurate measurement of productivity are essential in order to determine or forecast national income and output levels, employment trends, occupational shifts, resource requirements and wage-profit-price adjustments. The national income analysis is being increasingly applied to the shaping of fiscal policies and economic plans.

4.4 Production measurements cannot be made as long as production units do not prepare standardised cost-accounts. Cost accounting on a wide-scale viz., determination by the firms of 'Standard Costs', will enable productivity-measurements. We may also note that "productivity" and "efficiency" are not identical variables. Efficiency connotes the competence or capacity of a given input or production unit to produce under given conditions the result intended. "Productivity" refers to the actual results produced by an input or production line under given conditions within a given time at given costs. The efficiency of an input may increase without any simultaneous improvement in this productivity, labour productivity increases do not necessarily reveal changes in the intrinsic efficiency of labour but rather the changing effectiveness with which labour is utilised in conjunction with other factors. The productivity of labour is, in fact, an out-come of the cumulative operation of a large number

of separate, though inter-related factors like factor proportions, the utilisation rate of the production capacity, the attitude of labour, etc.

4.5 The measurement of labour productivity is relevant to the study of employment-cum-income trends, production costs and its key role in assuring the society maximum possible material welfare. Manhours required per unit of output would reflect the relative labour effort more clearly than output per man-hour. This would call for a study of all factors that influence labour productivity per man-hour. Thus it becomes necessary to construct productivity indices for every group of industry to avoid pitfalls introduced by heterogeneity of the outputs etc. In spite of all conceptual difficulties and problems, the input-output analysis will give us a fair insight into our industrial structures and costs.

4.6 Such studies may be made (i) to measure and compare periodically the productivities of specified inputs to find out whether the latter are rationally employed or not, (ii) to make adjustments between the production and prices of both the factors and the outputs, (iii) to make necessary adjustments between machine dominated or labour dominated production, (iv) to make innovations where needed and (v) to decide on the claims of the production factors over the productivity gains made. Thus appropriate policies can lead to better earnings, happier industrial reltions, more effective work and savings in time, materials, fuel and power.

4.7 Changes in overall productivity may originate either in the productivity or in the combination-proportion. Productivity achievements

can be made and retained only when the relative market is kept stable and expanding. Ultimately, it is the quality of labour that is the most decisive component not only of labour productivity but also of the overall national productivity, because the labour input is the motivating force behind the potentialities of all other inputs.

4.8 Industrial productivity can be improved by making due provision for adequate transport, power, communication and credit facilities, the regularity in supply of material inputs, trained and contented work force, efficiency of the industrial research, a sound monetary management and fiscal policies and measures to expand both the domestic and foreign market. This pre-supposes that we in the State can help emerge a productivity minded labour leadership and modernisation of industrial techniques and scientific lay out of plants.

4.9 Increase in production does not necessarily mean increase in productivity. If the increased production hs been achieved by putting in more than proportionately higher resources, indeed productivity would have declined.

4.10 Labour input has been used extensively as a substitute to the resource total. The use of labour time to represent all input factors in the ratio of output obtained a resources expended can be attributed to the fact that the labour time expended per unit of output really measures not the specific contribution of labour but the productivity of all the input factors. The choice of labour man-hours as the common denominator in the calculation of productivity is made because in most countries statistical records on employment

(man-hours worked and workers employed) are available for a fairly large section of industries. The indicators commonly employed a measure productivity are (i) Gross output per man-hour, (ii) Gross output per unit-capital, (iii) Value added by manufacture per unit of capital employed and (iv) Other output-input ratios.

4.11 Value-added has the express advantage as a measure of economic performance in that it consists of wages and profits. Compared to highly developed countries, the labour content in value added will be fairly high in our case. This method of measuring economic performance too, like the foregoing ones, is subject to many limitations. Violent fluctuations in the market price of output and material inputs cause value added to go up and down regardless of the capacity at which productive resources are employed. Value-added figures may not be a too meaningful indication of economic performance because of arbitrary inclusion of cost items. An increase or decrease in the total value-added cannot be attributed to any agent of production without resort to the utmost arbitrariness. Value-added as a percentage of productive capital, in productivity measurement, may sometimes be found more concealing than revealing. For instance, the nature of capital equipment may have a more pronounced effect on value added. An industry that employs a more efficient or productive capital stock such as oil refineries has higher value added, created through the process of manufacture as contrasted with another industry which involves the use of labour-using and capital saving instruments of production.

4.12 Input-output analysis, if insulated against changes in price indices, can also serve as a reliable measure of productivity but this method too suffers from certain drawbacks. For perpetual changes in the techniques and pattern of production as a result of technological advancement, the ratio of input to output would tend to become ineffective and meaningless. The volume measure of production would not reflect changes in the degreeof process integration although such changes would be immediately reflected in the volume of input. For instance, if a weaving mill instead of purchasing its supplies of yarn from a spinning mill decides to set up its own spinning section, its value-added would show an immediate increase while the total output, if measured in terms of finished product, may not show any appreciable change. The input-output ratio, may, therefore, reflect not the difference in productivity but only the difference in the degree of integration

4.13 In this discussion, attention has been focussed on industries as a whole and productivity has been measured from different angles in order to throw the problem into bold relief through cross-sectional analysis. The percentage figures in the table below have been computed on the basis of the data contained in the Census of Manufacturers/Annual Survey of Industries for 1951-1981 and in Summary Reports for 1982 and 1983. Value-added by manufacture per worker has been deflated by the wholesale price index, base shifted to 1951 = 100 (Table 4.1).

Table 4.1

Measurement of Productivity from Various Angles

(All Industries)

Year	Value of output as percentage of total input output		Value-added as percentage of productive capital		Value-added per worker (Rs.)	Deflated index of value added Per worker	Wage as percentage of value-added		Real wage Index Numbers
	Ratio	Index	Ratio	Index	Rs.		Ratio	Index	
1	2	3	4	5	6	7	8	9	10
1951	139	100	49	100	2346	100	44	100	100
1952	140	101	43	87	2114	106	51	116	126
1953	147	106	46	93	2288	112	49	112	124
1954	145	104	47	95	2437	125	46	105	128
1955	147	106	49	100	2638	147	42	95	149
1956	145	104	47	95	2790	139	41	93	136
1957	142	102	41	83	2785	131	43	98	132
1958	147	106	40	81	3062	141	40	91	135
1959	151	109	47	95	3242	144	37	84	131
1960	138	99	45	91	3350	139	40	91	127
1961	136	98	42	85	3606	147	39	89	142
1962	136	98	32	64	3855	155	41	93	147
1963	138	99	32	64	4266	165	37	84	146
1964	..	..	..	..	..	..	..	..	136
1965	135	97	26	53	5082	161	37	84	140
1966	134	96	24	49	5563	155	37	84	134
1967	138	99	24	49	5442	132	38	86	124
1968	..	..	..	..	..	..	..	..	135
1969	138	99	26	53	6766	156	35	80	135
1970	..	..	..	..	..	..	..	..	132
1971	137	99	27	55	7443	147	34	77	126
1972	137	99	27	55	7826	145	35	80	127
1973	..	..	..	..	..	..	..	..	..

Contd....

1	2	3	4	5	6	7	8	9	10
1974	135	97	42	86	9778	..	35	80	..
1975	134	96	47	96	12826	151	30	68	84
1976	130	94	40	82	12590	151	34	77	140
1977	130	94	41	84	13807	154	31	70	143
1978	129	93	41	84	14350	161	31	70	154
1979	133	96	30	61	16859	188	32	73	155
1980	132	95	29	59	18224	152	32	73	121
1981	129	93	28	57	19727	...	33	75	...

4.14 The behaviour of the input-output ratios proves beyond doubt that the percentage rise or fall in the value of both input and output has been nearly of the same magnitude over the period under observation. The productivity of all input factors does not show appreciable variation, excepting in the year 1959, which reveals that the value of input resources expended has been smaller than the value of output obtained. The relatively significant variation in 1959 seems to be due to the inclusion of a large nuber of high productivity industries in the Annual Survey of Industries in that year relatively to those covered in the Census of Manufactures till 1958. Even the wholesale price index, after having attained parity in 1959, does not fully measure up comparatively large increase in the value of output.

4.15 Both the productive capital employed and the value-added by manufacture have been expanding but the rate of capital expnsion hs been constantly overstepping the rate at high value added has been progressively rising. The former comes to assume the role of a fore runner by a big margin over the latter. A considerable fall, nearly of one-third in capital productivity by 1963 over the base, is borne out by the index of

value-added as a percentage of productive capital employed. Though the respective values have not been deflated by appropriate price indices to ensure sufficiently accurate results there is no getting away from the fact that the relative price indices have deviated from each other only by a small margin. If this gap is taken into consideration, the low productivity of capital will be further accentuated. One must not however be oblivious of the huge investment outlay mainly incurred during the planning period under observation, the bulk of which has been expended in building up a broad industrial base requiring long gestation period. Technically speaking, productivity, potential as against actual, has been positively going up.

4.16 If the deflated value-added per worker is adopted as a criterion to measure labour productivity in our industries, its continuous upward trend is clearly discernible throughout attaining its peak in 1963 and in 1979. This is probably because of the improvement in technology. Substitution of capital for labour, cost on improvement in technology and improved machinery seem to have contributed substantially towards the improvement in skills of the operatives resulting in higher productivity especially during the year 1963 and 1979.

4.17 The relation of value added to wages of production workers is not significant. The value dded is the contribution of the manufacturing process and has to be shared by workers with other input factors. Since the wages of workers constitute the largest component in gross national product, it is, therefore, instructive to know about the share of value-added going to production workers. The knowledge of wage-value added ratios does not necessarily tell us much about the equitable distribution of productivity gains. The nalyst must be on the guard when interpreting these ratios for

a lower ratio in an industry may not represent a relatively poor economic condition of the working people. The main reason why the ratio of wages to value-added is lower in capital intensive industries seems to be explained by higher value added rather than lower wages. This is so because value-added in capital intensive industries is high. On the other hand, in labour intensive industries higher ratio of wage to value added may be due to lower value added rather than higher wages. In most cases it would be pretty difficult to explain precisely what factors account for the differential in the ratios of wages of value added. The analysis would show the following. Labour used per unit output (at constant prices) is declining whereas capital per unit output is increasing. Hence share of wages in value-added is found to fall. This is due to (a) technological progress in which more and more capital is substituted for labour and (b) generally new investments are increasingly capital intensive.

4.18 The year 1975 reaffirms the foregoing observations more forcefully. The percentage share of wages in the value added has been erratically moving up and down throughout. It touches the lowest point in 1975 not necessarily because of a reduction in wages but because of a larger increase in the value added. It is the sizable increase in the latter that has pushed down the wage-value index. This does not, however, mean that the real wage of the individual worker should consequently decline; it may move up as has actually been the case throughout the period under investigation. This is also an indication that the skills of an average worker is also going up.

4.19 It must, however, be recognised that there exists a close connection between productivity and

real wages. Wages can gain at the expense of profits, interest, rent and other shares in the total product. Workers in a particular sector of industry can obtain real differential advantages in wages over workers in less prosperous industries. But for the economy as a whole, in the long run, the general level of real wages tends to rise only as fast as productivity increase. A rising standard of living for a nation is obtained largely from productivity gains.

4.20 Whatever may be the indicators used - it is clearly established that productivity has been declining and average cost of production rising in large scale industries during the four decades 1946-1983. Planners can no longer assume a constant capital-output ratio nor can the cost-push pressure on prices be resisted. This is a conclusion that can be drawn from the major trend in the macro productivity of Indian industries covered by Census of Manufacturing Industry and the Annual Survey of Industries during 1946-83.

Capital Intensity and Productivity of Labour and Capital

4.21 We may examine the trends in three critical ratios representing capital intensity and productivity of labour and capital. We observe that (i) capital intensity or average capital per employee (k 1/L at constant prices) has increased steeply from Rs.3225 to Rs.6503 or by nearly hundred per cent between the six years period 1984-53 and the period 1958-63. (ii) productivity of labour as measured by value added (in constant prices) per employee (v 1/L at constant prices) has also registered an increase by about 40 per cent. But inspite of this increase, value added per rupee of labour cost (v/cl) has declined by 5.5 per cent. This implies

that the total monetary compensation (in constant prices) per unit of labour has increased more (48 per cent) than its real productivity. (iii) The productivity of capital as measured by value added per unit of capital (v/k) has declined by about 18 per cent. This implies that the capital-output ratio (K/v) has increased from 1.8 to 2.6 or by 43 per cent.

Implications

4.22 There is an increase in capital intensity associated with the progressive mechanisation of old consumer goods industries and the establishment of new capital intensive industries which has resulted in an impressive increase in the average productivity of the labour i.e. the deepening of capital. It was commonly believed that in countries which suffer from an abundance of labourers and scarcity of capital, capital intensity may rise or may be allowed to rise more slowly than in countries with high level of factor endowments. But this view is not borne out by recent Indian experience. In fact capital deepening has proceeded as fast in India as anywhere else. It is also an indication of the rise in capital output ratio at the marginal output.

Conclusion

4.23 The following implication of declining productivity and rise in costs deserve serious consideration (i) planners can no longer assume a constant capital-output ratio. On the contrary, every additional unit of investment should now be expected to yield a diminishing increment of output. This means that the capital requirements of the given rate of growth of industrial output must be much larger than in the past. Conversely any given plan outlay should be expected to yield a much lower rate of industrial growth.

ii) The increase in industrial costs should (a) decelate the growth of the industrial sector itself by limiting the expansion of the home market and (b) progressively reduce the competitiveness of exportable (non-traditional) manufactures. In consequence either balance of payments difficulties must increase or the burden of export subsidies required to sustain the same volume of exports must grow.

iii) A declining productivity must increase the cost-push pressure on prices. In the next phase of planning, therefore, the achievement of a high rate of industrial growth will be extremely difficult even with an increased plan outlay. Therefore, attention has to be given to the recovery of productivity.

iv) All elements of import control, exchange control, industrial licencing and commodity control policies which have reduced the pressure of competition on manufacturers and created pockets of oligopoly or privileges or assured high prices, unrelated to any norms of efficiency must be readjusted so as to stimulate efficiency. The administrative structures, procedures and reward and punishment system which are inimical to productive efficiency must be overhauled.

v) The educational system must be reorganised to produce a profile of skilled manpower which corresponds to the profile of demand for various types of skills arising in the modern industrial set up. And the stock of untrained and mistrained manpower already employed in industry and administration must be retrained so that it acquires the knowledge required.

vi) There has been much talk of action on these lines. But vested interests have successfully prevented any real reforms. If real reforms are not undertaken voluntarily and in time, the economic crisis created by a continued decline of productivity will be so serious that they will have to be undertaken under abnormal pressures.

Unused Capacity

4.24 In the short run, the possibility to increase production through a fuller utilisation of available capacity is of great significance. In any definition of capacity, it is necessary to include all the existing capital facilities, even those of which are provisionally shut down and to calculate the existing productive capacity on a maximum number of skills whenever this is technically feasible.

4.25 In any scientific system of calculation, one should include also installations that can be put to work with relatively small investments. It may be argued that if instead of a technological approach, one adopts an economic approach which takes into consideration the existing cost, price and demand structure there should never be any unused capacity. The argument is that plants which once closed down are economically inefficient and therefore cannot generate demand for their product at a given price structure. May be some such factories are producing products which have become obsolete because of a change in the consumer preference.

4.26 This argument holds that in such circumstances there is in reality no surplus capacity and the so called under-utilisation is a healthy process as it eliminates inefficient plants. Another argument usually advanced is that in certain cases, the unused capacity

is due to a shortage of input items which are in absolute short supply in the World market or that they are in shortage in the local market without the possibility of importing them (e.g. electricity, skilled labour of certain varieties). Another view is that a certain unused capacity should always be left in order to be able to meet a sudden spurt in the demand. These and other objections point out the fact that the definition of the notion of installed capacity is related to the purposes for which the installed capacity and its rate of utilisation if calculated. But in the context of Indian planning, calculation should actually serve as a guide for planning and that too in an economy where the most important productive force, viz., labour, is in abundance.

4.27 What we need, therefore, is a technological definition of productive capacity. If there is unutilised capacity due to high production costs resulting in insufficient demand, every possible step should be taken to lower the production cost and increase demand either by way of tax reductions or even subvention for this particular product or by increasing the purchasing power of the population.

4.28 A study of the unutilized capacity is an essential starting point for a probe into the technical structure of certain industries. Many of the industries work mostly much below their capacity whereas it is clearly that the development of these industries is essential for the future growth of the economy. It is scandalous for a country like India, which is short of capital and technical know-how, to allow the built-in capacity in the different spheres of economic netivity to be wasted year after year.

4.29 Though a number of studies regarding the assessment of excess capacity, especially in the industrial field, has been undertaken and revealing results thrown out, organisational adjustments and improvements necessary to prevent the huge waste have been slow and inadequate. The problems of under-utilisation of capacity is, therefore, getting more and more acute.

4.30 Over the three decades, there has emerged in the industrial sector a significant quantum of unutilised manufacturing capacity. Simultaneously there has resulted a decline in the rate of growth of output. These two developments taken together are clearly a matter of serious concern.

4.31 Estimates of unutilised manufacturing capacity vary a great deal. The USAID estimates of 1965 put it at 75 per cent in the case of engineering industries and 15 per cent in the case of chemical industries. The NCAER estimate on the other hand was only 30 per cent in the case of engineering industries but over 50 per cent in the case of chemical industries. In view of the crude nature of these estimates and the wide variations therein, one has to be very careful about the uses to which they are put. The existence of unutilised capacity is often considered as an adequate basis for reasonably expecting substantial increases in industrial output.

4.32 A near full utilisation of this capacity in a country like India is a function of increasing rapidly the output and income of the agricultural sector opening the way for a rapid increase in the private consumer demand for both agricultural and non-agricultural products. A part of the private consumer demand will be not agro-based but chemical-based like synthetic textiles,

plastic goods and metal-based like bicycles, electrical and electronic appliances. The consumer demand for most of these products comes from the top strata of society. The industrial and commercial policies followed hitherto in India have provided ample scope for rapid growth of income of this class of people which have tended to an accentuation in the inequalities of income and wealth. Slowly we are adopting a pattern of industrial development based on high rates of growth of demand for luxury and semi-luxury products. This also leads to a policy which aims at attracting the multi-national corporations and fostering the expansion of such of them which are already established in the country. The Government has been using various instruments particularly credit, income and fiscal policies to foster and steer income concentration and creating in the process a sizeable group of rentiers within the middle classes thus engendering a new type of capitalism heavily dependent upon the appropriation and utilisation of profits to generate an elitistic type of consumption expenditure. This is a dangerous path for the nation and the people. The alternative would call for a class war against the entrenched power groups, radical socio-economic reforms in agriculture, linking the future pace and pattern of industrial development with the growth of incomes from agriculture, much more attention to small scale industries catering to rural needs as also restricting or altogether preventing the growth of certain kinds of industries in the large scale sector.

4.33 The major single cause for the idle capacity of the present magnitude in industrial sector is the acute scarcity of raw materials, power and transport. The existing margin of under-utilization of industrial capacity is of the order of 35-40 per cent in India.

Transport bottleneck is responsible at least for a fifth of the current under-utilisation. Administrative delays also contribute to the poor utilisation of the capacity.

4.34 Due to inter-industry linkages, the under-utilisation of capacity in one sector effects the capacity utilisation in other sectors as well. For example, a bottleneck in transportation in terms of availability of wagons might reduce the movement of coal which in turn would affect the production of electricity and steel. Since these being key inputs a shortfall in the generation of electricity and steel output would affect a number of other industries.

4.35 The National Council of Applied Economic Research, in its study titled "Under-utilisation of Industrial Capacity" indicates three main factors for under-utilization, viz., shortage of raw materials, shortage of foreign exchange and labour troubles. The study admits: "the fact that our survey of even these factors lacks so much in quantitative estimation of our requirements is, perhaps, an index of the neglect of this problem both at the hands of the authorities and of the business community". A study of the United States Agency for International Development in 1966 showed that out of the 1530 industrial units covered, 60 per cent had one shirt, 19.6 per cent two shifts and 20.3 per cent three. The normal duration of work in a factory is considered to be one shift of eight hours, six days a week in India. But if various obstacles are removed, it would be able to raise the level of production by 200 per cent above the normal capacity by adopting 3 shifts. On this account the excess capacity in Indian industry is very high indeed. In fact, one finds very

rarely such under-utilisation of capacity even among the under-developed areas of the world. A survey conducted by the Calcutta Metropolitan Planning Organisation in 1962 for the Calcutta Metropolitan District showed that the rate of utilisation was the highest in manufacturing group employing 100 or more persons and lowest in the group employing between 5 and 24 persons. A study by Morris, J.Solemon of the Indian Statistical Institute (Calcutta) in 1963 draws attention to the problems of unutilised capacity of Indian Industry. Discussing the question of multi-shift operations, he says;

> "Under Indian conditions, the efficiency of the third shift can be fully as good as the first shift, provided shift supervision is in competent hands. Generally a third shift is easier to manage if the jobs are foutine. But if only some jobs are routine, one can allocate to the third shift those jobs which are most straight forward ..... whatever difficulty arises in the third shift, there is a remedy. For example, if there is a quality difficulty one can have tighter inspection, better supervision, special incentives, better lighting, with additional cost generally being the less than the value of increased production. In many cases the third shift needs better supervision than other shifts".

4.36 Further, by the adopting of suitable organisational changes and incentives it would be possible to reduce the time in which the machine waits for operator, especially during multiple shift operations.

Increase in labour costs and difficulty in getting skilled labour are only minor troubles if we compare the gains accruing from the adoption of three shifts.

4.37 In India under-utilization of capacity is also the outcome of haphazard industrial licensing which had led to the installation of capacity in excess of raw materials availability. As observed by Morris J Solomon "excessive licensing of capacity is truly an ill-wind that blows no one any good". It is understood that Government of India is thinking of not setting up more units in the Public Sector under certain industrial categories where there are a number of private units with unused capacity.

4 38 To meet the requirements of the present difficult situation, production programming appears inevitable This involves the preparation of tentative production schedules. They can then be converted into requirements of materials and manpower Estimates of supplies of the various materials and manpower could be compared with the estimates of requirements If there is a deficiency in the supply of materials and men, tentative production schedules can be cut back to the size of availability. Once formulated, production schedules for various items will become procurement schedules. There are statistical techniques available today to estimate the requirements of parts and materials for many end items through the use of conversion factors. Once the conversion factors are thus determined, it is relatively easy to compute the requirements of goods in terms of materials and manpower.

4.39 Good programming can thus cut out two forms of waste, the waste of trying to get more than what is possible of everything and the waste of unbalanced output of various parts and materials for an end item. The operational significance of these measures should be clearly understood by all levels of the Government and business administration.

4.40 Despite many solid achievements of our country since independence it has to be admitted that growth of productivity both in agriculture and in industry has not been very impressive. One is left with an unmistakable impression that there has been no strong trend in favour of increased productivity.

Agricultural Productivity

4.41 There is an apparent failure of agricultural growth to respond to High Yielding Variety and the faster increase in water and fertilizer inputs. Except in wheat and rice areas, these factors made hardly any difference to dry farming. The performance of new varieties is dependent on the quality of water control. Most of the Indian surface irrigation systems are not capable of regulating irrigation schedules according to crop water needs of different segments of the command areas. Further the interests of rich versus poor farmers and head versus tail-end farmers do not mesh smoothly either in access to surface irrigation or in the use of groundwater. The problem here is one of lack of organisation for effective management of systems serving a large number of users. We are also still waiting for a significant technological breakthrough in dryland agriculture and for major varietal

improvements in oil seeds, pulses and several of the coarse grains. Production has not been increasing as much as the growth of input use would warrant, and this is a serious source of concern. With agriculture constituting about half the G.D.P. and providing the bulk of the economy's consumer goods and of raw materials for a considerable part of the industrial sector, its growth is a critical factor limiting the growth of the industry etc.

4.42 The tendency for increases in production to be concentrated in the relatively better off regions and classes of farmers would make for marketed surpluses growing faster than production. This, when combined with the State's inability to intervene on a national level plans through procurement and public distribution of food, leads to perpetuating inequalities - region-wise and class-wise. The agricultural situation in India, therefore, represents a high degree of unused capacity not only in respect of its production and productivity potential but also with regard to its untapped capacity of labour absorption.

Industry

4.43 Value added in manufacturing grew at 6 per cent per annum during the first three Plan periods, but decelerated since then which has hit all major categories of industry viz., consumer goods, intermediate goods and capital goods (Table 4.2). The relatively slow growth of income during this period has led to a slow growth in the demand for consumer goods. There is also some evidence to show that higher savings during this period was the result of worsening income distribution between rural and urban areas and between

different classes and its effect was felt on the pattern of demand. These pattern shifts were between traditional products and modern factory made substitutes on the one hand, and between non-durable and durable consumer goods on the other. Since growth prospects of consumer industries depend primarily on the expansion of home demand which is dependent on the capacity of the consumer industries to increase their level of efficiency so as to bring down the relative price of their products, there seems to be hardly any possibility of the latter happening. Under these conditions the machine building capacities built-up in the sector get more and more unutilised.

4.44 In the case of capital goods, indigenous production in the early fifties was very small. But in the latter period it expanded very rapidly due to import substitution. The ratio of imported machinery to total absorption fell from 34 per cent in 1950-57 to 20 per cent in 1970-71. In several branches of the industry notably heavy electrical, metallurgical, mining and railway equipment, indigenous production capacity was planned on the basis of certain projected rates of capacity expansion in user industries. Actual expansion of capacity in steel, coal, electricity generation, and railway freight has been far below these expectations. These factors have led to large unused capacities in these branches of production. Presently there is a danger of more liberal imports of equipments in the name of getting the best technology. This will not only prevent the expansion of indigenous production but also adversely affect the full utilisation of the built-in capacities. We cannot have a vigorous and healthy machine industry without a clear long-term

Table 4.2

Net Value Added in Manufacturing

(At 1960-61 Prices)

Sectors	1951-54	1964-67	1977-80	Average annual growth rates % 51-54 to 64-67	64-67 to 77-80	51-54 to 77-80
1	2	3	4	5	6	7
All manufacturing (Rs. crores)	1111	2566	4417	6.6	4.3	5.5
--- Consumer goods	811	1470	2418	4.7	3.9	4.3
--- Intermediate goods	175	573	1114	9.6	5.2	7.4
--- Capital goods	125	523	885	11.6	4.1	7.8
Registered manufacturing	603	1581	2753	7.3	4.0	6.0
--- Consumer goods	387	664	1051	4.2	3.3	3.9
--- Intermediate goods	156	538	1050	10.0	5.3	7.6
--- Capital goods	60	379	652	15.3	4.3	9.6
Unregistered manufacturing	508	985	1664	5.2	4.1	4.7
--- Consumer goods	424	805	1367	5.0	4.2	4.6
--- Intermediate goods	19	35	64	4.8	4.7	4.8
--- Capital goods	65	145	233	6.4	3.7	5.0

Source: CSO, National Accounts Statistics, March 1975 & February 1982

Note:- (1) There are some problems of comparability in classifying industries into consumption, intermediate and capital goods, since the CSO's industrywise break-up changed between the sixties & seventies, especially for unregistered manufacturing. For registered manufacturing industries 1,2,3,4,15&16 were treated as consumer goods, 5-11 as intermediate goods, and 12-14 as capital goods. For unregistered manufacturing, before the seventies, groups 1,3,6&7 have been treated as consumer goods, 2&5 as intermediate goods, and 4 as capital goods.

Contd.....

strategy regarding the technology to be used in major industries and conscious coordination of this strategy with the institutional arrangements for design and engineering.

4.45 In the case of basic and intermediate goods the slow down in production experienced recently is as much a reflection of the slackness of demand as of low rate of capacity utilisation. Output in many important sectors like steel, fertilisers and electricity is much below the available capacity. In 1979-80 of the 133 public enterprises under production for which data are available, 21 per cent operated at below 50 per cent capacity utilisation, 32 per cent operated at between 50-75 per cent, and 47 per cent operated at 75 per cent of the capacity. The ratio of imports to total absorption during this period was 37 per cent in nitrogenous fertilisers, 23 per cent in aluminium, 16 per cent in saleable steel and 87 per cent in newsprint. The problems on the side of full utilisation of productive capacity lie mainly in the sphere of managements, labour relations and critical shortages of inputs. Better capacity use and improvements in the operational efficiency of intermediate goods like energy and transport are directly linked to the desired reduction in costs and prices. In short, the prevailing situation on the industrial front in India calls for immediate attention to identify and remove institutional constraints which contribute to inefficient use of capital both in the public and private sectors.

Note (2) The performance of unregistered manufacturing appears to be slower than the growth rate in the factory sector, but its deceleration is also less.

Note(3) There appears to be a deceleration even within the consumer goods sector in registered manufacturing.

4.46 Problems of productivity and capacity utilisation are becoming crucial to growth and diversification of Indian industry. This is more so in the public sector due to its share in the total reproducible national wealth. Its share has grown from around 18 per cent in 1950-51 to over 45 per cent in 1979-80. It may be noted that the share of the public sector in net output is much smaller (7.5 per cent in 1950-51 and 21 per cent in 1979-80) because of the fact that the public sector's investment are concentrated in highly capital intensive activities. The record in terms of profit earned is worse. Net pre-tax profits of 178 public enterprises after setting off losses in 1979-80 was only Rs.1046 crores; 81 per cent of it was coming from 13 financial institutions and insurance companies. Non-financial enterrises as a group returned meagre profits (Rs.739 crores from 97 companies) or losses (Rs.530 crores from 68 companies). Net savings from public enterprises continued at 3 per cent of the net domestic savings throughout the seventies The low level of surpluses generated by the public sector is a measure of the inefficiency in the use of factors of production in respect of capacity utilisation and productivity. There is also the charge that Indian Public sector is being used more and more for providing benefits and subsidies to particular classes of people which, in fact, does not really serve a redistributive role (Table 4.3).

4.47 Lastly, there has developed over time ageneral tendency to use public spending as a source of patronage. This in turn makes for laxity in matters of project planning and execution as well as exercise of financial control. The over capitalisation of public

Table 4.3

Role of Public Sector in the Indian Economy

Item		1950-51	1960-61	1970-71	1979-80
1. Share of Public Sector in NDP - Total	%	7.5	10.6	14.5	20.7
(a) Of which Administration	%	4.5	5.5	7.0	8.0
(b) Enterprises	%	3.0	5.1	7.5	12.7
2. Share in National Expenditure	%	8.3	13.0	18.0	NA
3. Government Revenues as % of NDP	%	6.6	10.2	13.9	NA
4. Public Investment as % of Total Investment	"	23	44	38	47
5. Share of Public Sector in Capital Stock	%	18	33	44	NA
6. Public Savings as % of GDS	%	17.2	20.6	18.5	17.4
7. Public Sector Savings as % of NDP	%	1.9	2.5	3.0	4.3

Source:- CSO, National Accounts Statistics, various issues and Public Enterprises Surveys, 1980-81 R.N.Lal.
Raj Committee on Capital Formation and Savings in India, 1950-51 to 1979-80, RBI, 1982.

enterprises and construction of projects and their use as a vehicle for concealed subsidies to a variety of private or political interests is part of this syndrome which has led to long gestation lags, cost overruns and feather bedding. In short, high costs and subsidised prices have combined to produce low returns from our public enterprises which simultaneously is a function of low productivity and low capacity utilisation.

CHAPTER V
EDUCATION

The promotion of education on systematic lines was taken up in 1951. The relevance of mass education was emphasised during 1951-56 period. During the Second Plan (1956-61), education was viewed as a determining influence on the rate of economic development. The Third and Fourth Plans emphasized the need to remove deficiencies of the educational system and to usher in rapid development of science and technology linking it purposefully with increasing demands of social and economic development. During the Fifth and Sixth Plan periods the crucial role of education was recognized as the key factor in production through the creation of requisite manpower of quality. Stress is also laid on universalisation of elementary education. The main objective is now on the acquisition of functional skills of relevance to daily life as well as an understanding of the environment.

5.2 The Kothari Commission, therefore, wanted to transform the educational system "so as to relate it to the life, needs and aspirations of the nation". The goals of education were set to include not only knowledge and skills in the individual for future use in the production process but also socialisation, national integration, development of political awareness of individual character. In the basic laws that are practised, often declaration is made that the finer human qualities are superior to every other consideration, but in allocating funds, priorities often get reversed.

5.3 Enrolment at different stages of education has shown substantial increase in the last 34 years of planning (Table 5.1). The number of educational

Table 5.1

Enrolment of Students: 1950-51 to 1984-85

Enrolment by Stages(in '000)	1950-51	1960-61	1970-71	1980-81	1984-85 (likely)
1. Primary I-V Classes	19,155 (42.6)	34,994 (62.4)	57,045 (76.4)	72,688 (83.1)	85,377 (91.8)
2. Middle VI-VIII Classes	3,120 (12.7)	6,705 (22.5)	13,315 (34.2)	19,846 (40.0)	26,729 (53.1
4. High/Higher Secondary/ Intermediate	1,481	3,483	7,167	11,281	16,800
5. University & above (Ist Degree)	174	557	1,956	2,752	3,442

(Figures in parenthesis indicate enrolment as percentage of the population in the age group)

Source:- Seventh Five Year Plan, Vol.II, Planning Commission.

institutions has also increased many times between 1955 and 1985 (Table 5.2).

5.4 In the case of the under-privileged sections of the population - the scheduled castes and scheduled tribes - enrolments have increased considerably indicating an increased access to educational facilities (Table 5.3). Expenditure on education has shown a fifty fold increase from Rs.114 crores in 1950-51 to Rs.6000 crores in 1984-85. Efforts were also made to improve the quality of education and to enhance its relevance. The adoption of the 10 + 2 + 3 pattern has helped to bring about

Table 5.2

Educational Institutions: 1950-51 to 1984-85

Institutions	Y E A R				
	1950-51 (Actual)	1960-61 (Actual)	1970-71 (Actual)	1980-81 (Actual)	1984-85 (Likely)
1. Primary	209,671	330,399	408,378	485,538	550,000
2. Middle	13,596	49,663	90,621	116,447	140,000
3. High/Higher Secondary	7,288	17,257	36,738	51,594	60,000
4. Colleges:					
a) Arts,Science & Commerce	548	1,161	2,587	3,393	3,500
b) Professional	147	381	1,017	1,382	1,500
c) Universities & Deemed Universities	38	55	94	234	245

Source:- 7th Five Year Plan,Vol.II,Planning Commission

Table 5.3

Progress in Enrolment of Scheduled Caste & Scheduled Tribe Students 1951 & 1981

Stage of Instruction	% coverage to corresponding age group				
	Boys	Girls	All communities	Sch. Castes	Sch. Tribes
Primary (I-V Classes)					
1951	59.8	24.6	42.6	11.7*	5.3*
1981	99.4	66.9	83.7	86.0	73.7
Middle (VI - VIII)					
1951	20.7	4.5	12.7	9.3*	3.5*
1981	54.2	29.1	41.9	9.3*	3.5*
Secondary (IX - XII)					
1951	8.7	1.5	5.3	0.1*	1.7
1981	34.2	14.0	22.0	NA	NA
Collegiate					
1951	0.75	0.10	0.4	NA	NA
1981	4.8	1.02	4.0	NA	NA

*Relates to 1967-68 NA = Not available

the desired uniformity in education throughout the country. A beginning has been also made to vocationalise secondary and higher secondary education with a view to providing students skills which they can use in their day-to-day life.

5.5 However deficiencies continue to prevail in the educational system. Nearly two lakh habitations in the country are yet to be provided with primary education facilities within a walking distance of 1 KM. There is also the problem of large per cent of children who drop out of the system without acquiring basic skills. A large proportion of primary schools are without buildings and do not have even basic teaching equipments. The teachers receive little technical and academic guidance. These deficiencies are largely a consequence of the inadequate investments and whatever funds there are, is mostly spent on salaries with the result very little is available for the improvement of quality.

5.6 The position is not very different in the matter of higher education or technical education. Attempts have been made for restructuring under-graduate courses to forge linkages between education, employment and economic development. In the field of technical education, efforts have been made to provide facilities in key areas of science and technology along with optimum utilisation of existing facilities.

5.7 Kothari Commission's recommendation that "it is essential to vocationalise secondary education and to work towards a target wherein about 20 per cent of the enrolments at the lower

secondary stage and about 50 per cent of those at the higher secondary stage would be in vocational education" is accepted enrolments in Schools and Universities in 2000 A.D. may be projected as in Table 5.4.

Table 5.4

Projected Enrolment in Education - A.D. 2000

Class/Age Group	Enrolment (in lakhs) A.D. 2000 (Projected)	1980-81
I to V/6-10	1150 (110)	726.8 (83.3)
VI to VIII/11-13	520 (85)	198.4 (40.0)
IX to X/14 and 15		
(a) General	240 (60)	
(b) Vocational	60 (15)	112.8
XI to XII/16 and 17 General	95 (25)	
University (General & Professional)/18-23	130 (12)	27.5

(Figures in brackets indicate enrolment ratio relative to population in the corresponding age group)

5.8 The anticipated phenomenon of expansion in the next two decades obviously calls for an increase in expenditure on education for setting up of more and better equipped schools and colleges, recruitment of trained teachers, production of high quality text books and effective supervision in their administration. At present there are about 5.5 lakh primary schools, 1.4 lakh middle schools and 60,000 higher secondary schools. In

the next two decades it will be essential to expand the existing schools to accommodate the anticipated additional enrolment. On the basis of a standard norm of 1 class room for 45 students it would require about 35 lakh more class rooms. Many of the existing school buildings which are in a dilapidated condition will need to be replaced by new ones or extensively repaired to ensure minimum standards of safety, sanitation and education. In addition, secondary schools will have to be provided with other facilities such as laboratory, library, vocational training equipments etc. To sum up total investment in school buildings and allied activities will entail an expenditure of over Rs.6000 crores at current prices in the next two decades.

5.9 At present there are about 5000 collects including research institutes in the country. These would be hopelessly inadequate to absorb an enrolment of about 130 lakh students in 2000 A.D. The country would then have at least 10,000 colleges which would mean setting up of another 5000 colleges more. The shortage of qualified and well trained teachers will be another major problem which the country would face in the next two decades. Along with other needs of education, mention may be made of the likely requirement of paper for text books and stationery as the prevailing shortage of paper the world over is unlikely to ease in future owing to the rapid depletion of the forests and wood resources. Advance planning to meet this demand becomes essential. The task ahead is truly bewildering and yet what passes for education today even in our best schools and colleges is a hopeless affair. Planning for quality in the

circumstances makes for more demands on human efforts and ingenuity than on physical and material resources.

5.10 The Government of India in its attempt to formulate a national education policy has issued a policy perspective entitled "Challenge of Education" in August 1985. The document makes it clear that several states in India have very poor records in the matter of elementary education for the age-group 6 to 14. A critical review of the progress of universalisation of education in India shows that there is little comfort in the enrolment figures reaching the 93% level, because the abnormally low retention rate and high drop-outs have eroded the gains from expansion and resulted in enormous wastage of resources. The quantitative expansion of schools without the basic infrastructural facilities such as drinking water, urinals, blackboards and other teaching aids, play grounds and a sufficient number of teachers seem to have produced a distaste for education in the young pupils in their impressionable ages and accounted for staggering rates of drop-outs especially in the rural sector in several States. It appears that even the multilateral expansion cannot cover the 192.5 million of age-specific population in the age-group of 6 to 14, which will emerge by 2000 A.D., because the budgetary requirement for elementary education and its multiplier effects of the higher sectors would be enormous at the all India level.

5.11 Some bold thinking on our educational objective and priority is called for. The founder fathers of our constitution cherished the hope that independent India would be able to achieve

universal elementary education by 1960. The National Education Policy formulated in 1968 advanced the date to 1990. But it seems that universalisation in the true sense of the term will elude us even by the close of this century. Today illiteracy is staring us on our face. Though the literacy rate has increased considerbly during the post independence period from 16.7% in 1951 to 36.23% in 1981, female literacy is much lower; the national average being only 24.8% and average in some States like Rajasthan being as low as 5.4%. The World Bank estimates that there would be 500 million illiterates in India by 2000 A.D. The UNESCO's study has shown that the removal of illiteracy is a necessary pre-condition for the success of universalisation of elementary education. Adult literacy creates, a demand for the education of the children. It also lends a fillip to family planning and thus to restrain the population growth. Literacy also contributes to the success of democratic Government based on adult franchise. Therefore, without the removal of illiteracy any attempt to achieve universalisation of elementary education would be chimerical. It follows that universal literacy should be our immediate primary objective.

5.12 The educational policy therefore, will have to be given asharp focus towards the attainment of this goal. The operational strategy may be spelt out as follows:

i) In the lower primary classes, the emphasis has to be not on extension of enrolment but on qualitative improvement in existing lower primary schools and the provision of attractions like noon-day meal, uniforms, etc., in order to step up retention rates considerably.

ii) In the second stage of elementary education viz., upper primary, we have to reckon with the fact that 40% of our population are below poverty line. At present the products of conventional secondary schools look down upon normal work and are unfit for any productive activity. Expert opinion regards the age of 10 as the most suitable stage at which children could be initiated into the world of work. This programme would considerably reduce the cost of providing educational facilities for non-attending children in upper primary schools and this will have a multiplier effect in reducing costs in the secondary sector of education.

iii) Programmes for those who opt out of the academic stream and part-time schools by way of non-formal education can also play an important role in educating them.

iv) We have an illiterate adult population (15-35 age group) of about 110 million. According to the World Bank estimate 54% of the world's illiterate population in the age group 15-19 will be in India in the year 2000 A.D. Adult education programme will, therefore, have to be virorously pursued with emphasis on functional liveracy i.e., functional education to illiterates which will have beneficial effects on their productivity. More and more voluntary organisations should be encouraged to participate in Adult Education Programmes which should become a mass movement. Political parties and social service organisations and their cadres should legitimately be expected to play a decisive role in the field of adult education.

Secondary Education

5.13 The 10 + 2 + 3 pattern was recommended as a policy objective in 1968 and adopted by most of the States with the exception of Rajasthan, Punjab, Himachal Pradesh and Madhya Pradesh. Butthere is considerable difference of opinion about what constitutes the core of the 10 + 2system. Some regard it as the reorientation of the pedagogic content of secondary schools covering the 10 years while others emphasize the accent on vocationalisation so that there is great diversity in the implementation of the 10 + 2 system. The generally prevalent types are the higher secondary and the pre-degree. Some States have also provided diversified vocational courses at the plus 2 stage, which may be terminal or not and are conducted inside or outside the secondary school. By and large, these institutions have turned out products whoare neither fit for absorption in industry nor competent to pursue self-employment. Vocationalisation is important but then it should be treated as such and special care given to it instead of it being treated as an "inferior system", as has been the case so far. Work experience programme, should be started at the high school level to highlight the link between work and education and also development of positive work ethics and work habits. While pre-vocational courses could be started at the secondary level, elementary vocational course should be introduced at the higher secondary level. Facilities for vocational education should be diversified to cover a large number of fields in agriculture, industry, trade and commerce and service. The skills imparted should be adequate for securing gainful employment

or self-employment at the end of the higher secondary stage while at the same time opportunities for pursuing higher general and professional education should be open to all The three language formula should be implemented in all States while the medium of instruction at the school level should be in mother tongue; learning in English and teaching English as an additional language at the higher level should be available Hindi should be taught as a compulsory language at the sixth standard onwards Innovations like open schools to accommodate drop-outs need to be encouraged. It will be useful if a less academically hard but vocationally rich programme is introduced in the regular system to bring back the drop-outs to the system The concept of model schools can be introduced to serve a variety of purposes, as centres of quality which can be visited and made use of by teachers in the locality as well as by the students in the neighbourhood schools to make use of the superior laboratories and other curricular facilities in them.

Higher Education

5.14 Admission to higher education at the under-graduate level present a serious problem. Inspite of rapid multiplication of colleges and the introduction of the shift system, it has not been possible to accommodate more than 50% of the students seeking admission in educationally advanced States like Kerala. This is fast creating an acute problem of over-crowding in Colleges and consequent indiscipline, managerial problems and fall in standards. While the need for limiting the number of entrants in the college is indisputable, there is considerable variations in opinion

regarding the *modus operandi*. Aptitude and other tests scientifically conceived and executed without leaving room for nepotism and corruption can provide the solution. Perhaps the U.G.C. can fix a national eligibility test for all college admission in the country. The system of continuous assessment of the performance of students will have to be preferred to the present system of annual examination. In respect of Scheduled Caste/Scheduled Tribe students, programmes of remedial teaching and special coaching will have to be extended in as many institutions as possible. Facilities for carrying on quality research work should be available in all universities and centres of higher learning. Without a sound base for research and publications, institutions engaged in graduate and post graduate teaching will astrophy.

Technical Education

5.15 In the field of technical education, it is necessary to create infrastructure facilities in the new areas of emerging technologies, vital for the development of the country and provide necessary facilities for education, training and research in those fields. There is great need for renewal of obselescense and improvement of quality and standards of technical education all over the country. In respect of polytechnics, upgradation of standards and modernisation will have to receive high priority and polytechnic education for women should be given priority attention. Quality improvement programme for acquiring higher qualifications should be extended to all technology and science institutions including polytechnics.

Distance Education

5.16 Higher education today is not a privilege of the elite few The spectacular expansion of T.V net work and the media greatly facilitate the progress of non-formal education The spread of secondary education will generate an unsatiable demand for higher education which even affluent states will not be able to meet through conventional college courses The facilities for private appearance at degree examination, the starting of correspondence courses and the rapid multiplication of parallel colleges are all developments to meet the increasing demand for non-formal and continuing education The coaching difficulties encountered in private appearance and the academic limitations of correspondence courses have today given birth to the idea of open university The facilities that are being created in respectof the radio and television, the space and time saved by these networks and the vast software that is being built up will help to create a vast potential waiting to be exploited for education of our people. Apart from being a recreation and information media, these could be fully exploited as instrument for quality instruction through the utilisation facilities thrown up by the electronics revolution. Three or four Open Universities covering the entire country can provide a healthy support system to our traditional education structure. Such a development will also pave way for the development of mass, consumer-oriented and large education industry in the country.

Politicisation

5.17 Politicisation has done havoc to university education by drastically reducing effective

working days and leading the students astray. The student community is influenced and directed by a maltitude of political parties each with its own student wing to cause disturbances for political ends. The formation of political parties on communal and regional lines has also led to formation of student bodies on similar lines which is most disturbing. Depoliticisation is, therefore, an urgent necessity. It beholds the nation to device ways and means for bringing about this much needed reform through a consensus at the political level.

Inculcation of Basic Values

5.18 Paradoxically enough, education, after we attained independence, has failed to inculcate into the young generation the wisdom and the basic tenents of our ancient culture and the basic values relevant to our plural society which are enshrined in our constitution. Human development is a much more complex and all encompassing affair than a mere economical syndrome. In a country like India - which has proved during its past glorious cultural heritage that "man does not live by bread alone" - it is ironical to acknowledge the deplorable fact that this unilateral attitude to human and social progress is hyper-trophied to a degree that betrays dramatically the purpose of its intense philosophy, as well as the original ethos of its people and the ecology of its land. Economic development is only a part of a whole and it has to thrive organically and systematically side by side with educational, psychological, ethical, cultural and spiritual development of mankind.

If this holistic approach is missed, the outcome will always tend towards excess of profit, competition, promiscuity and power, at the cost of harmonious, synchronous and holonomic growth of society at large. The one sided economic development of many countries today is characterised, on the one hand, by the total neglect of environmental considerations lending to the rapid and ruthless destruction of environmental integrity and harmony and on the other hand, by the systematic robotisation of human life leading frantically to the increase of mental stress, neurosis and moral and social break-down. Fortunately, a planetary awareness has started to grow in the mind of nations regarding the irretrievable loss of environmental wealth inflicted on our planet earth during the last decades of the century, as well as the social injustice that are going on in the name of economic development. A totally new outlook to human progress in general seems to rise as a necessary alternative among the new ruling generations of the world. Development and educational policies have begun to be revised in terms of health, harmony and safeguard of the planet's physical destiny. Peace seems to rise a wanted focus into a new paradigm of human and social progress.

5.19 From the Himalayas down to Kanyakumari, there is an endless variety of natural manifestations and phenomena within the individed unity of cosmic homogeneity that found its supreme sublimity in the Hindu philosophy which has sustained the soul of India with a conviction and fervour unparalled anywhere in the world. Peace of mind

is not treated as a luxury to be acquired after all material ends are fulfilled. It is understood as an essential substratum for all other aspects of life to thrive harmoniously. "Sakthi and Santhi" are the wrap and woof of India's colourful social tapestry. India is the only country in the world which still maintains the recognition of such a focal point. Each of our epics and puranas with all their regional or vernacular versions and variations has its special properties and qualities, its effect on man's social, moral and cultural life; and its sacredness for our cultural history consists precisely in the fact that there is not another one like it.

5.20 During the entire colonial period, and unfortunately during the post independence period as well, the educational system and the media in general neglected this great ancient wisdom of India. Along with falling standards, this lacuna has had a very adverse and debilitating effect on a whole generation. The new educational policy should give primary concern to this and make inculcation of the ancient wisdom of India and the basic values of our society the sheat-anchor of human resources development in the coming years. Teaching of the History of Freedom Struggle and the role played by freedom fighters will inspire patriotism and help in inculcating better civic sense among the young ones who are the citizens of tomorrow.

5.21 India has been passing through a stage of outdated pragmatism in the field of education for two decades now. It has failed to act as a catalystic agent for economic growth and social development. As it will raise the expectations

of the masses, so will it help to fan widespread disappointments and dissatisfaction. As we have seen elsewhere, even in 2000 A D more than 70 per cent of the population in India will live in rural areas and will work mostly on farm. The present education system has virtually neglected agriculture as well as the needs of the rural people. The situation must change quickly. Agricultural education should be made a part of the curriculum for students in rural areas even from the primary stage. The vocational schools in rural areas should also be of a different nature from those in the cities and towns. The rural vocational schools should be able to meet the manpower needs of rural industries and services and better trained students for self-employment. It seems necessary also to open more medical schools to train barefoot doctors and social workers using both allopathic and indigenous medicine We may note that students learning in Schools and Colleges in the next two decades will live a greater part of their active life in the next century and it is futile, therefore, to imprint on their minds out dated practices and obselete values. Hence a future oriented point of view must seek to anticipate substantial changes in economic life and in educational requirements. Student should be introduced to the concept of scientific methods and taught to gather and examine the data as well as to explore and identify relationships. They should be taught to "think" and not to "memorize" facts. General education even in schools should be so designed as to equip students for further learning to meet conditions of life in future. Students and teachers should be encouraged to visit new factories to gain work experience.

5.22 In the urban areas, the vocational schools should train students for self employment. The curriculum should, therefore, cover subjects like marketing and accountancy. Part-time schools and part-time work in different services and industries should be planned to help students to learn practice-oriented work experience.

5.23 The educational system we hope to build in the immedite future should;

i) Ensure that certificates of schooling are no longer required for most occupations. When employers become more skill-specific in their needs, a flexible education structure will emerge to meet the better specified demand;

ii) Require that middle and upper income students share a greater burden of the cost of their secondary and higher education. Explore the advantages of establishing an educational bank to transfer to the consumer the responsibility for both repayment and purchase of educational services. Time spent in public service would count as a form of repayment and should be encouraged. Localise school taxation and expenditure so that the cost and benefits are better understood locally. Low income groups should have sufficient subsidies to permit them to overcome the private costs of schooling;

iii) Ensure that artificial wage differentials for different occupations are rapidly narrowed;

iv) Establish a Commission of the producers and consumers of formal education to mesure and review the inefficiencies at each level and propose a strategy for innovation;

v) Establish cost accounting techniques, initiate educational production function studies, organise human resources planning and management units;

vi) Increase the effectiveness with which the basic cognitive skills are learned and thus reduce the phenomenon of primary schools producing semi literates;

vii) Explore the opportunities of informal education using adults and more advanced students to teach;

viii) Consider the use of automatic promotion from one grade to the next;

ix) De-emphasise the role of examinations for promotion. Eliminate the social class bias of present examination. Add the use of testing of wider range of behavioural skills and;

x) Develop mechanisms to encourage students who dropped out to re-enter the formal system at an older age.

5.24 The existing system of higher educational institutions for technology and science including universities needs a thorough probe with a view to make it more purposeful, relevant and functional. A national science and technology policy will have to be formulated giving importance to administrative autonomy and academic freedom with a view to attract scientists of eminence to man Centres of Excellence in the different areas of Science and Technology. A mass campaign for the eradication of illiteracy will have to be launched.

Art and Culture

5.25 Education must foster the pride that this large country of ours is inhabited by hundreds of small and large nationalities each with its specific culture, art and music and language making India one of the largest contributors to the culture and civilisation of mankind. Yet this diversity underlines the essential unity of Indian culture. The system should attach very great importance to the full enrichment and development of the cultural and art form of every linguistic and cultural group so that there is an all round growth and revitalisation of the Indian culture. Artists and musicians will have to be given their due place of honour and adequate remuneration for their services will have to be ensured. In the field of sports and gymnastics, we have to cover a long way to reach international standards. We should take urgent drastic steps to reorganise sports and gymnastic activities in the country. We should organise urban and rural gymnasiums and sports stadia covering all the cities, towns and community blocks so that people of all age groups will be drawn into the different forms of sports and games and health building activities. This should help to highten the health and vigil of our men and women enmasse in defence of the country's independence and freedom.

CHAPTER VI

HEALTH AND NUTRITION

Health

More than one-half of India's population is inadequately nourished and one-third is ill on account of deficiency diseases or communicable diseases. They are thus effectively prevented from participating in the production of goods and services for the society in which they live. Poor nutrition and poor health limit the range of their choice about what they can do with their lives as cruelly as inadequate income. The ill and the under-nourished appear to belong most often to that part of the population who also suffer from such other disabilities as low income, poor education, poor sanitation and poor housing and generally unhealthy living environment. Thus poor health and inadequate nutrition appear as integral parts of "low-end poverty" whose elimination forms a central element in Government of India's social programmes. While it is recognized that increasing the monetary incomes of the poor may be one of the effective ways of ameliorating their health and nutritional status, an increase of income *per se* should certainly not be confused with the end of eliminating sickness, malnutrition and other constituents of the syndrome.

6.2 The Bhore Committee on Health (1946) had rightly observed that "the term health implies more than an absence of sickness in the individual and indicates a state of harmonious functioning of body and mind in relation to his physical and social environment so as to enable him to enjoy life to the fullest extent and to reach his maximum level of productive efficiency". Therefore it was realised from the very beginning that the

the environmental conditions in which people live and work have have a great bearing on their health. Elsewhere we have examined the importance of suitable housing, safe drinking water supply, nutrition and proper disposal of wastes in improving health standards.

6.3 During the last three and a half decades, the mortality rate in India has declined from 27.4 per 1000 in 1949-50 to 13.9 in 1980-81; infant mortality rate has dropped from 146 per 1000 live births in 1950-51 to 114 in 1980-81, and expectation of life at birth has improved from 41 years from 1950-51 to 51 years in 1980-81. As for the medical care and manpower facilities, there is no doubt that the number of hospital beds, doctors, nurses, etc., has grown fast over the years as in Table 6.1. But the growth is less impressive when related to the population. While the number of doctors quadrupled between 1950 to 1981, their number per lakh of population increased from 16.5 to 39.3 i.e., by about 138 per cent. Similarly hospital beds per lakh of population improved from 31 in 1950 to 74 in 1980 - a rise of about 139 per cent. The total number of nurses related to population rose from 4.7 per lakh population in 1950-51 to 22 per lakh of population in 1980-81. The medical and health care services in India is still very inadequate and whatever there exists is unevenly distributed between urban and rural areas. Even the para medical staff is hopelessly inadequate in India. Thus an auxiliary nurse-midwife has a population of 10-15 thousand in which she is expected to provide maternity services along with anti-natal and post-natal care, child health care as well as family planning extension work. The various communicable and infectious

Table 6.1

Health Services : 1951-1982

(Number)

Year	Registered Doctors		Hospi-	Dispen-	Beds(a)	
	Total	Per lakh population	tals	saries	('000)	Per lakh population
1950	59,338	16 5	2,717	6,891	112	31
1955	70,152	18 0	3,094	7,100	146	36
1960	75,959	17 6	5,011	9,874	200	46
1965	99,779	20 7	3,900	9,486	295	61
1970	138,744	25 8	4,239	10,508	326	60
1971	148,522	27.1	3,862	12,180	349	64
1972	160,028	28 6	3,841	10,372	379	68
1973	172,355	30.1	3,855	11,985	391	68
1974	184,960	31.6	4,014	10,200	402	69
1975	197,650	33.0	4,023	11,295	404	68
1976	210,504	34.4	4,465	11,696	449	74
1977	223,387	35.7	5,445	12,656	494	79
1978	235,631	36.8	5,815	14,828	523	82
1979	249,752	38.2	6,625	15,599	554	85
1980	255,138	38.2	6,670(b)	15968(b)	494(b)	74
1981	268,712	39.3	6,805(c)	16754(c)	505(c)	74
1982	295,099	42.1	6,901(d)	17455(d)	517(d)	74

Notes:-

(a) Includes all types of beds in hospitals, dispensaries and voluntary organisations etc.

(b) Relates to Ist January 1981

(c) Relates to Ist January 1982

(d) Relates to Ist January 1983

Source:- Basic Statistics Relating to the Indian Economy, Vol.I, 1985, CMIE

diseases still remain the major cause of mortality in the country as the preventive services are yet far from adequate. Nearly 1.20 lakh villages with a population of 65 million still do not have even the most elementary water-supply system. Most medium and smaller towns have no sewerage system. In the rural areas the implementation of proper sewerage and drainage system has hardly begun.

6.4 It is a matterof concern that in the process of qualitative expansion of health care services, adequate attention has not been paid towards the quality of services rendered, as a large number of primary health centres have been established without ensuring availability of essential physical facilities, equipment and trained personnel. The National Health Policy cannot be achieved unless quantitative improvement of the services goes hand in hand with expansion of the infrastructure. The National Policy on health should insist that greater emphasis should be placed to promotive and preventive aspects of health care in an integrated approach from the primary health centre and sub-centre upwards. Reorganisation and integration at various levels should lead to a complete integration of the organisational set up for health and family planning activities and unity of command at the district, the state and the central level. The present set up is not conducive to efficient use and management of resources.

6.5 To reach even the minimum standards of health services - now existing in developed countries by 2000 A.D., India should aim at 100 doctors, 250 nurses and 750 hospital beds per lakh of population. This would mean that the nuber of doctors should rise to over a million,d the number of nurses to 3 million and hospital beds to 10 million. To match this level of services we may have to increase the number of Primary Health Centres several fold so that the Primary Health Centre with a 100 bedded hospital attached to it can serve a population of about 25,000, whereas a sub-centre can take up a population of 5000. Only then can medical and hospital care facilities reach Indian villages. This is a stupendous task. In our integrated planning approach this will have to be seen along with the need to supply protected water and sewerage. The costs of providing these facilities alone to a population of 972 million in 2000 A.D. will be more than Rs.10,000 crores.

6.6 Apart from the huge financial costs involved, the production of doctors, nurses and para-medical personnel in the required numbers will call for large organisational and managerial expertise. Presently we have only 100 medical colleges with a total admission capacity of about 14,000 a year. To achieve the target we may have to increase this number to 1000 medical colleges with an admission capacity 50,000 a year during the next 15 years. Another difficulty is that well qualified doctors usually prefer to serve only in urban areas while the need for them is more in the rural areas. It is indeed ironical that "whereas a doctor is said to be a leader of a team consisting of nursing and para-medical

staff, no training is imparted to him to enable him to discharge such a function. Throughout his undergraduate career not a single hour is devoted to develop managerial skills and other duties experted of a leader". He is, therefore, not a multi-purpose worker and these deficiencies in the training are more responsible for his disinclination to work in villages rather than lack of physical and social amenities. Even the medical education that he receives has hardly any relationship to the living environment in which he would be required to work.

6.7 The recent policy of the Government is to encourage also non-allopathic systems of medicine. At present there are about 180 hospitals, 115 colleges and 9000 dispensaries of the indigenous and homoeopathic systems of medicine in the country. About 60 per cent of them work in rural areas. Unfortunately, very few of them have institutional training; most of them have learnt their trades in the family. This is also true of the para medical staff. More than the doctors, therefore, it would be necessary to rely on health workers and para medical staff to immediately fill the gap in service requirements in the country side. With a little more generalised training, these health workers could become effective agents of change in rural areas to improve health and hygienic standards. Unfortunately, the present health and family planning workers are not trained to provide remedies even for simple ailments like cuts and burns or other minor ailments. In these areas, perhaps India could learn from the experience of the Peoples' Republic of China. Their "barefoot doctors" recruited at each locality live and work

in their own communities. They are taught to give first aid, supervise immunisation and oversee refuse and excreta disposal. In China, health services are labour intensive, and traditional techniques are skillfully combined with modern ones to extract the largest gross medical product out of the available resources and skills. The barefoot doctors and mid-wives are the primary source of health education. They are supervised by trained physicians. In this system, most farmers are able to obtain services at moderate costs. If one could learn from the Chinese experience in this matter, our multi-purpose workers should be fully equipped for the delivery of health, family planning and nutrition services. The present basic health workers and para-medical staff should be gradually converted into multi-purpose workers in a phased manner after appropriate orientation and intensive training.

6.8 The preventive health services should be built around the existing infrastructure of curative medicine. Unfortunately, the British developed only a system of curative allopathic medicine in India. Immediately after independence we should have changed into an integrated national system (as was done in China and in various other countries) with positive emphasis on preventive medicine and other parameters of positive health. Indeed, we underlined the curative aspect of the health care delivery system, so that today we have quite a large number of expert doctors and hospitals engaged in medical dramatics in the socalled pinnacles of medical specialities with hardly any effort being made in the mundane but vital areas of mass immunisation, potable water

supply, provision of sanitary latrines, maternal and child health care, nutritional support, breast feeding and a host of other areas. We tend to consider curative medicine as an end in itself, whereas it should only be a means to an end, the end being positive health of the people built on the firm foundation of preventive medicine.

6.9 In many cases States like Kerala offer a typical case study of a situation in which diseases are created so that ultimately they may be cured. This was what was forecast by Bernard Shaw in his Doctor's Dilemma. Any number of examples can be given. Day in and day out, our media and our society encourage youngsters to smoke. With the influx of money (and costly cigarettes) from the Gulf areas, cigarette smoking has become a *sine qua non* on youth power. We have incontrovertible evidence to show that cigarette smoking is the prime, if not the sole, cause of lung cancer and various heart disorders. The warning that "Cigarette smoking is injurious to health" is taken as the biggest joke of the decade. While most of the Western countries show a decline in cigarette consumption, it is on the increase in India and it is believed that Kerala consumes a lion's share of cigarettes produced in India - 16 per cent - now that the less dangerous beedi has gone out of vogue. In any case, what we are doing is to encourage people to smoke cigarettes, to get cancer of the lung, and to build big cancer centres and do dramatic surgeries like lung resection, or do C.T. scanning or use sophisticated and terribly costly western produced instruments for the diagnosis and treatment of such diseases. The same may be said of drinking and cerrohosis or kidney disease and consequent dialysis or of badly maintained roads and vehicles and of accidents

and various other situations. In fact, the entire system is so full of these paradoxes that any analysis will show the highly devious path we have been treading.

6.10 Unless the emphasis is shifted from hospital based curative medicine to preventive medicine, the sanitary improvements, nutritional support, etc., we are not likely to achieve our objective of giving positive health to our people. For this, curative medicine has to be demystified and the entire curriculum and training of doctors have to be reoriented. Our common people must be made to understand that "All that glitters is not gold" and that health care is more of a socio-economic problem which has to be primarily looked after by the people themselves rather than left to doctors.

6.11 For this the immediate plan should be to set up in every State a preventive medicine department. The Health Services Departments in many States used to have two wings, preventive and curative and it was only in recent years that it was abolished as it was not possible to attract good doctors to this wing. Such departments do exist in some States. Even now it will be difficult to get the proper personnel for this work. However it looks as if the experiment would succeed if effort is made by making it more of multidisciplinary department, by having sanitary and public health engineers, water supply specialists, nutritionists, sociologists and health educators in the preventive wing. In fact a massive health education programme should be launched so that

the common man gets educated in all the manifold facts of health care activities and is enthused to contribute his active help and co-operation in the endeavour as an active partner. In other words what is needed is a shift in the emphasis of health care activities to make it comprehensive and preventive rather than curative. A new philosophy of positive health as a peoples' programme must be evolved.

6.12 Over the years, the multinational companies have been fleecing the public by drugging them. It is sad to state that the medical profession as a whole has not actively prevented this. Any number of examples can be cited. The W.H.O. and its Director General, Dr.Mahler, has declared time and again that less than 200 preparations alone are necessary to safeguard the health of the public. The Hathi Committee also has made a similar recommendation. But unfortunately there are more than 45,000 preparations in the Indian market. Many of them are only duplications and combination of no special value. Exhorbitantly high rates are charged for these drugs. To give an example: Analgin is a U.S.S.R. pharmacopoeia drug and the one and the same chemical compound is sold under different brand names starting from A to Z and some of these preparations are thrice as costly as Analgin. It was proposed to market the drug under the genetic names. But this has been shelved because of the pressure from the lobbies of these firms. Even in the Government hospitals, there is no medical vocabulary in existence causing, indiscriminate buying of costly drugs of dubious value when infinitely cheaper substitutes of equal value are readily available.

6.13 The story of infant foods sale in India is a standing disgrace and is a glowing example of open exploitation of the gullible public. While various developed countries have banned the sales of toned milk as infant food (they can be sold only as modified milk products), we not only allow its indiscriminate sale, but even permit the companies to advertise these in such a way as to make it apper as if it is superior to breast milk. The practical disappearance of breast feeding in our cities at one stage was the direct impact of this malicious propaganda. It is heartening that moves are afoot to reverse this trend.

6.14 We can go on increasing these examples *ad nauseam*. In any case the whole mistake was in the lack of planning and the absence of a philosophy of preventive need.

Nutrition

6.15 Normal human growth and performance require a diet adequate in calories (units of energy produced by carbohydrates, fats and oils and starches), proteins (found in high concentration in meat, fish, eggs and pulses) and vitamins and minerals (Vitamin A, B & C). More than half of the indian population is inadequately nourished. Their inadequate nutrition and poor health effectively prevent them from actively participating in the production process. The lack of calories seems to be more severe than that of protein. Vitamins and minerals are also being consumed in quantities for less than adequate. India's levels of intake appear to be among the world's lowest.

6.16 The average daily calorie intake as recommended by the Indian Council of Medical Research is 2400 (a weighted average for all age groups) and the mean intake is around 2000 calories which is around 20% below the recommended minimum. The calorie intakes are distributed more or less unevenly among different social strata and regions resulting in 50% of the population receiving fewer calories than the mean. We may note therefore that the relevant figure for policy purposes is not the average but the number of people or the proportion of the total population not getting enough to eat. On this basis more than 51% of the rural population and 70% of the urban population receive inadequate calories. A substantial proportion of the Indian population (33%) does not receive adequate protein. In the case of those who receive adequate protein a substantial portion again does not get adequate calorie. In their case a portion of the protein consumed by them is 'burned' to provide energy so that their net amount of protein remaining for tissue formation becomes significantly below the amount required for optimal level of it.

6.17 Protein - calorie malnutrition is three times as prevalent in the rural parts of Southern and Eastern India as in the rural areas of the North and West (Dandekar and Rath). The National Institute of Nutrition study (Dr.Gopalan, Diet Atlas) has confirmed the same pattern of regional differential in calorie consumption. The areas with a relatively low and inadequate protein calorie nutrition correspond roughly with India's rice growing areas and agriculturally depressed areas.

6.18 The urban dwellers appear to eat significantly less well than the rural population in the relatively well nourished North-West. In the South and East the urban and rural populations eat about equally poorly. Poor people are simultaneously ill-nourished. Many diet surveys conducted in India have shown that more than one-half of the families with a monthly income of Rs.500 per month receive inadequate calories with 25% of them receiving insufficient protein as well. Also the special groups like children, pregnant women and nursing monthers are worse off nutritionally than the segments of population to which they belong. The pregnant women needs 15% more calories and 25% more protein than the non-pregnant counterpart. The nursing mother also needs one-third more calorie and protein than others. The growing child requires around two-thirds more protein and calorie per kg. of weight than his mother or father. But, idn practice those who need more balanced food are not getting it. The result is the average Indian child of 1 to 5 years old has only an average daily calorie intake of 810 compared to 1200 recommended by the ICMR. The average vitamin-A intake is just over 60 milligrams daily compared with the 300 recommended. Average vitamin-C consumption is only 4 milligram relating to the needed 30, iron intake is 6 mg. in the place of 20 recommended; calcium is just under 20 mg. compared to the 500 recommended (S.G.Srikantia, 1973). These figures suggest that 80% of the Indian children receive inadequate amounts of key vitamins, minerals, calories and proteins. Nearly 80% of the pregnant Indian women and nursing mothers are receiving inadequate calories and proteins.

6.19 The poorly nourished child grows less rapidly. His weight and height is also much less than what he should weigh at his age. About 80% of the Indian children belonging to low income group weigh less than 75% of what they should. He also develops less well mentally and performs less intellectually than adequately nourished children. These deficiencies also get aggravated by differences in the home environment. He will grow up as physically small, frequently ill and poorly nourished adult who will be less capable of delivering the same amount of physical labour. Hector Correa has estimated that malnutrition is depriving India of some 50% of the physical capacity of her labour force.

6.20 Inadequate nutrition is thus intimately linked with health and other elements of the poverty syndrome. It is obvious therefore that India should increase her agricultural production in respect of foodgrains, pulses, milk and meat, eggs and vegetables significantly if India's population is to eat adequately well. Given the present maldistribution of income and widening income differential, the ability of the now income groups who need better nutrition to buy food, will not increase even if the availability of food increases. There is also the question of the crop mix. The higher productivity of the high yielding cereal varieties makes them more attractive financially to farmers than traditional high-protein crop such as pulses resulting in a decline in the overall protein production. In the circumstances we have to adopt a development strategy which will increase the incomes of those who need more food and that

the increased incomes will simultaneously lead to better nutrition. The anti-poverty programmes conceived by the Government of India, therefore, assumes crucial importance.

6.21 One-third of India's households would need atleast thrice their current incomes to attain an adequate diet on the basis of rising earnings alone. Even on the optimistic assumption of a 3% yearly rise in the per capita real income it will take another 50 years for one-third of the household to reach the required level. It would also require the State to plan for a rapid reach dsof production of the kinds of food consumed by the low income strata in an effort to keep the prices low within the framework of a food procurement and distribution system directed towards low income groups. As part of the drought relief or food for employment programme it should be possible to build up a massive organisational infrastructure of fair price shops to provide nutritious food to the poor segments of the society on a permanent basis. There are constraints like the priorities in the family sharing of available food that go to prefer earning members of the family and neglect of those not old enough to contribute. In the circumstances it becomes necessary to reach the food directly to the individual who need it most through measures like mid-day meal programmes for children and feeding programmes for pregnant and lactating mothers. Government sponsored meal programmes today reach about 200,000 people daily which is a remarkable achievement. The outlay on nutrition programme has been increasing from Plan to Plan (see Table 6.2 and 6.3).

Table 6.2

Per Capita Availability of Essential Commodities

Commodities	1950-51	1965-66	1968-69	1976-77	1978-79	1979-80	1984-85
Foodgrains (Gms/day)	395	408	445	437	475	411	471(b)
Cereals (Gms/day)	334	360	398	398	430	380	430(b)
Pulses (Gms/day)	61	48	47	44	45	31	41(b)
Edible oils and Vanaspati (Kg/year)	3.1	3.5	3.5	4.1	4.8	4.7	6.4(b)
Milk*(Kg/year)	46.8	38.9	37.4	40.5	44.1	44.8	49.2(b)
Fish (Kg/year)	1.5	2.4	2.6	3.3	3.1	3.2	3.6(b)
Banana&Papaya(Kg/year)	6.1	7.0	6.3	6.3	7.6	7.5	7.5(b)
Potato,Sweet potato & Tapioca (Kg/year)	10.3	17.3	21.6	23.9	27.0	23.0	24.4(b)
Sugar,Gur,etc.(Kg)*	12.4	18.5	17.7	19.2	19.2	20.4	22.6(a)(b)
Tea (Grams)*	197	277	311	316	346	352	512(a)(b)
Fabrics(Metres)**$	11.0(d)	16.0	15.5	15.3	16.3	17.4	16.7(e)

(a) Relates to 1983-84; (b) CMIE estimates; (d) Relates to 1951 (e) Relates to 1983; *On five year moving average; **On three year moving average; $Figures for calender year e.g. 1950-51 = 1950.

Table 6.3

Outlay on Nutrition During Five Year Plans

(Rs. crores)

Sector	First Plan 1951-56	Second Plan 1956-61	Third Plan 1961-66	Fourth Plan 1969-74	Fifth Plan 1974-79	Sixth Plan 1980-85	Seventh Plan 1985-90
Central Schemes	20.2	5.0	7.0	38.08	14.50	13.95	7.32
Centrally Sponsored Schemes					12.99	1.00	...
States				7.10	84.94	214.55	1693.86
Union Territories					3.24	8.64	39.00
Total	20.2*	5.0*	7.0*	45.18	115.67	238.14	1740.18

*Outlay for nutrition has been separately earmarked only since the Fourth Plan. Prior to that the outlay was for "Public Health Servicesincluding Maternal and Child Welfare, Health Education and Nutrition".

Source:- Five Year Plan Documents, Planning Commission.

6.22 Many Government agencies and departments are engaged in running one nutrition programme or the other like the Mid-day Meal Programme, Applied Nutrition Programme, Special Nutrition Programme, Integrated Child Case Service etc. Many of the evaluation studies of the feeding programmes made by the State Governments show that there is much to be desired in the matter of the reliability of the estimates of the beneficiaries covered, the regularity, quantity and quality of food supplied, and the impact of these programmes on the nutrition levels of the target groups. The basic weakness of the foregoing programmes is that they are essentially food supplementation schemes. As reiterated by the Planning Commission from time to time, more supply of free or subsidised food, without increasing food production and income level, will not make a perceptible dent on the nutrition status of the vulnerable groups. Further, a programme dependent on food aids from outside the country does not seem to be a viable or desirable option. The manner of implementation of these programmes through a multiplicity of Government Departments involving overlapping of target groups also leaves very much to be desired.

6.23 For the last 200 years or more, our culture has been dominated by the Cartesian-Newtonic view of man as a machine to be analysed in terms of its parts. The mind is separated from the body, disease is seen as a malfunctioning of the biological mechanism and health is defined as absence of disease. This is largely diametrically opposite to the traditional systems of medicine like Ayurveda and Unani which emphasises the inter-relatedness and inter-dependence of

phenomena in terms of its underlying dynamic processes. It is similar to the modern system's view of living organisms which can provide the ideal basis for a new approach to health and health care which at the same time is routed in our cultural heritage. This view of health and health care is ecological which at the same time takes into account the spiritual dimensions of health and is in harmony with our spiritual traditions.

6.24 This system's concept of health implies continual activity and change reflecting the organism's creative response to environmental challenges. Since a person's condition will always depend on the natural and social environment, there can be no absolute level of health independent on this environment. This view of health and illness implies a number of guidelines for health care which will sketch out the basic framework for a new holistic approach. We should therefore, consider the interdependence of our individual health and that of the social and ecological systems; health care in such a context will consist of restoring and maintaining the dynamic balance of individuals, families and other social groups. Health care at all levels, will consist of balancing and resolving stressful situations in individual and social action. If this view of medical care is accepted, it has to be based on a comprehensive, effective and well integrated system of preventive medicine. This kind of preventive health care, has been neglected in our society and therefore, we have to build a new powerful grassroot movement promoting health giving habits - physical exercise,

relaxation, meditation and sleep - which emphasise personal and social responsibility for health. Health education and health policies have to be persuaded in close co-ordination. The aim of health education will be to make people understand how their behaviour and their environment affect their health. Comprehensive programme of health education with its emphasis has to be integrated into our school system and given central importance. This may be accompanied by public health education through the media to counteract the defects of advertising of unhealthy products and life styles.

6.25 The existing system is to be overhauled in consonance with the new approach. It is long term exercise and will take time. During the transition period, care will be taken to see that curative side will be maintained with optimum efficiency.

CHAPTER VII

H O U S I N G

India is facing an impossible task in the field of housing, the magnitude of which can only be imagined. More than filling the gap between the number of housing units existing and the nuber needed, it is also a problem of replacing existing units which are in the nature of remshackle and dilapidated structures unfit for human habitation. Two-thirds of the population of Calcutta live in hovels and shacks. A minimum of 6 per cent of the population of Bombay city live on the pavements and another 6 per cent live in the most deplorable and unhygienic slums. More than 1/10 of the population of Madras are slum-dwellers. Only 30 per cent of the existing houses in Calcutta have separate latrines and only 10 per cent had independent water supply. On the whole, only 38 per cent of the urban population in India have swerage facilities. Nearly 125,000 villages with a population of about 70 million do not have even the most elementary water supply.

7.2 While an estimated minimum of 80 houses per 1000 population are added during each decade in developed countries, India adds only 20 houses per 1000 people. The Census figures (1981) show that the usable housing stock was of the magnitude of 70 million units in rural areas and 18 million units in urban areas. It is seen that the average annual increase in the nuber of houses was about 15 lakhs during 1961-81. It is also reported that about 25% of the houses in rural areas and 15% in urban areas need to be demolished or replaced. According to the Census data the total number of households were about 100 million of which 80 million were rural and 20 million were

urban. The housing shortage defined as shortfall between number of households and usable housing stock was, therefore, about 8 million units rural and 4 million units urban. Taking into account all potential housing eligible for demolition and replacement, the real shortage is in the order of about 27.5 million units rural and 7.5 million units urban, i.e., a total of 35 million units. It may be noted that this is the number of houses to be added over and above the normal addition of houses at the past rate. Therefore if the problem of house shortage is to be solved by 2000 A.D. the average number of houses to be built will be 5 million houses per year.

7.3 Considering the need to clear the backlog and to replace houses as they approach the age of demolition, houses will have to be constructed in future at an average rate of about 8 to 10 millions per year. Further, the anticipated growth in urbanisation will give a new dimension to the housing problems of congestion, land speculation, and health and sanitation. Some constraints which will directly affect the supply of housing will be the high cost of suitable sites, building materials and high interests rates on building loans. In this social climate, private investors will have no incentive to build houses for the low income groups and consequently few low-cost buildings will be built. In rural areas, additional constraints will be the considerable logistic difficulties in transporting building materials such as usable roads and feeder tracks. In water logged areas this will be a

formidable obstacle which could be overcome in the short run only by evolving building designs oriented towards the use of locally available materials.

7.4 Admittedly what is called for is "bold, imaginative, unorthodox thinking and action". The current establishment view is that the country will require about Rs.40,000 crores at current prices to provide the minimum housing according to P.W.D. standards and therefore, the problem is dismissed as impossible, without any regard for the long term consequences of inaction. We start off with a pre-conceived notion of how much a house would cost to build, and on discovering that this cost exceeds the paying capacity of the average households, it is concluded that nothing can be done. An alternative approach will be to design a structure that will fit in with the community's capacity to pay. At our existing low levels of income the capacity of the average household to pay rent will depend upon the per capita income of the population and on its distribution. The pattern of income distribution itself will vary from region to region and sector to sector. Granting that the per capita incomes will rise noticeably in the next two decades and will be accompanied by a more equitable distribution, it should be possible to work out the average household propensities to spend on housing. It is in this context, that Government should device schemes for different income groups whereby houses are constructed for them by the Government or Government approved agencies. The money spent will have to be recovered from the beneficiaries in monthly instalments over a specified period at the end of which the

house would automatically become the property dof the allottee. The recent Kerala experience would show that it is possible to translate such a scheme into a concentrate plan of action if it is tackled with determination and in a co-ordinated mannuer and with people's participation.

7.5 Reduction of the cost of construction of houses should attract the attention of our Engineers and Technologists. Blind adoption of the bookish knowledge based on conditions prevailing in advanced countries on their part is a tendency that stands in the way of bringing about changes and innovations on this front as on many others. It is a challenging job requiring a high degree of imagination and expertise to design low cost houses which combine beauty, minimum living space, strength and security along with simplicity. A country like India with wide diversity of people and environments, one or two designs of such houses will not meet the need. It is imperative to maintain considerable diversity in the design to relieve monotony, to allow for the climate and other special features of different regions and to make use of the housing materials available in the different parts of the country so as to minimise cost of construction. Changes in designs which would increase the part of labour in our construction process, would be most desirable in the case of poor sections who could contribute their labour and thus bring down the cost of construction.

7.6 It is considered, therefore, necessary to evolve a socially relevant and economically feasible policy in the field of housing and construction activities in general. Such a directional

policy framework may be evolved on the basis of examination and assessment of different methods available today for lowering the cost of construction of residential houses utilising to the maximum extent locally available construction material. Possible methods of lowering cost of construction should be applied to Government buildings, office buildings, schools, hospitals and similar public institutions. This would also involve a critical examination of the present organisation of building industry with a view to suggest new training programmes, standardisation of materials, designs and provision of finance.

7.7 Our most impregnable barrier in the way of change has been the inherently conservative attitude derived from an almost sentimental attachment to "works" - an obselete British concept. Our construction enterprise has continuously been dominated by a P.W.D. approach by architects and town planners born and bred in the Establishment, who are incapable of seeing the need for innovation and updated expertise. For the last 100 years, the National Building Code determined invariably the design, standards and specifications which explained our corrosive rigidity of thinking in the sphere of building techniques. There has been little awareness of the need to reduce costs by using ingenuity and innovative methods by experimenting with new ideas, by improving technical knowledge and by proper integrated planning. The dwelling place should be simple, inexpensive and functionally satisfying. Unless such a review is taken today and decisions taken well ahead of the 7th Plan, we will not be able to undertake any large scale low cost construction. A lot of the existing build-

ing norms like the P.W.D. code and administrative procedures will have to be modified in the light of new methods and programmes

7.8 Reducing cost of construction is not merely a matter of planning and scientific design, but one of looking at the institutional problems involved in methods of construction A number of research laboratories have been working in this field for a long time and have brought forward many valuable suggestions In Kerala, Mr L.W.Baker and his many experimentation have helped to revolutionist thinking in this field. Unfortunately the general impact of those recommendations on the Government has been minimal. This is largely due to planned resistance from vested interests together with a degree of laziness and tradition boundedness of our designers and builders The Government agencies follow practices which provide no incentive for introducing change or innovation in existing practices. A vicious circle exists in which over designing allows for shoddy and inaccurate work together with opportunities for stealing materials which in turn justifies over designing. Such a vicious circle must be broken. The private construction industry works for those who can afford to pay and the designers and builders get paid on a percentage basis, moreover, many rich clients want their houses to be ostentatious for, this gives them "status". Such ostentatious houses have increased the price of housing beyond the reach of every one else. Even the middle classes are prone to borrow this value in order to keep up with their wealthier neighbours. This prevailing tendency towards waste of resources should convince us that the time has come for a strong campaign

towards simple and comparatively less prestigious building for all. Low cost housing should not be conceived only for the poor. Rethinking and redesigning must start at the top and spread through all strata of society.

7.9 If an ambitious housing programme is launched at the national level on the lines indicated above, it will also go a long way in solving the problem of unemployment in the country. As stated earlier the number of houses to be built per year would be 8 million which will mean an investment of Rs.4000 crores per year. If a labour intensive technology is adopted, about two-thirds of the amount (Rs.2600 crores) would be wages of labour. About 10 million workers can be employed for the whole year with this amount. Thus the housing programme is particularly relevant in the context of the Government of India's full employment goal.

7.10 Investment of a high order on housing will further lead to the expansion of a number of ancillary industries like bricks and tiles, surki-lime, cement and timber industry. Thus the direct and indirect employment potential of the housing programme is very high. This does not mean that the whole investment for the programme should come from the public sector. Private investment

should play a major role in its implementation. This is an area where the co-operative organisations can play a decisive role. The importance of the programme would justify the housing co-operatives being given the same treatment as agricultural co-operatives by the Reserve Bank and the Government of India.

CHAPTER VIII

URBAN DEVELOPMENT

According to the 1981 Census, the urban population in India is about 160 million. In 30 years, the level of urbanisation has increased from 17 per cent in 1951 to about 23 7% in 1981 (Table 8 1)

Table 8.1

Growth of Urban Population in India[1]

1901 - 1981

Census year	No.of towns[2]	Total Urban Population (in million)	Population in towns above 20,000 (in m)	Level of urbanisation[3]	Annual growth rate of total urban population (% per year)	Annual Growth rate of rural population (% per year)	URGD[4] (Col.6 - Col 7)	Annual growth rate of population in towns above 20,000 (% per year)
1901	1834	25.6	13.5	11.0	..	..	..	..
1911	1776	25.6	13.8	10.4	0.00	0.61	(-)0.61	0.22
1921	1920	27.7	15.5	11.3	0.79	(-)0.18	0.97	1.16
1931	2049	33.0	19.6	12.2	1.77	0.94	0.83	2.37
1941	2210	43.6	28.7	14.1	2.82	1.11	1.71	3.90
1951	2044	61.6	43.2	17.6	3.52	0.82	2.70	4.17
1961	2330	77.6	61.4	18.3	2.34	1.88	0.46	3.58
1971	2531	107	89.6	20.2	3.26	1.97	1.29	3.85
1981	3245	156	134.9	23.7	3.86	1.75	2.11	4.18

Notes:- 1. Excluding Assam and Jammu & Kashmir

= million

2. Constituent towns of urban agglomerarations are not counted as separate units

3.Proportion of urban to total population

4. Urban-rural growth differential

Source: Census of India 1981 - Provisional Population Total Series I - Paper 2 of 1981.

It is not high compared to the rest of the world. However in absolute terms India's urban population increased by about 50 million people during the last decade (1971-81). It is expected that the total population of India will be 860 million in 1991 and 1020 million in 2001. The level of urbanisation in these years will be 28 per cent and 32 per cent respectively. This would mean an urban population of 235 million in 1991 and 320 million in 2001. (Table 8.2).

8.2 It is expected that the net additions to the urban labour force is increasing by 14 million in 1981-86 and 20 million in 1996-2001 whereas the net addition to rural labour force is expected in the region of 22 million in every 5 years. This would mean we have to create about 3 million jobs in the urban areas annually. There should also be provision of services and infrastructure which can remove constraints to growth to production sectors. These problems were sought to be achieved through the development of "Integrated Urban Development Programme" and "Integrated Development of Small and Medium Towns". Unfortunately the achievement in this area was not quite satisfactory. Often the physical and investment plans were not dovetailed at the regional level and State level plans. At present there is little interaction between the city Government and the State Government. What is, therefore, needed is community level institution-building whereby the needs of the society can be expressed in an organised manner within the planning process by providing the inter-linkages between different parts of the economy. Large projects generating direct employment to over 1000

persons should be required to work out its "urban impact" statements which should include obvious implications of each project on employment, basic services, social amenities, communication net work, housing, water supply etc. The responsibilities thus cast on the planning machinery at the State level would call for the development of a strong technical team on town and country planning with necessary capabilities and authority. They should be responsible for investment planning and urban development. It should be inter-disciplinary in character. Enforcement of standards, urban regulations and physical land use plans etc. should be made their statutory functions.

8.3 Decentralisation of industry has been an explicit aim of our Government for a long time. Yet extensive decentralisation as planned for has not taken place. There is no evidence of a shift of industry from the larger cities to smaller towns for India as a whole. The National Committee on the Development of Backward Areas has identified 100 centres as growth centres which should be provided with full physical infrastructural facilities. It may be necessary also to identify some more growth centres in each State within the context of the industrial dispersal plan. Variations between States are large in the matter of the growth rate of urbanisation (Table 8.3). Assam and Kerala are excluded for different reasons. The Census could not be conducted in Assam due to disturbed conditions in the State. In Kerala 95 per cent of the population live in villages of over 5000 people and would qualify for classification as urban settlements. Industrialised States of Maharashtra, Gujarat

Table 8.2

Annual Growth Rate of Urban Population by Size of Town 1971-1981

Size Class	No. of towns 1971 [9]	Total Population 1971 (in '000) [7]	Total Population 1981 (in '000) [8]	Growth rate [6] % per year	% over decade
Class I (1 lakh & above)	145[1]	60,122	85,801	3.62	42.7
Class II (50,000 to 100,000)	178[2]	12,030	16,874	3.44	40.3
Class III (20,000 to 50,000)	560[3]	17,170	23,712	3.28	38.1
Class IV (10,000 to 20,000)	818[4]	11,656	16,107	3.29	38.2
Class V (5,000 to 10,000)	596[5]	4,300	6,264	3.83	45.6
Total	2297	105,278	148,758	3.52	41.3

Notes: 1/ Excluding Srinagar, Gauhati and Jammu (Total 1971 Population 0.78 million)

2/ Excluding Dibrugarh, Jorhat, Nowgong, Tinsukia and Silchar (Total 1971 population 0.32 million)

3/ Excluding 22 towns - 3 in Assam, 3 in Jammu and Kashmir, 15 in Kerala and 1 in Punjab (Total 1971 population 0.63 mil.)

4/ Excluding 56 towns - 24 in Assam, 3 in Jammu and Kashmir, 15 in Kerala, 5 in Tamil Nadu, 3 in Karnataka, 3 in Maharashtra and 1 each in Haryana, Bihar and Andhra Pradesh.

5/ Excluding 83 towns - 23 in Assam, 15 in Jammu and Kashmir 7 in Kerala, 6 in Gujarat, 4 in Maharashtra, 3 in West Bengal, 6 in Tamil Nadu, 3 in Madhya Pradesh, 3 in Karnataka, 2 in Uttar Pradesh and 1 each in Andhra Pradesh, Orissa, Punjab and Haryana.

6/ The growth rates are calculated by comparing the total population of towns in each size class according to their classification in the 1971 Census and compared with the total population in the 1981 Census, e.g., the growth rate of 3.62 per cent per year for Class I towns in 1971 refers to the growth between 1971 and 1981 of the 145 towns classified in Class-I in 1971.

7/ Source:- Government of India: Census of India, General Population Tables - 1971-Series I, Part II,New Delhi 1975

8/ Government of India; Census of India - Provisional Population Tables - Paper 2 of 1981, New Delhi 1981.

9/ The various towns excluded in Class III, IV and V were those that could not be traced in the 1981 Census. These missing towns are either declassified or amalgamated into larger units.

Table 8 3

Statewise[1/] Growth of Urban Population
1951-1981

(Per cent per year)

State	All towns			Towns above 20,000 only		
	1951-61	1961-71	1971-81	1951-61	1961-71	1971-81
Andhra Pradesh	1 5	2 9	4 0	3 5	3 9	5 0
Bihar	4 1	3 7	4 4	4 8	4 1	5 4
Gujarat	1 8	3 5	3 5	3 6	3 6	4 2
Haryana	3 1	3 1	4 8	4 4	3 9	5 2
Karnataka	1 7	3 1	4 2	3 5	3 8	5 3
Madhya Pradesh	4 0	3 9	4 6	4 6	5 0	4 8
Maharashtra	2 0	3 5	3 4	3 6	4 0	3 8
Orissa	6 5	5 2	5 3	7 4	7 9	6 0
Punjab	2 6	2 3	3 7	3 9	2 6	4 1
Rajasthan	1 1	3 3	4 6	2 8	4 3	5 4
Tamil Nadu	2 1	3 3	2 5	6 1	4 3	2 9
Uttar Pradesh	0 9	2 7	4 9	2 9	2 9	3 9
West Bengal	3 1	2 5	2 8	3 3	2 7	3 1
India[2/]	2 33	3 26	3 85	3 59	3 85	4 18

Notes: 1/ Including all States with total population greater than 10 million in 1971 but excluding Kerala and Assam.

2/ Including all States except Assam and Jammu & Kashmir

and Tamil Nadu and West Bengal are all 30 per cent urbanised The absolute increase in urban population in these States is large only because of their initial levels Therefore, it is safe to conclude that our urbanisation is mostly accretion to existing towns of all sizes, with only small additions of new towns The variations in the experience of the four groups of States is shown in the following table (Table 8 4) The connection between urbanisation and economic development can be clearly understood from the magnitude and pattern of disparity in incomes The co-efficient of variation for per capita income has moved from 0 23 in 1961 to 0 26 in 1971 and 0 33 in 1979 whereas the co-efficient of variation for the level of urbanisation for these same years varied in the opposite direction - 0 37, 0 34 and 0 29 respectively What is disturbing is the trend noticed in the worsening of the disparity over time (Table 8 5)

8 4 For the per capita value added in the factory sector, co-efficient of variation has declined from 0 92 in 1961 to 0 67 in 1971 and 0 62 in 1978. For agricultural productivity, the co-efficient of variation increased from 0.30 in 1961 to 0 59 in1971 and 0.73 in 1981. It is clear, therefore, that the worsening of disparity in state incomes has not been caused by the manufacturing factory sector The three poorest States in 1961 were Bihar, Orissa and Uttar Pradesh. They also have, along with Andhra Pradesh, Madhya Pradesh and Rajasthan a lowest value added in the factory sector. The position is the same even in 1981 (Table 8 6).

8.5 The combined effect of declining share of agriculture and the urbanisation of non-agricultural activity has accentuated the urban-rural

Table 8.4

Urban Growth in States During 1951-1981 - A Summary

Category of States	All Towns	Towns of Population above 20,000 only
I. States where the rate of growth of urban population has increased continuously since 1951-61	Andhra, Karnataka, Rajasthan and Uttar Pradesh	Andhra, Gujarat Karnataka and Rajasthan
II. State where the rate increased between 1951-61 & 1961-71 but declined or remained constant thereafter	Gujarat, Maharashtra and Tamil Nadu	Madhya Pradesh, Maharashtra and Orissa
III. States where the rate declined or remained constant between 1951-61 and 1961-71 but increased thereafter	Bihar, Haryana Madhya Pradesh, Orissa, Punjab, and West Bengal	Bihar, Haryana, Punjab, Uttar Pradesh and West Bengal
IV. States where the rate of growth of urban population has increased continuously since 1951.	None	Tamil Nadu

Table 8.5
Per Capita State Domestic Product

States	Per Capita State NDP (Constant 1970-71 prices)		
	1961	1971	1 9 8 1 *
1. Andhra Pradesh	518	586	678
2. Bihar	390	418	438
3. Gujarat	697	845	884
4. Haryana	627	932	1029
5. Karnataka	559	675	723
6. Kerala	471	636	569
7. Madhya Pradesh	472	489	463
8. Maharashtra	769	811	1008
9. Orissa	392	541	514
10. Punjab	760	1067	1308
11. Rajasthan	500	629	591
12. Tamil Nadu	571	616	682
13. Uttar Pradesh	457	493	524
14. West Bengal	758	729	765
Mean	558	676	727
Co-efficient of variation	0.23	0.26	0.33

* 1978-79 data

Source:- Basic Statistics Relating to the Indian Economy, Vol. II, 1981, CMIE

Table 8.6

Statewise Manufacturing and Agricultural Productivity 1961-1981

State	Value added in Factory Sector (Current Rs. per capita) 1961	1971	1981[1]	Agricultural Productivity (tons per person)[5] 1961[2]	1971[3]	1981[4]
1. Andhra Pradesh	9	29	74	0.88	0.83	1.06
2. Bihar	14	31	57	0.71	0.69	0.67
3. Gujarat	52	108	245	0.59	0.94	0.85
4. Haryana	..	70	169	..	2.77	2.91
5. Karnataka	14	62	107	0.82	1.06	1.13
6. Kerala	17	42	93	0.60	0.50	0.65
7. Madhya Pradesh	8	27	68	1.24	1.26	0.98
8. Maharashtra	69	167	324	0.92	0.65	1.17
9. Orissa	6	27	62	0.98	0.96	0.98
10. Punjab	4[6]	52	136	1.73[6]	3.07	4.36
11. Rajasthan	5	26	56	1.10	1.44	1.05
12. Tamil Nadu	24	75	166	0.90	0.98	1.07
13. Uttar Pradesh	9	24	47	0.85	0.99	0.99
14. West Bengal	60	97	173	0.92	1.11	1.04
Mean	23	60	127	0.94	1.23	1.35
Coefficient of variation	0.92	0.67	0.62	0.30	0.59	0.73

Source: Basic Statistics Relating to the Indian Economy, Vol.II,(CMIE), Bombay, 1981

Notes:- (1) 1977-78 data, (2) Average of 1959-60 to 1961-62, (3) Average of 1970-71 & 1971-72, (4) Average of 1978-79 to 1980-81, (5) Defined as total Foodgrains output in the State divided by totai male agricultural labour, (6) Undivided Punjab.

income disparities. It looks as though labour intensive village based manufacturing is being replaced by more capital intensive urban based manufacturing. The urban employment scene has also undergone changes - rising labour force and a growing unemployment. The urban labour force grew from 40 million in 1972 to 52 million in 1977 and unemployed from 2 million to 3.6 million in the respective years. It is also seen that the long term unemployment was high among the young educated labour force. In future the expansion of the urban labour force will be more rapid as labour force participation rates rise and as urbanisation forces grow in intensity. Thus a very explosive situation is likely to materialise in urban India.

8.6 The following scenario may be attempted in respect of urbanisation from the year 1981 to 2001 as well as the urban and rural population growth during the period.

(1) Level of Urbanisation

1981	1986	1991	1996	2001
23.5	25.57	25.52	29.35	31.04

(2) Urban and Rural Population Projections

(Population in million)

1981		1986		1991		1996		2001	
Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
164	533	198	578	236	620	275	661	320	701

8.7 It is also useful to project the regional distribution in urban population (Table 8.7).

Table 8.7
Regional Distribution of Projected Urban Population 1981-2001

(Population in million)

Sl. No.	Name of the Zone	Year	Total population	Urban population	% Urban
1.	Eastern Zone	1981	177.5	29.5	16.6
		1986	197.1	33.7	17.1
		1991	218.9	39.2	19.9
		1996	238.6	44.3	18.6
		2001	256.8	49.6	19.3
2.	Northern Zone	1981	73.4	16.6	22.2
		1986	83.8	20.4	24.3
		1991	95.7	25.3	26.6
		1996	107.0	31.0	29.0
		2001	118.8	37.4	31.5
3.	Central Zone	1981	169.2	36.3	21.5
		1986	190.0	45.8	24.1
		1991	213.5	57.8	27.1
		1996	234.7	71.1	30.3
		2001	256.4	86.2	33.6
4.	Western Zone	1981	96.9	32.5	33.5
		1986	108.5	38.3	35.3
		1991	121.4	45.5	37.5
		1996	133.0	52.5	39.5
		2001	144.9	60.3	41.6
5.	Southern Zone	1981	166.4	44.6	26.8
		1986	183.5	52.8	28.8
		1991	202.3	62.4	30.8
		1996	218.3	71.4	32.7
		2001	234.2	81.3	34.7

Notes:- (1) Total population of various zones has been projected by using formula

(Contd in next page)

8.8 Within the cities the main concern has been with the increasing number and magnitude of slums. As many as 20% of urban dwellers are living in areas defined as slums and about 20% in squatter settlements. Presently a large scale programme of "Environmental Improvement of Slums" is in progress in the major metropolitan cities. Recently serious concern is noticed at the high increases in the urban land values which is experienced uniformly in all urban centres in India. It was visualised that the Urban Land Celinig and Regulation Act can put a ceiling on urban land ownership on a graduated scale. The idea is to thwart large land owners from undesirable speculation and to bring more land under Government control for development in order to improve its access to to the poor. The control of large amounts of land has, instead led

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$P^t = P^o (1+r)$ Base year population are adjusted for net omission rate for each zone.

% urban obtained by using logistic curve.

Growth differential taken as the same as of 1971-81 for all regions.

(2) Southern Zone - (i) Andhra Pradesh, (ii) Karnatake, (iii) Tamil Nadu, (iv) Kerala, (v) A.N.Islands, (vi) Dadra and Nagar Haveli, (vii) Goa, Daman and Diu, (viii) Lakshadweep and (ix) Pondicherry.

Western Zone - (i) Gujarat, (ii) Maharashtra

Eastern Zone - (i) Orissa, (ii) Bihar, (iii) West Bengal, (iv) Assam, (v) Arunachal Pradesh, (vi) Nagaland, (vii) Manipur, (viii) Tripura, (ix) Mizoram, (x) Meghalaya and (xi) Sikkim.

Central Zone - (i) Uttar Pradesh, (ii) Madhya Pradesh, (iii) Delhi

Northern Zone - (i) Jammu & Kashmir, (ii) (ii) Punjab, (iii) Haryana, (iv) Himachal Pradesh, (v) Chandigarh and (vi) Rajasthan.

to the use of political and money power for preferential access to land at low prices by politicians, bureaucrats and other organised groups. In the prevailing socio-political conditions in India, therefore, the access of the poor to housing and building land is deplorably nil. Nor have the rises in land prices slowed down. Public authorities have often behaved like private monopolists with greater disregard for the needs of the poor and the disadvantaged. These experiments clearly showed the need to orient our policies to an orderly transition from predominantly agricultural and rural society to an increasingly urban one. The State will have to prepare physical land use and other plans on the basis of the identification of key urban employment sectors within specified regions. Planning for urban development in a context where land is the most scarce resource and landless poor are the majority, there is no option before the State except to socialise the entire urban land with at least a hundred year perspective of growth and development.

8.9 At present there is no systematic arrangement to document the actual movement in land prices, and therefore, no scientific conclusions either on the actual pattern of land value increases or on the casual factors underlying such increases are available. Good data on land values would help in the assessment of property taxes, capital gains and the wealth tax. Such fool-proof data collection will also help to reduce the evasion of stamp duties.It will also help to introduce standard land prices.Large tracts of land lying around urban centres can be designated in varying price ranges

and zones and a "standard price" announced for each area in a base year Inflation adjustments can be announced every year along with the other real price rises, that are observed to occur in notified areas. Such a system is more relevant in the development areas than the comparatively backward areas for curbing speculation in land and for bringing land into development at the right prices and at the right time Urban development authorities may be vested with sufficient powers to carry out the price regulatory function without being harassed by political intervention. This would also facilitate land acquisition for development purposes. The approach should be to evolve a built-in method to avoid the legal and other impediments which are closely related to the magnitude and timely payments of compensations involved. Any land acquisition activity will thus have an automatic provision for reasonable compensation which should not be made a matter for litigation.

8.10 Financial requirements of urban development for water supply, sewerage, drainage and sanitation, local roads, waste disposal, area development and urban renewal will continue to increase indefinitely. Unfortunately reliable financial statistics for corporation, municipalities and towns are not available either in the required form or in time. Whatever sketchy information we have about the revenues and expenditures of these bodies shows that there is a relative decline in the development of activities undertaken by the Government despite the fast rate of urbanisation. Plan funds for unban development are spent through a variety of agencies and whatever assets are created are again transferred to these agencies for

maintenance. Necessary non-plan assistance is neither envisaged nor assured and they are not required to levy user charges either. This has resulted in large maintenance gaps for urban public services. The result is that at each successive stage of plan expenditure, the backlog deficit for maintenance goes on increasing. The existing system of devolution of funds to local bodies is adhoc and in the nature of gap filling and therefore, it is thoroughly unsatisfactory for a planned economy like ours.

8.11 In the circumstances, there is need for new institutions to aid orderly and timely investments in urban infrastructure. Ways and means will have to be found through new institution building in this critical area of human welfare to provide incentives as well as control mechanism for local authorities to conserve resources. This necessarily implies judicious selection of low cost technologies and new systems of management which increase the access of urban bodies to capital funds. Loan financing has been a small portion of the total revenues of these self-governing institutions. The situation therefore warrants the creation of specialist facility to deal with the emerging development problems of corporations, towns and metropolitan cities.

CHAPTER IX

SCHEDULED CASTES AND SCHEDULED TRIBES

There exists in society, more so in Indian society, difference in life-chances and life-styles among people. These result from the different positions they occupy in society - as owners of the means of production and exchange or as non-ownership classes of landless labourers or workers in factories. In the same way, differences do exist between those who occupy positions of power and authority at different levels of Government or industrial establishments on the one side and those who happen to be unemployed on the other. In a traditional society like India, there is super-imposed on the social and economic stratification, innumerable levels of fragmentation and fractures implicit in the caste system - the extremes being the Brahmins and the Harijans.

9.2 In this chapter, our primary concern is to study inequality in the Indian society within its structural phenomena such as caste, class, status and power. In the Indian traditional society, individuals are born into a particular stratum and they remain members of its hierarchical structure for the rest of their lives. In practice much of what they do or can do in life will depend on the hierarchical level to which they belong. This situation makes inequality a social fact which cannot be changed effectively by mere individual decisions. This, therefore, makes it imperative that changes in the structure of inequalities in

Indian society can be brought only by conscious human intervention through administrative and political means.

9.3 Different scholars have emphasized different aspects of social inequality. Karl Marx emphasised the positions occupied by individuals in the organisation of production, ie. property rather than income or occupation as the basis for social inequality. Max Weber stressed a composite index of class, status and power as the basis for social stratification. He thought that the above factors may be differently combined in different situations and it may be that one or another factor of inequality may come to acquire special prominence in a particular society at a given phase of its historical development. At the present stage of development, Indian society may be viewed as a hierarchical system built around class, power and caste, with its own social awareness of purity and pollution. Caste distinctions are upheld by customary law and are also associated with the ownership and control of land. In such a society, birth, family and the extent of land owned determined life styles - dress, diet, habitation, speech and manners. In this system of hierarchical values and norms, inequalities not only existed in fact but also was considered legitimate with the result that its living spirit is characterised neither by much conflict nor by much change. This will explain our present difficulties involved in building a society on the promise of equality.

9.4 Caste inequality still has an important place in rural India. Since agriculture is the

mode of livelihood and a way of life for the majority of people in rural India, changes that take place in it are of profound significance for the people who live there. One also encounters the co-existence of very different patterns of inequality, some of which appear more traditional while others appear more modern. In all parts of the country, the agrarian society has been graded in layers or strata which were hierarchically arranged. In some areas, there might be many layers and in others only a few. But the pattern was everywhere hierarchial. In most parts of India land-owning groups avoided manual work for reasons of status or caste-dictated norms of ritual purity and pollution. This explains also the proliferation of intermediaries as a consequence of the tendency to avoid manual work However it should be recognized that the Indian society underwent major changes as a result of political change. Yet in a broad sense the association between caste on the one hand and ownership, control, and use of the land on the other becomes quite clear. Traditionally the larger owners are the highest castes, and members of the lowest castes are generally landless labourers. In between were the "cultivating" castes. Thus the present Indian society inherited unequal rights in the control and use of land which largely led to inequalities of the caste hierarchy. Agrarian relations in a sociological sense were, therefore, expressed in the idiom of castes. Recently land has been coming into the market and consequently some castes whose members did not own any land in the past were able to buy it. This slow and peaceful change had not led to any radical alteration of the social ladder since it was only a change from a system of cumulative inequalities to one

of dispersed inequalities. Since land has come to the market, it does not also follow that it will come to be more widely distributed among the lowest castes. Indeed, there is very little evidence of land being brought by people of the lowest castes. Land Reforms initiated by Congress Party in power were supposed to radically change the pattern of land ownership in favour of landless classes. But unfortunately implementation of these laws wherever they have been framed has been dilatory and half-hearted which has frustrated the basic purpose. There has been widespread evasion of the ceiling laws so that not much surplus land could be recovered and whatever land was re-distributed, had gone to the advantage of the higher strata and to the detriment of the lower. In many cases it also produced adverse consequences for tenants and share-croppers who often got evicted by their landlords. If the social pyramid has changed at all on account of the land reform implemented in various States in the country, this had been more by the top being slightly lowered than the bottom being raised.

9.5 There is widespread feeling now amongst the administrative and scientific leadership circles that the Government measures to reduce inequalities in the agrarian structure have mostly failed. In the circumstances, the only way in which the landless who were mainly Harijans could be made to exercise their rights is by creating a kind of political and social environment in which these rights would invariably respected by the erstwhile ownership classes and the bureaucracy. The political parties who are in power now or who hope to come to power in the near future have a responsibility

to see the existing system of inequalities is destroyed without at the same time creating a new one in the process.

9.6 The social role of the political and administrative leadership in this country has to be seen and performed in the context of a sociological critique of the equality provisions in the Constitution of India. A striking feature of the constitution which we have given unto ourselves is its extra-ordinary stress on equality. It is forcefully enshrined in the Preamble, the Fundamental Rights as well as in the Directive Principles of State Policy, Legislative Enactments and judicial pronouncements in the last three decades and they have re-inforced our strong pre-occupation with equality which developed as a part of the historical process during the movement for freedom from foreign bondage. The constitutional provisions indicate the directions in which we are to move. But the social forces embedded in the social structure seem to decide how far we are able to move and at what pace. Our practice continues to be permeated by inequality in every sphere of life. Our rural and urban communities are divided sub-divided, fragmented and fratured in innumerable gradations. There are numerous barriers between castes. Even today this rigid social stratification makes itself felt in the daily lives of the oppressed castes in general. This has prompted many to question whether there is in the Hindu system any appreciation at all of equality as a value.

9.7 It is this sense of history and awareness of the social forces that made Pandit Jawaharlal Nehru to declare "the spirit of the age is in favour

of equality" and that "the spirit of the age will triumph. That does not mean and cannot mean that everybody is physically or intellectually or spiritually equal or can be made so. But it does mean equal opportunities for all and no political, economic or social barrier in the way of any individual or group". He was also emphatic that "not only must equal opportunities be given to all, but special opportunities for educational, economic and cultural growth must be given to backward groups so as to enable them to catch up to those who are ahead of them".* Nehru did not subscribe to the view that for every difference between persons, there ought to be a difference of treatment. He rejected this argument as contrary to both reason and morality. He was emphatic that differences between persons are not allowed to interfere with our treatment of them as equal human beings. This view of Indian social situation continued to be the official position eventhough we are aware that no society other than ours has allowed such a luxuriant growth of invidious social distinctions. In planning for development for Scheduled Castes and Tribes, therefore, we have to keep a human point of view in the fore-front. Few groups in history could have suffered from the denial of the human point of view as much or as long as Scheduled Castes did. For 2000 years or more the untouchables and tribals have been treated as if they were less than human beings.

9.8 For centuries it was believed that men and women were of radically different capacities

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*Jawaharlal Nehru - "The Discovery of India", 1961, P.521.

and this sociological view of living and acting did develop in them different social capacities. In such a context if we make unequal provision for their socialisation on the basis of this erroneous belief, they will naturally develop unequal capacities. Even in Europe the idea of careers open to talent was a new one introduced in the wake of the French Revolution. In the old regime, the careers were not open to talent but were determined by birth. It is necessary that we understand the current Indian practice of reservation for backward classes, Harijans and Tribals in the matter of appointment to services and education opportunities in the light of the inherited social handicaps of the socially and economically disabled population. The need to throw careers open cannot be too strongly emphasised in our society where status has been more firmly fixed by birth than in any other society at a comparable level of development. The obstacles to free and open competition are many. There are, not only objective factors such as lack of means but also subjective factors like lack of motivation, whichis a consequence of centuries of organised discrimination. At the same time we have to consciously plan for a principle based on merit in a scientific and planned manner. As communities and caste groups graduate themselves in terms of social and economic development, the extent of reservation should proportionately be reduced with a view to end it altogether in a foreseeable future.

9.9 Meritocracy and competitive principles do not in themselves constitute a magic wand. There is something paradoxical about the principle of equality of opportunity which demands at best free and open competition. This means that there can

be equality only before the competition, but not afterwards. In other words, equality of opportunity can and does lead to inequality of result. This must be a source of serious concern in our society where the economically and socially backward constite the majority which is getting more and more organised and vocal. Therefore, when we recommend equality of opportunity as a way of eliminating discrimination, it should not be allowed to become an excuse for relentless competition without any regard for those who lose out in the race. The difficulty of achieving equality of opportunity becomes abundantly clear in our kind of society where the privileged are also overwhelmingly successful in every kind of competition. The difficulty lies in fully equalising the external conditions of competition. The examination system as well as the job market favours those who start with better resources and better motivation, both of which are products of their superior cultural and social position in the power system. The idea behind the need to provide a compensatory principle in the form of reservation in job and educational opportunities is that society must intervene in order to ensure that the competition is fair and not just free. Free and unhindered competition takes little account of the unequal needs of individuals who are unequally placed and who may need some cushion in the excesses of untempered competition.

9.10 This compensatory principle has received full recognition in Indian system of reservation for the backward, Scheduled Castes and Tribes. It owes its inspiration to socialist thought in that it relies more on the State than on the market

for achieving its objective. This protective discrimination is used by the State in favour of groups that had in the past been discriminated against. Article 16 of the Constitution itself qualifies the equal opportunity provision by special provisions for backward classes of citizens, and similar provisions have been introduced by Article 15 by amendment of the Constitution. The first seeks to give free play to merit; the second seeks to accommodate specified needs. What is stressed here is, therefore, the difference between individual merit and the needs of groups or classes of citizens. The argument behind protective discrimination is that certain castes have special claims on society. That cannot be sacrificed altogether to the pursuit of individual excellence.

9.11 All the same in a fast moving world where there is an explosion of science and technology and where management problems of unprecedented growth and expansion have assumed global proportions, Indian society cannot hope to prosper unless it gives an important place to the claims of individual merit. Therefore individual merit cannot be overlooked in setting rival claims among individual members of this developing society. While our society in the present stage of existence cannot leave everything to individual merit in untempered competition, we must learn to set limits to this intervention which in the long run may lead to an undue emphasis on mediocrity and parasitism. Conflicts and social tensions are sought to be created on the issue of reservation often by vested interests on both sides in the fertile climate of abdication of political authority and administrative alertness. No society starts on a clean slate and age-old disparities must be taken into account, if the equality in the new social order is to be real

and not merely formal. But then, we should be careful and vigilant about creating new inequalities in the process of destroying old ones.

ii
Scheduled Castes

9.12 According to 1981 Census the Scheduled Castes population in India is 104.8 millions which is 15.75 per cent of the total population. The major concentration of the Scheduled Castes is in Uttar Pradesh (22.39%), West Bengal (11.46%), Bihar (9.68%), Tamil Nadu (8.48%), Andhra Pradesh (7.6%), Madhya Pradesh (7.02%), Rajasthan (5.57%) and Karnataka (5.34%). Together these eight States account for 77.5 per cent of the Scheduled Caste population in the country.

9.13 Eightyfour per cent of the Scheduled Caste population live in rural areas and only 16 per cent in urban areas. The bulk reside in slums without amenities such as drinking water, link roads, sanitation or a minimum standard of housing. They are mainly landless agricultural labourers or share croppers. The cultivators among them form 28.17 per cent. They are largely marginal farmers falling in the poverty group along with landless agricultural labourers. They are also engaged in traditional occupations such as leather work, bamboo and cane, fishing, etc. Their occupational profile is linked with very low economic and social status. They have hardly any assets and they suffer from the dual handicap of economic deprivation and social disability arising out of the stigma of untouchability and denial of opportunities.

9.14 Literacy rate among Scheduled Castes according to 1981 Census is only 21.38 per cent

as against 41.3 per cent for the rest of the population. The percentage of literacy among their women is only 10.9 per cent as against 29.5 for women in the rest of the society. In every State the literacy level of Scheduled Castes lags behind the literacy level of non-scheduled castes which shows that the educational backwardness is on account of their peculiar socio-economic conditions

9.15 The development strategy adopted in the earlier Five Year Plans was that the benefits of economic development both in agriculture and industry would trickle down to the poorest of the poor. Experience was that it failed to materialise. Therefore, the Planning Commission has adopted a new strategy from the beginning of the Sixth Plan based on (a) Special Component Plans, (b) Special Central Assistance and (c) Scheduled Castes Development Corporations. The Special Component Plan is designed to channelise the flow of benefits and outlays from the General Sectors in the Plan of the States and the Central Ministries. These are designed to help poor Scheduled Caste families through composite income generating programmes. The Special Component Plans also seek to improve their living conditions through provision of protected drinking water, link roads, house sites, primary schools, health centres, nutrition centres, rural electrification, common facility centres etc. The outlays on the Special Component Plan under these heads rose from Rs.528 crores in 1980-81 to Rs.755 crores in 1983-84.

9.16 The Special Central Assistance is given to the States to the use of the same for income generating economic development schemes. The total allocation under this head during the Sixth Plan was Rs.600 crores. The Scheduled Castes Development

Corporations are envisaged to develop entrepreneurship amongst them and sponsor eligible candidates to financial institutions. Presently there are about 19 such Corporations mobilising institutional credit for Scheduled Caste entrepreneurs functioning as catalysts, promotors and guarantors. The outlay during the Sixth Plan under the head was around Rs.80 crores.

9.17 An overview of the Scheduled Caste's development programmes would show that there are a very large number of small schemes like distribution of mini kits, seeds, land levelling, land bunding, minor irrigation, etc. all of which are land based. Unfortunately, the basic data on the land holding pattern is just not available and, therefore, it has become difficult to formulate meaningful programmes that would make an impact on Scheduled Caste families. Most of their lands are scattered in a number of very tiny plots and these cultivators are still outside the pale of many programmes taken up in the agricultural sector. Very little of the earmarked funds has been absorbed for want of careful integrated planning and implementation by sectoral agencies. Even in the case of allottees of surplus land which is often of sub-marginal quality, the utilisation is not linked up with meaningful programmes. This largely explains the failure of the Special Component Plan in many States. The physical and financial targets under various sectors cannot be disaggregated and implemented, except in terms of clear knowledge of the distribution and ownership of land resources amongst Scheduled Caste family units.

9.18 It may be seen that the percentage of outlays under Special Component Plan is much smaller than the percentage of Scheduled Caste population in most of the States (Table 9.1).

Table 9.1

Outlay on Special Component Plan Vis-a-vis the Total Plan Outlay for the Annual Plans 1982-83 and 1983-84

(Rs.in crores)

Sl. No.	State/ Union Territory	1982-83			1983-84		
		Total Plan Outlay	SCP Outlay	Percen-tage	Total Plan Outlay	SCP Outlay	Percen-tage
1	2	3	4	5	6	7	8
1.	Andhra Pradesh	605.00	63.67	10.52	826.23	139.51	16.89
2.	Assam	238.00	4.31	1.81	291.00	5.68	1.95
3.	Bihar	670.00	58.77	8.77	681.00	43.58	6.40
4.	Gujarat	760.00	17.58	2.31	900.00	19.08	2.12
5.	Haryana	320.00	24.68	7.71	406.59	28.24	6.92
6.	Himachal Pradesh	120.00	10.16	8.46	138.58	15.40	11.11
7.	Jammu & Kashmir	168.00	0.86	0.51	185.00	6.14	3.32
8.	Karnataka	475.00	63.39	13.35	575.00	53.14	9.24
9.	Kerala	275.00	15.59	5.66	320.00	20.75	6.48
10.	Madhya Pradesh	725.00	46.71	6.44	855.00	46.98	5.49
11.	Mahara-shtra	1322.00	31.01	2.34	1500.00	30.81	2.05
12.	Manipur	48.00	0.90	1.87	52.80	0.78	1.48
13.	Orissa	300.00	11.57	3.86	345.00	27.25	7.90
14.	Punjab	385.00	20.50	5.32	440.00	23.47	5.33
15.	Rajasthan	340.00	30.73	9.03	401.00	40.31	10.05
16.	Sikkim	25.41	0.41	1.61	30.50	0.44	1.43
17.	Tamil Nadu	711.00	103.41	14.54	845.00	76.00	8.99

Contd.....

1	2	3	4	5	6	7	8
18.	Tripura	50.00	4.61	9.22	58.00	5.78	9.97
19.	Uttar Pradesh	1132.00	121.00	10.69	1375.00	117.60	8.55
20.	West Bengal	490.00	29,17	5.95	540.00	36.44	6.75
21.	Chandigarh	23.77	0.99	4.16	28.00	1.52	5.42
22.	Delhi	200.00	11.92	5.96	250.00	12.87	5.15
23.	Goa, Daman & Diu	44.12	0.30	0.67	56.60	0.26	0.47
24.	Pondicherry	18.19	2.60	14.29	20.50	2.93	14.31
	Total	9445.49	675.76	7.15	11120.80	754.86	6.79

Many States take the view that the share of the outlays of the individual sectors go to the benefits of the Scheduled Castes and that is adduced as a justification for smaller percentage outlays under the Component Plan. This is a lame argument since the general sector investments do not automatically go to the Scheduled Caste population who are basically a non-ownership class. It is, therefore, necessary to deliberately channelise the benefits from these sectors towards the Scheduled Castes. Experiences show that it is also possible to formulate new divisible schemes even in so called indivisible sectors or even in major infrastructure sectors. The foundation for the flow of resources to Special Component Plan has been well laid now and it is the task of the political and administrative leadership to carry forward this strategy

to the beneficiary families and individuals closing the many loopholes and handicaps that prevail all the way. The process can be perfected only if planning and implementation are decentralised at the district and block levels. People's representatives and voluntary organisations could thus be involved effectively not only in identification of schemes but also in formulation and implementation. In a decentralised administrative set-up the beneficiaries will have sufficient opportunities to gain experience of management of different programmes taken up for them. This will ensure better utilisation and effective supervision.

9.19 During the Sixth Plan period a provision of Rs.353 crores is made for allotment of house sites to 6.8 million families. Already 52 lakh families have been given house sites. Of the 33 million slum dwellers, 7 million have been given some construction assistance or other type of help to improve their living environment. During the Seventh Plan the target is to cover atleast 50 per cent of the Scheduled Caste families to enable them to cross the poverty line.

9.20 The Central question in any Scheduled Caste and Scheduled Tribe development strategy is land and its equitable distribution. The distinguishing feature of these target groups is largely their boundness to land and production technology, oriented to primitive agriculture. Their inherited know-how and management abilities are confined largely to agriculture. This is their greatest asset. For centuries they have been divorced from the ownership and management of the land on which they are employed to cultivate, resulting in an

acute degree of alienation from their known living environment and work. Recently alienation and dispossession of land on a large scale have taken place everywhere. Such deprivation has struck at the very roots of economic and social cohesion. The problem facing Scheduled Castes is lack of assets in the form of land. This transfer of assets can only be achieved through effective implementation ofland reforms and enforcement of land ceiling laws both in rural and urban areas. The present state of things in the field of land relations in India are illusory in the sense that it has forced the Scheduled Caste beneficiaries into land dispute without access to local political support. Effective steps may, therefore, be taken to ensure that whatever land is owned or allotted to them is actually in their possession and that they are able to enjoy fully the income from them. In all land disputes involving Scheduled Castes and Scheduled Tribes, the State should invariably implead as an interested party so that the cost of litigation do not destroy the already slender economic base of these families. This is important because the land disputes have a tendency to become criminal cases in which the Scheduled Castes are dragged and harassed. Sometimes atrocities are perpetrated on them. "The law and order" authorities often are found to act in collusion with the landlords and their political henchmen who use their social position to defeat provisions of legislation with respect to land reforms, minimum wages and bonded labour. Ceiling laws should be enforced with all earnestness and the surplus lands should be distributed among the Scheduled Castes as a time-bound programme. The built-in loopholes in the present ceiling laws should be effectively plugged to ensure that none is allowed to retain land above the ceiling fixed by law. Endowment-land of temples and

other religious institutions should be leased out on long-term basis to Scheduled Castes. Penal provision should also be made in land laws to severely and deterrently deal with encroachers and unauthorised occupants. Consolidation of scattered land of Scheduled Castes may also be attempted on priority basis. Government should register, as a priority task, the names of all share croppers and insecure tenants and prepare scientific land records within a very short period. Minimum wages for agricultural workers should be strictly enforced. The NREP should also be enlarged to cover all the Scheduled Caste households to create durable comunity assets and utilise the country's available foodstock for insulating the economically handicapped from hunger.

iii
Scheduled Tribes

9.21 A tribe is a self-contained unit and its boundaries demarcate certain limits of interaction in the legal, economic and social activity - spheres. It has a clear linguistic and cultural boundary which provides the frame for the mores, the folkways and informal interactions of its members. In India today the tribes which answer to the ideal type concept are rarely to be found. What we have are tribes in transition. Many of them have been tribes in the past and in several ways they only approximate to the requirements of definition.

9.22 According to 1981 Census the tribal population in the country is 51.63 million persons. That is about 7.76 per cent of the total population

of the country. In 1971 the corresponding figures were 41.0 million and 7.48 per cent respectively. Thus the tribal population has grown by 25.4 per cent during the decade. About 55 per cent of the scheduled tribes are centred in the East and Central Tribal belt comprising of West Bengal, Bihar, Madhya Pradesh, Orissa and part of Andhra Pradesh, about 28 per cent are in the Western Tribal belt spread over Gujarat, Maharashtra, Rajasthan, Dadra, Nagar Haveli and Goa, Daman and Diu. Only 6 per cent of the tribal population live in South India - parts of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. About 10 per cent are in North East India. These figures showed certain patterns of concentration - Meghalaya (80.5 per cent), Nagaland (84 per cent), Arunachal Pradesh (70 per cent), Lakshadweep (94 per cent), and Mizoram (94 per cent). There are five States which have more than 20 per cent of the population belonging to Tribes - Madhya Pradesh (23 per cent), Manipur (27 per cent), Orissa (23 per cent), Sikkim (23 per cent) and Tripura (28 per cent). The available information suggest that there are about 650 Blocks where the tribals form the majority of the population and they account for about 75 per cent of the tribal population in the country. For a correct appraisal of the tribal situation in India, it is necessary to take full cognizance of the geographical pattern of distribution of the tribal communities and view the same in the political and historical context of developments in India and abroad.

9.23 It was the colonial period which brought most of them under a common political organisation. Independence has brought new social forces to influence their way of life while a feudal mode of production prevailed unhindered during the colonial

regime. During the post-independence period while the vestiges of feudal mode of production continued, an alliance between feudal and capitalist forces is becoming the predominant pattern within a traditional social organisation dominated by the caste system. Productive activities are being more and more oriented to the needs of the national market. Yet the self-image of these communities is one of being exterior to the Hindu-fold, whereas the Hindu majority in the rest of the country consider them as primitive. In view of their growing technology and education and development of a small entrepreneurial class, a minority psychology syndrome is slowly growing which is also being operated and exploited by outside religious and political forces.

9.24 The percentage of urban population is 6.20 only, though a large number of towns and industrial establishments have come up recently in the tribal areas. It may be noted, however, that the urban and economic life in these new townships are fully dominated by non-tribals. The percentage of literacy among the scheduled tribes in 1981 was 16.4. Inter-State variations in the percentage of literacy is quite considerable ranging from 7.6 per cent in Andhra Pradesh to 60 per cent in Mizoram. During this period, in many areas there has taken place a rapid spread of higher education leading to a significant degree of social and economic stratification within the tribal communities. In 1981, 55 per cent of the Scheduled Tribe workers were enumerated as cultivators, 33 per cent as agricultural labourers, and the rest as others. Shifting cultivation is estimated to cover 26.7 million acres of land and is practised by 3.55 lakh families. Settled agriculture is the predomi-

nant source of livelihood among the overwhelming majority of the tribals. It is a fact that the land cultivated by them are comparatively infertile and less productive, and therefore, they depend on collection of jungle produce as supplementary source of livelihood. Though a number of them have got employment in organised industries or occupations requiring high skill, the bulk of them still remains outside the modern industrial and commercial complex.

9.25 Planning in India has set itself the following tasks in respect of the tribal populations:-

(i) To build a two-way communication between the tribal communities and their neighbours in the overall framework of national integration.

(ii) To protect the resource base and cultural apparatus of the tribal population so that it can serve as a wide basis for collective efforts for meeting the modern challenges; and

(iii) To initiate measure for meeting the minimum needs of the tribal population and for facilitating the process of participatory development. The State, has, therefore, reserved proportionate representation in legislatures, educational opportunities as well as reservation of appointments of posts in the services under the State. The executive power in the Union shall extend to giving directions to States in these matters. Art. 275 (1) of the Constitution provides for grant-in-aid from the Union to the States for promoting welfare of Scheduled Tribes.

9.26 The planning process in the Centre and the States has devoted special attention in the early stages to the development of these areas through community development programmes and special multi-purpose tribl development projects. Soon it was recognised that there were certain cultural constraints to tribal development. Rather than defining the parameters of development in terms of historical and structural features of respective tribal communities, the planners attempted to get their plans and programmes accepted by the tribes without making necessary attempts to dovetail them with tribal perceptions. And to that extent the approach failed. To handle this problem tribal sub plans are drawn up for respective areas taking into account these peculiarities. By 1970, 181 Intensive Tribal Development Programmes (ITDP), 245 Modified Area Development Approach (MADA), and 72 Primitive Tribe Projects (PTP) were in operation in the country and the coverage of the tribal population was 75 per cent. The emphasis now is on poverty alleviation with a view to raising a substantial number of tribal families above the poverty line. This can happen only if effective legal and administrative steps are taken to eliminate the high degree of exploitation by outsiders which is currently the ost powerful obstacle to any self-help programmes for the tribals.

9.27 The key to the development of tribals through their own enthusiastic participation lies in the protection and transformation of their traditional rights in land resources. During these decades there is plenty of evidence to show that their land rights have been abrogated largely to their own disadvantage without at the same time increasing

employment opportunities. Even the survey and settlement operations in many areas have been used against them by vested interests while at the same time the absence of statutory records of rights have prevented commercial banks and other financial institutions from providing long term loans to them. The available information at the policy making level about the property relations, indigenous systems of environmental management of soil and water, productive activities and labour utilisation is much too poor to act as effective instrument of social change. Settlers have encroached on tribal lands and often the tribals are forced to transfer ownership rights at extremely low prices. The result is that agriculture has now become an area of uncertainty and anxiety for them. Further their claims over other forest produce have been eroded almost totally. Growing disparities accentuate existing cleavages and are creating new ones. Modern development thrusts initiated by the settlers from outside are drawing into their folds more and more tribal population through consumerism, austentation and wastes. The attempt should rather be to improve the quality of their life in terms of needed services and to ensure that the gains are justly and equitably distributed among the indigenous people. Recent studies show that the process of alienation of land is more intense in the areas where development has taken place in the absence of effective political leadership among them to safeguard their interest.

9.28 The Indian people are undergoing a profound social change which constitutes a mighty challenge to the human goodwill, understanding and accommodation. The new generation should therefore be enabled to develop attitudes and values

quite distinct from their elders in respect of the social life, religious institutions and especially caste hierarchy. We should exclude violence and large scale social disorganisations in our planning for social revolution. This social revolution implies quick and fundamental changes in the values, institutions and traditional ways of living. The problem calls for a realistic solution which would ensure growth with social justice. The harijan problem was innermost in his heart when Mahatma Gandhi said, "I shall work for an India in which the poorest shall feel that it is their country in whose making they have an effective voice: an India in which there shall be no high class or low class of people; an India in which all communities will live in perfect harmony".

CHAPTER X

SCIENCE AND TECHNOLOGY

Development of modern science and technology has enhanced the ability of advanced nations both capitalist and socialist to utilise the forces of nature and thus achieve a much higher material standard of life for their people. A major part of the world including India, however, still remains under-developed by these standards. In more senses than one, what the developed countries have and the under-developed and developing countries lack is an economy based on modern technology and a society with a scientific outlook. The problem of developing these countries, is, therefore, one of establishing a culture of science in them in the place of a semi-feudal system of production and distribution and out-moded sociological values and habits of thought engendered by them. Our own experience in the last few decades is that it is not possible to modernise our economy without the aid of advanced science and technology.

10.2 Science was given pride of place in the national life only since independence eventhough there existed sizeable scientific activity in Indian Universities and certain scientific departments of Government. This welcome development was largely due to the vision and powerful support of Pandit Jawaharlal Nehru. He saw the essential role of science in its historical perspective, not only in transforming the material environment but in transforming man. For Panditji, "it is an inherent obligation of a great country like India, with its traditions of scholarship and original thinking and its cultural heritage to participate fully

in the march of science which is probably mankind's greatest enterprise today".

10.3 We must build up a scientific outlook as an integral part of our mental make up. To be able to do this, scientific activity should be well developed in every aspect of living. Above all, science teaching and research in schools, colleges, universities and other higher institutions of learning must be strengthened and expanded. Recently, the Government of India have initiated several progressive measures in furtherance of Science and Technology. The National Committee on Science and Technology has prepared a perspective plan for the development of Science and Technology and a policy statement on Science and Technology has been released which has been well received by the scientific community in the country.

10.4 It is well recognised that sustained pursuit of scientific enquiry and the systematic application of the fruits thereof to the task of bettering the human condition have been factors which through the centuries have led to a radical transformation of men's material and cultural environment. Consequently, the conscious promotion of science and technology for enriching the cultural and material foundations of society has to be one of the principal objectives of any progressive Government. The people and the Government of India have since long been committed to this objective and they have some achievements to their credit, particularly in providing educational support. However, in the present context, efforts and investments in this direction have to be far greater and more diversified than before.

10.5 Scientific research and application of technology are social activities which affect the structure and dynamism of every society and which in turn, are affected by socio-cultural mores of society and its economic capabilities. As social activities, they are amenable to and require a measure of planning and direction so as to:

(a) subserve the goals and strategy pertaining to the development and security of the nation; and

(b) in turn, help to shape those goals and strategies in the interests of peace and justice within and between nations.

India has adopted such an approach to the promotion of Science and Technology.

10.6 Through a National Plan for Science and Technology, the Central Government has attempted to frame policies and guidelines so as to ensure (a) that we build our scientific and technological capabilities in areas related to our needs and in the interests of national welfare and (b) that we avoid the risk of fragmented efforts of different agencies and wasteful duplication of efforts. The national objectives of providing on a priority basis, the basic minimum needs of the common man such as food, clothing, housing, health, education, water supply, communications and adequate employment opportunities, the development of self-reliance, the reduction of import of technology, maximisation of returns from the existing investments in science and technology, full development of the natural endowments of each region over a period of time,

and safeguarding the quality of environment, are among the important parameters within which the policy for science and technology has to be formulated and implemented.

10.7 It is admitted that planning science and technology for economic and social development in this manner is a relatively new concept, and as such the initial efforts may have inadequacies. It has to be recognised that scientists and technologists should be fully involved in this planning process along with others, that appropriate institutional arrangements have to be made for the purpose, and that we continuously review our plans, policies and targets in this area of science and technology in order to ensure that our planning process improves with experience and that our plans are adopted to changing situations.

10.8 Government control of science so far has been largely viewed only from the administrative context and that too without reference to its role in development. In the historical process of evolution of scientific departments in the country these had functioned as field of executive agencies which have played only a subordinate or even a minor role in shaping Government policies. It is recognised that this system should be replaced by a new outlook in the handling of science and technology at Government level, by the association of scientists and technologists with the Governmental machinery and policy making, and by the development of research and educational institutions which will maintain a high standard of activity and intellectual integrity and will pay the highest consideration to pursuit of knowledge and its application to human welfare as the worthwhile endeavour in itself.

10.9 As science and technology are relevant to almost all sectors of the developmental effort they have to be promoted with reference to each sector in the light of the level of science and technology currently available to that sector. These sectors include, economic activities such as agriculture, industry, mining, transportation and communication, and welfare activities like health, nutrition, population control and education. In regard to each such sector, there is a network of activities covered by the term 'Science and Technology' which, though complex, may be classified into four areas for purposes of analysis and policy formulation. These are:

i) Creation and Diffusion of Scientific and Technical Skills;
ii) Provision of Scientific and Technological Services;
iii) Research and Development; and
iv) Application of Science and Technology.

10.10 With reference to each economic or welfare sector referred to above, an appropriate package of policies, strategies and investments are required to be formulated and these in turn, will have to be related to each of the four areas of scientific and technological activity referred to above. To illustrate this, for agriculture we have to create relevant policies, and appropriate institutions concerned with research and development, provision of scientific and technological services, and creation and diffusion of scientific and technological skills, and we have to create conditions for the extensive application of agricultural science and technology. A major part of the policy framework will differ from sector to sector.

Also separate, though similar, institutions or wings would have to be created for each sector. However, for the co-ordinated development of Science and Technology as a whole appropriate policies and investments have also to be formulated and implemented.

10.11 With regard to national plans and policies in the area of Science and Technology, Government recognises that there are many programmes and policies in which the responsibility for implementation has devolved on the Government. In the formulation and review of national plans and policies the nation as a whole has to participate and consequently, each State Government has its own legitimate role to play in the common task of examining national problems and suggesting solutions. Further, within the general framework of national plans and policies and Science and Technology each State has responsibility of outlining supplementary programmes and policies with special reference to the natural endowments and unique socio-economic situation of the State. For the effective performance of these tasks, the Government should invite the scientific community in the State, particularly those in the Universities, other educational institutions and research establishments, to consider the problems and tasks in their respective areas of interest, and to participate with Government and the public in the discharge of these tasks. Every department should identify the science and technology component of its sectoral plans and ensure its effective implementation.

10.12 Promotion of Science and Technology requires in fact an institutional framework which can attract the best available talent in the country and is free from interference and restrictions

of the kind that would be inevitable within the usual Government set-up. This is best provided by research centres that have the freedom to develop their work along independent lines. Both in the conceptualization of the tasks to be undertaken, and in their execution, it is essential that the responsibility is entrusted to persons who have made important contributions in the areas concerned and who will ensure that the standards of achievement aimed at will compare favourably with those established internationally in the respective disciplines.

10.13 In view of the scarcity of personnel with the capacity for giving intellectual leadership of the kind necessary it is vital that an enlightened open-door policy be followed in regard to the selection of staff and students in these centres of research and training. The aim should be to secure the best talent available in the country not influenced by regional or other such considerations.

10.14 Great care will also need to be taken to ensure that the financial resources available for the purpose are put to effective use and not frittered away. For this it is essential that the area selected for deploying these resources have obvious relevance to the problems of the nation, and that the effort is not spread too widely and thinly, so that significant results can be achieved within a reasonable period of time.

10.15 Autonomous research institutions staffed by personnel of high quality will be able to attract funds from sources other than the Government. In

fact this is among the important advantages of setting up such institutions. It is therefore essential that these institutions should not only be free to receive funds from other sources but even encouraged to do so provided they do not deflect them from the objectives for which they have been set up.

10.16 Autonomy should not, of course, imply non-accountability. The question to consider is only how best such accountability is to be ensured without detriment to the kind of freedom and initiative which would be necessary for the effective functioning of these institutions. There are many important ways in which this can be done. Each institution should be required to prepare a perspective plan of its work, covering a period of about 5 years, and evaluate its work at periodic intervals. It could also be evaluated independently, at longer intervals, by persons of recognised eminence from outside. Adequate provisions for publication of research work and for the association of scholars from other institutions within the country and abroad are other means for ensuring that there is continuous evaluation by persons who have the necessary competence.

10.17 The general policy would be to provide block grants to the institution concerned on the basis of their 5 year perspective plans and treat such block grants as commitments for the period. The continuance of similar block grants beyond each such period might be made conditional on professional evaluation of the work completed and the further work proposed. It is important to ensure that such evaluation does not degenerate into audit

in the usual sense of the term. While audit of funds is essential, it should be based on an enlightened view of the special problems and requirements of research and not be reduced to procedures which have an inhibiting effect on the work of these institutions.

10.18 While autonomy is essential for the development of research institutions of quality, it is essential that they do not grow in seclusion and that they made effective contributions to higher education in the concerned disciplines within the region. In fact, it is only by inter-action between them and the other institutions of higher learning that the scope for the development of Science and Technology can widen over a period of time.

10.19 The preceding pragraphs deal with the approach to be adopted for ensuring autonomy of scientific institutions. However, a reform in the managerial set up of scientific establishments is required, not only in regard to the relationship between Government and those establishments, but also in their internal management. The National Committee on Science and Technology has observed in their document, "An Approach to the Science and Technology Plan" issued in January 1973:-

"The scientific establishments in our country have, with rare exceptions, imbibed the culture of the administrative services, its extensive rules and regulations, its weighty statutes and precedents and its zealously guarded and regulated hierarchies and jurisdictions. Indeed, the two problems characteristic of this administrative systems - hierarchy and detailed administrative regulatory mechanisms - are the very ones which are the most inimical to the development of effective scientific institu-

tions. There is thus today a desparate need for innovations in both the style and methodology of administrative functioning inside and outside the scientific establishment if the latter are to fulfil the high expectations raised of the capability of science and technology for making major contributions to our development".

10.20 The Government should endeavour to help scientific institutions coming within its jurisdiction to develop an internal functioning system which would enable the scientists and technologists to make their full contribution and fulfill their accountability without being stifled in the process.

10.21 Government have embarked upon a policy of increasing the association of scientists, technologists and social scientists in Government work generally, as they are of opinion that for the orderly and rapid growth of our economy the administrative machinery should function in close association with such intellectual talent. For this purpose, Government should encourage movement of suitable personnel between scientific institutions and administration at appropriate levels and with necessary authority and status.

10.22 The Government is committed to providing the requisite support for the creation and diffusion of scientific and technical knowledge and skills. It is recognised that our efforts have to cover science education at primary and secondary school levels, science education at the University undergraduate and post-graduate levels, technical education at the polytechnic and university levels, Industrial Training Institutes for training of

craftsmen, provision of facilities for training and apprenticeship in industry, and manpower planning for science and technology. Although Government have taken some steps in these directions, much more remains to be done. In particular, Government should support the development of research activities at the University and College level and shall provide funds for supporting this activity. Steps have to be taken for establishing closer liaison between engineering college and the industry and for the successful implementation of the Apprenticeship (Amendment) Act 1973. Steps are also to be taken to start technological and advanced scientific education in areas like ship building, geology, fisheries and forestry, which are of particular importance to the States.

10.23 In conclusion, the progress of science and technology in society requires not only the creation and motivation of a large body of intellectuals committed to this effort, but also the creation of a scientific temper among the masses. There are cultural and social impediments in our society to the development of science and technology and some of these are long-standing and deep-rooted. We have to create an awareness among the people of the importance of science and technology of socio-economic development and of the value system inherent in a scientific approach to all things. In this major task, the presentation of science and technology through the medium of regional language is a matter of great importance. The Government should give full support to all efforts in this behalf, whether of voluntary groups like Sastra Sahitya Parishads or from other educational or specialised agencies.

10.24 Organised science in our country is still in its infancy and the number of outstanding scientists is limited. In such a climate the standard method of planning centres of excellence and research laboratories is often forced on many of them by the administrative and financial practices of Government. As Professor P.M.S.Blackett has observed, "We must endow ability whenever it is found and we must guard against subsidising mediocrity". Our experience in the last three decades has proved that the standard method is certainly not conducive to achieving this aim. Government is spending large sums now on supporting scientific research and technical development and it is Government's interest to study and devise, *de novo*, the best administrative and financial procedures for scientific institutions and for getting the maximum return on the money spent. To apply existing administrative and financial procedures devised for an entirely different purpose of managing scientific institutions is largely to defeat the purpose which the Government has in view.

10.25 Scientists and even administrators who have no political interest are by definition interested in freedom. Their concern is for the freedom of their own research and decision making rights. Academicians cherish the privilege of unhampered investigation and teaching while the administrator should be currently informed of the inner spirit of the developing science and the dialectical process of growth implicit in a dying order. In that sense we should think of science as the intellectual force that challenges traditional authority and the conventional wisdom that goes around as gospel truth. We should not forget that the inner spirit of science is one of freedom and the process

of scientific enquiry requires freedom. Therefore, political influence on science and administration must be in the direction of the enlargement of the freedom of the many even when it involves limitation or curtailment of the freedom of the privileged few.

10.26 Scientists in a free democratic society have to be clearly committed to the cause of freedom, and therefore, the duty is cast on them to increase the spirit of independence and open criticism within the framework of the available free institutions. But a serious danger has to be guarded against. Whenever science tries to become a unified and authoritative system of thought guiding all types of actions, it is likely to degenerate into a rationalisation of a will to power rather than a vaild intellectual discipline. In a country like ours we have yet to establish the essentials of human freedom destroying in its pursuit the iron grip of caste hierarchy and the almost tribal value systems engendered by it, before science can become a powerful creative force in society. Science in India can have a chance to flourish and develop only after a deep-rooted cultural revolution in both intellectual and social affairs is ushered in by the politician who is uncompromisingly committed to social change. We should not be tempted to entrust our administrators with unlimited authority based on the doctrine of the popular faith in science. It should be made clear that science alone, without intellectual checks and balances, provided by other social disciplines will not fortify a political order against temptations to use power to force man to be free. Though science has given mankind greater certainty of knowledge, it

has gained that certainty by renouncing concern for purpose that must remain at the heart of politics and administration in both practice and theory. The maintenance of privileges of private property or defence of the prerogatives of several segments of society in the present day sociological context will be one of the most fundamental threats of freedom. It will be ridiculous to think that the natural sciences can extend their domain over other forms of learning. Those who are trained in natural sciences or social sciences or even other cultural pursuits will have the social responsibility to familiarise themselves with what happens in the other branches of science than their own so that one increases one's usefulness and respect for team-work. The politician's ability to control technology and science in a responsible manner depends on the assumption that modern science and a healthy attitude to science can influence our political ends as well as our administrative and scientific means.

10.27 Science has a profound influence on the way we all think about ends and means, and the values as well as the social system will have to accommodate themselves to that fact. In politics ends and values are those purposes and policy judgements on the basis of which politicians in a free democratic system have to be responsible to the electorate and obviously, science, more so because a scientific attitude has a profound effect on the ways in which a political and administrative system makes its most important choices.

10.28 Modern administration therefore has to be a function of an interaction between an informed politician and a trained administrator. To

the extent the former lacks the necessary information and the latter is out of date and irrelevant and lacks the necessary training, the minimum basis for an efficient administration cannot be assured. Science has to supply much of the great body of factual knowledge that we must agree on, if our agreements about choices that are open to us are to be conducted on some rational and orderly basis. Such an arrangement, will, of course, sweep away superstitions that paralyse administrative and political responsibility. It will open up new opportunities and new possibilities for co-operation and thus make the concept of a public interest more meaningful though at the same time more complicated and difficult to define. It is impossible, therefore, to expect either science or scientifically trained administrators not to be deeply involved in the major issues that confront a modern Government.

10.29 In a planned economy, the innovation process has to set in motion by agencies generating and utilising technological knowledge in terms of planned allocation and coordination of research and development. Analytical issues of our technology policy may have to be tackled at the levels of planning, organisation and management of Science and R & D institutions. One problem is to decide on the tempo of restructuring the economy and its modernisation by establishing correct relations of production. This process is aimed at correcting imbalances created by the lowest development time of the colonial past and the errors of the post-independence period. Technological innovation in the prevailing mileau will be influenced by market forces, profits and private ownership of factors of production.

10.30 In India, different phases in the science and Technology policy development could be identified. The first phase is marked by technological progress based on large scale capital construction with technical assistance from western capitalist countries like the U.S.A., Britain, Germany and France on the one hand, and the socialist countries like U.S.S.R. and East Germany on the other. The second phase is noted for its emphasis on an autonomous, self-reliant development of technology and modernisation of the organisation and management of science in general. We are entering the third phase now where modernisation of technology within the existing multi-layer structure seeks to emphasise professionalism and sophistication with an open door policy of technology import. The basic components of this strategy are:

(i) Optimum combination among alternative technologies, and

(ii) the choice between technology import and indigenous development.

10.31 Therefore, there is co-existence of large scale capital intensive and small-scale labour intensive production techniques. We are switching over to high technology process in respect of a large number of products, which has resulted in the growth of a multi-layer technological structure. Technological innovations in the capital-intensive large-scale sector should sooner than later lead to productivity increases in the labour-intensive large-scale sector. The proportion of capital construction in the fixed investments by the State and private sector enterprises will tend to increase in the future years along with a large increase

in technological innovation and organisational change. Simultaneously there will be renovation and upgradation of key technologies in existing plants with a possible tilt in imphasis in favour of light industry and consumption goods. Such a multi-layer approach would have a favourable impact on raising employment and consumption.

10.32 Self-reliance in Science and Technology can never mean self-imposed autarchy. As an integral part of the multi-layer structure which has developed from history, we give priority to the use of domestic resources while we welcome with sufficient discrimination, foreign investment, import and assimilation of technological inputs in the modernisation process. This would, therefore, make it imperative for us to follow an open-door policy in the import of advanced technology in industry, agriculture, national defence, medicine and basic sciences. A strategic measure is to open up, more and more, the economy to the world outside and to create an attractive environment for external economic relations. It is necessary, therefore, to dispel fears amd attract foreign participation by initiating a number of legislative measures, organisational reforms, incentives and tax concessions. India, under the new leadership is keen to perfect our economic legislation, provide liberal treatment (with regard to taxes, prices and wages) to improve the climate for foreign investments involving high technology transfer. Speedy action is being taken for codification and publication of commercial laws and practices concerning foreign investment, technology import and trade. Along with these legislative simplification and rationalisation efforts are also contemplated to simplify

administrative procedures, decentralise planning and implementation and to institutionalise external economic relations. Indian policy limits technology import to preferred areas in accordance with the need of strengthening the domestic technological base. India is cautious and guarded in its approach to foreign majority participation. India has yet to develop an institutional structure for technology diffusion. A number of State, Central or Private sector institutions are engaged in dissemination of technical information to end-users. Technology diffusion in this country is a slow process. The links between R & D organisations and the needs of the production sector should be shaped as to integrate indigenous innovation processes with the production sector (Table 10.1).

Table 10.1

Incentives for Foreign Investment in India

I. Corporate Tax Incentives
(a) Exemption from Income Tax upto 25% in respect of enterprises outside Free Trade Zones (FTZ).
(b) Complete tax exemption for industries in FITs for five years.
(c) Investment allowances for specified industries
(d) Special tax incentives for setting up industries in backward areas.
(e) Depreciation allowances on capital assets.
(f) Investment allowance to specified industries.

Contd.....

II. Tariff Incentives

Duty free imports of raw materials capital goods or components for 100 per cent export oriented units

III. Other Incentives

Deduction of expenditure on scientific research.

Weighted deduction in expenditure on R & D.

We have not yet achieved a satisfactory level of integration of research with production. The inadequate linking of science and technology with economic development is attributed to the legacy of anti-intellectualism practised both by bureaucratic and political leadership in the country.

10.33 There is need to recognise scientists and technologists as indispensable forces in modernisation. A series of institutional reforms, affecting the planning, organisation and management of R&D activities and interaction with science and technology of highly developed countries, have to be conceived and implemented. This alone can bring about a healthy balance between basic research and advanced technology on the one hand, and applied techniques and diffusion of productive innovation on the other. Agriculture, light industry and consumer products have now to become priority sectors for R&D with emphasis on energy saving technology, material science and electronics and computer technology. Alongside, basic research should be expanded steadily and latest developments in science and technology in the rest of the world should be carefully studied and assimilated with our immediate

focus on key problems and projects urgently required for our economic development. Biotechnology is assuming importance outstripping even the computer electronics. Recent advances in genetic engineering are comparable to the revolution that is currently sweeping information technology. Its immediate relevance to India lies in the possibilities it opens up in agricultural productivity. And therefore, we cannot afford to miss this unique opportunity to develop competence in the field which will soon be a major factor in geo-economics. Biotechnology will soon become the critical input in respect of hybrid seeds, tissue culture, genetic engineering, photosynthesis, growth promoters and regulators, bioinsecticides and pheromones, oil seeds, plantations and non-conventional oils, milk production and fish farming. Each of this is unquestionably important since break-throughs in this branch of science would go far to raise productivity and yield, in the above critical items which, despite the green revolution, continue to lag behind those of the advanced countries. The scale of funding necessary in this area of science rules out the private sector as an engine of development and inevitably State funding has to be the mainspring of growth in critical areas like bio-technology, computer electronics, basic sciences, etc. All scientific and technological activities which lead to increased agricultural productivity should be considered as the core economic priority.

10.34 In the administration of science, responsibility has to be shifted from pure bureaucrats to professionals. There is a case for full decentralisation of decision making and allocation of resources. This is to be followed by reforms in the wage system to link remuneration to performance. Science and technology personnel should be provided with

material incentives such as permission to accept advisory assignments or to do research for other units. Meritorious work and output in the field of technology innovations of basic sciences should be encouraged by instituting attractive awards and prizes. This will go a long way to encourage contribution of individual creativity and competition. Technology planning, therefore, has to avoid the danger of over centralisation of decision making which can throttle individual initiative and creativity so important in the innovation pocess. Rigidity and adhocism which are the hall mark of the Indian administration can lead to serious inefficiencies and wastes.

CHAPTER XI

ENVIRONMENTAL CONSERVATION AND MANAGEMENT

Introductory

The concept of ecological planning is a relatively new field. As we become increasingly aware of our limited natural resources, the protection and preservation of nature become our great concern in order to safeguard the quality of life. In the world of today, many human activities disturb the established ecological balance, resulting in the deterioration and degradation of the environment. Industrial and other developmental activities everywhere are causing increasing amounts of air, water and noise pollution and destroying flora and fauna, all of which affect the quality of life to a great extent. Everyday, tonnes of pollutants are discharged into the atmosphere, into our water bodies and on land leading to environmental catastrophies and disasters.

11.2 In this context, the responsibilities of the planners have increased. Whereas, in the past, the planner did not bother about the environmental implications of his schemes, today he has to take all care to preserve the quality of the environment while conceiving developmental activities in order to safeguard the health and welfare of the community at large. The planner has, therefore, the responsibility to assess the environmental impact of development schemes and integrate environmental concerns in the process of planning for economic development. Adequate preventive measures should be integrated in the project to avoid problems of pollution of air, water and land, erosion of soil, waste of limited natural resources, derelict lands, destruction of forests, loss of wild

life, ugly landscapes, urban sprawls and city slums.

11.3 The genesis of the problem of environmental pollution can be traced in particular to the progress of modern civilisation and the higher developmental activities. The problem has grown to such a magnitude in the advanced countries that the desirability of having the fast rate of economic growth employing the present day technology, resulting in higher level of environmental pollution is being questioned. There are two main reasons for the growing conflict between economic and technological advance on the one hand and the quality of the environment on the other. One is rooted in a basic law of nature. It is impossible to add to the material resources with which the world is endowed and impracticable to dispose of waste materials outside the world and its envelop of air. Industry transforms material resources and in doing so depletes some of them and spoils others as a result of the undesirable accumulation of waste products. The second reason is largely economic. In the case of developing countries, environmental pollution, is on the increase, especially on account of the programmes of accelerating the pace of industrialisation, modernisation of agriculture and transportation system and attempts for rapid urbanisation. Already there exists localised areas in these countries where the problem has become both chronic and acute. The concern of environmental pollution has become very relevant in devising developmental strategies for these countries so as to totally avoid or at least to minimise the hazards involved. In short, there exists a built-in conflict in the process of development since most of the known techniques ultimately lead to environmental pollution to a lesser or greater degree.

11.4 The economic reason why society, left to itself, may not strike the right balance between economic output and the quality of environment is that the costs of many kinds of pollution in terms of the increased human suffering, disease, premature death etc. are borne not by the polluters but by someone else. As a result these external costs will not, in general be taken fully into account by the polluters The other aspect is that those who spend money on reducing pollution may not always be the people who gain from the resulting improvement in the environment The consequence is that there is generally not enough incentive or inducement to reduce the amount of pollution per unit of output of the goods and services generated so that enough resources and efforts are not devoted to prevent pollution. The remedy lies in internalising the cost of pollution within the responsible system by suitable regulations designed to reduce or eliminate the pollution. We have to put the cost where it belongs.

11.5 A comprehensive policy for restoring and safeguarding the environment has to be evolved based on hard facts, estimates of cost-benefit, cost-effectiveness and an assessment of what we need and are prepared to pay for. Enough is known already to justify immediate action to control certain kinds of pollution. More facts are however, needed before we can deal with others.

11.6 Pollution of our surroundings occurs wholly or largely as a by-product of man's actions, through direct or indirect effect of changes in energy patterns, radiation levels, chemical and physical constitution, and abundance of organisms.

The changes may affect man directly or through his supplies of water and of agricultural and other biological products, his physical objects or possessions or his opportunities for recreation and appreciation of nature. It is possible to identify different types of pollution and classify them in a systematic manner so as to facilitate deeper study on their harmful effects and abatement methods. One such common classification is to conceive of different types of environmental pollution as falling in three defined categories, namely, (i) water pollution, (ii) air pollution, and (iii) pollution through air, water and land by the purposeful introduction into the environment of chemical substances such as pesticides. By the studies made, mostly in advanced countries, it has been possible to identify and evaluate the immediate harmful effects or different types of environmental pollution but their long term effects are yet to be fully understood.

11.7 Thoughtless and uncontrolled exploitation of the water resources can upset the ecological balance obtaining in a region. Diversion of water courses, creation of lakes, impounding reservoirs, altering the natural regime of rivers can all affect the ecological functions they perform. Activities in the sea can cause sea erosion, silting of harbours and ports, marine pollution, etc. Controlled exploitation of ground water is also necessary to avoid depletion and contamination of these sources. However, with the advancement of economic development and rapid growth of population, water is becoming more and more a scarce commodity. Due to negligence on the part of users, our precious water resources are already polluted in many areas, endangering aquatic life, agriculture, recreation and a variety of other uses of water.

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A. Land and Environment

11.8 'Environment' refers to the sum total of conditions which surround man at a given point in space and time. While the environment of early man was dominated by natural factors such as vegetation, soils, climate and other animals, modern man has increasingly surrounded himself with an environment of his own design and construction, which is geared to the provision of food, shelter and access. There are a number of ways in which the man-environment relationship can be perceived.

11.9 A group of individuals of one kind of organism is called a 'population' and all of the populations living in a given area form a 'community'. The community and the non-living environment with which it interacts is an 'ecosystem'; for example, ponds, streams, forests, etc., are typical ecosystems. If it is considered that all the earth's living organisms are interacting with the physical environment as a whole, then 'ecosphere' or 'biosphere' comes into picture.

11.10 The biosphere, in its operation evolving several thousand million years, has given birth to numerous species and other *taxa biota* of which many continue to live within it. Mankind, however, is bestowed with conscious intelligence which makes him practically 'all powerful'. For its well being and very existence, mankind as consumers is drawing essential resources like air, food, warmth, and energy from the biosphere. Mankind has been completely dependant on the great cycles of biosphere, vast production and ecological integrity.

11.11 The carrying capacity of the biosphere for satisfying humanity may be enhanced by technology, but it may be lowered by its aftermath. The limitations of biosphere are not fully understood or it is difficult to predict with accuracy.

11.12 The greatest threat to the biosphere is perhaps the thermo-nuclear holocaust, followed by the threat of ever increasing population. Some of the aspects to be considered in connection with the environmental conservation and management in India are:

(i) Increasing population, unemployment and consequences of these social problems;

(ii) Economic disparity between the so called rich and poor

(iii) Deforestation and other devegetation trends;

(iv) Soil depletion and erosion phenomena;

(v) Soil salinity and water-logging, especially associated with irrigation;

(vi) Expansion of deserts;

(vii) Coastal erosion;

(viii) Degradation of aquatic ecosystem;

(ix) Carbon dioxide build-up endangering climatic changes; and

(x) Toxic pollution including long-range airborne acidification; and

(xi) Radioactivity.

In addition to the above mentioned factors, various other grave situations may arise, which will cause

problems to the conservation and management of the environment.

11.13 The social and environmental consequences of development works are many, and the resulting effects are often extended much further than the planning area itself. The interaction of diverse forces are often so complex that ecologists and environmentalists are made to predict overall effects. At the current state-of-the art, environmentalists often find it impossible to convince engineers, economists and politicians that certain developments are universal, or of the necessity to spend scarce resources on appropriate remedial measures because of lack of hard facts or solid scientific evidence. In addition, major development projects have been traditionally within the domain of engineers, and consequently social and environmental considerations have often been sadly neglected during the planning processes.

11.14 Much of the excitement that characterised concern about the environment in the late 1960s culminated in the United Nations Conference on Environment held at Stockholm in 1972. The declaration on the human environment was adopted in this conference, listing the principles for international efforts to protect the environment. Subsequent conferences under the auspices of the United Nations and governmental and non-governmental organisations deliberated at length on several components of man's environment and the need for environmental education. Ecology, environment and pollution became topics of debates and discussions all over the world. Slowly, problem-oriented, inter-disciplinary field of study known as environmental science evolved. This relatively new field is marked neither by emotionalism nor by fatalism; rather, it repre-

sents an attempt to assess the environmental problems of the technologically advanced society objectively and rationally. Problems and their possible solutions are studied carefully, and decisions more often involve compromise and co-operation than finger-pointing and reproof.

11.15 Before venturing upon major developmental schemes, it is always essential to go in for an environmental impact assessment; assessment should be before the damage and not later. The environmental dimension must be built into all policies, plans, programmes, projects and decisions. The major components of environmental impact assessment are: (i) identification of actions that require analysis, (ii) identification of relevant project activities, (iii) examination of attributes to be reviewed, (iv) evaluation of impacts considering standard methods and worksheets, (v) summarising impacts, (vi) reviewing other alternatives, (vii) analysis of findings, (viii) preparing analysis document and processing documented analysis.

11.16 Though there are a number of legislations for conserving and managing the environment, certain specific legislations are immediately called for. There should be an effective machinery to enforce legislative measures. Above all, environmental education and awareness programmes should get the priority which they deserve from the Government, educational institutions, mass communication media, social and cultural organisations.

11.17 The present write-up describes the environmental problems with special reference to India and throws light on how some of these problems will have to be tackled. Some of the important

legislations towards environmental conservation and management in the country and elsewhere have been reviewed to serve as a guideline for future steps to be taken in this direction.

(i) Deforestation

11.18 The forest resources are being exploited in an unscientific manner for fuel and other human needs. Large forest areas have been cleared to supply land for various puproses. Though 83 million ha. are classified as forests and permanent pastures, only 35 million ha. out of this area are actually under good tree or grass cover; the remaining 48 million ha. are more or less devoid of vegetation. The national forest policy envisages to keep nearly one-third of the total land under forests.

11.19 The process of exploitation of forests has been accelerated due to: (i) limitations of forest departments in preventing illegal encroachments; (ii) lack of social and environmental awareness among the people and especially the forest contractors; (iii) development of new all-weather roads in the dense forests; (iv) introduction of plantation crops suitable for high altitudes, such as tea, coffee, cardamom, rubber etc. (v) practice of shifting cultivation; (vi) establishment of major development projects in forest areas; (vii) lack of proper planning by the concerned agencies.

11.20 Deforestation has caused a number of environmental problems, namely (i) changes in local climate, (ii) massive soil erosion, (iii) floods, (iv) groundwater depletion, (v) reduction in summer flows, (vi) sedimentation of reservoirs, and (vii) extinction of flora and fauna characteristic of the forest regions of the country.

11.21 The deforestation in the mountainous areas of the Himalayas is a serious problem; the *flora* and *fauna* are affected and the lower Himalayan region is slowly acquiring the characteristics of deserts. The area affected by water erosion in the country is estimated as 100 million ha. The quantity of top soil displaced by water erosion alone is about 6,000 million tonnes/year. Observations show that the average rate of sedimentation in most of the reservoirs in the country is 4 to 6 times more than what has been estimated at the time of design and construction (Table 11.1).

Table 11.1
Sedimentation Rates in some Reservoirs

Project	First Impounding	Estimated life to fill dead storage (Yrs.)	Revised estimated life to fill Dead Storage (Yrs.)	Number of years to fill 50% of live storage
Bakra	1959	88	47	147
Hirakud	1956	100	35	62
Maithon	1957	245	24	60
Manchet	1959	75	12	21
Ramganga	1973	185	47	223
Thungabhadra	1959	36	3	40
Nizamsagar	1931	178	5	35

Source:- Kayastha and Juyal (1979), Man and Forest, Edited by Gupta and Desh Bandhu.

According to the National Commission on Floods, the area affected by annual floods is about 40 million ha. compared to 25 million ha. some 30 years ago. The pasture lands in the country constitute around 13 million ha. and these are subjected to encroachments and overgrazing. The concern of the people and government for the protection of *flora* and *fauna* is evident from the decision to transform the tropical wet evergreen forest of the Silent Valley into a national park.

(ii) Land Degradation and Agriculture

11.22 Table 11.2 shows the pattern of land utilisation as given by National Commission on Agriculture (1976). It is seen from Table 11.2 that about 35 million ha. under cultivable wastes and fallow are capable of production by definition and these lands are presently unproductive apparently because of degradation. About 48 million ha. classified under forests and permanent pastures are also devoid of vegetation. According to the Ministry of Agriculture as much as 175 million ha. equivalent to about 60 per cent of the total area of the country, are affected by degradation caused mainly by soil erosion, water logging, and salinity. Over three-fifths of the agricultural lands are degraded to some degree.

11.23 About 13 million ha. of land have gone out of production due to water logging and salinity; of this nearly half is situated near the coastal belt and estuaries. Of the 13 million ha. affected in this manner, nearly 6 million ha. have degraded because of man-made structures. It would not be unreasonable to assume that atleast 10 million ha. out of the total irrigated area of about 40 million ha. are threatened by water-logging and

Table 11.2
Pattern of Land Utilisation

A r e a (Million ha.)	Year 1970-71	1985	2000
1. Area under forest	66.0	70.0	70.00
2. Area not available for cultivation	45.4	54.0	56.0
(i) Area under non-agricultural uses	16.2	21.5	26.0
(ii) Barren and uncultivable land	29.2	32.5	30.0
3. Other uncultivable land excluding fallows	33.8	32.5	29.0
(i) Permanent pastures and other grazing land	13.3	14.0	15.0
(ii) Land under miscellaneous tree crops and groves not included in the area sown	4.4	5.0	5.0
(iii) Cultivable wasteland	16.1	13.5	9.0
4. Fallow land	19.7	16.5	13.0
(i) Other than current fallows	8.6	7.0	5.0
(ii) Current fallows	11.1	9.5	8.0
5. Net area sown	104.4	145.0	150.0
6. Total reporting area	305.3	318.0	318.0
7. Area for which no returns exist	22.7	10.0	10.0
8. Total Geographical area	328.0	328.0	328.0

Source:- National Commission on Agriculture (1976).

salinity and call for immediate attention. Soil erosion also causes nutrient losses which can be compensated by application of fertilizers at great cost. Primarily because of the environmental problems caused due to degradation of land, the country could barely produce 130 million tonnes of foodgrains from a net sown area of 105 million ha.

iii. Spreading of Desert

11.24 The Thar desert in Rajasthan maintains its leeward creep. It is estimated that the area seriously affected by wind erosion in the country is about 50 million ha. The control of wind-erosion primarily lies in the restoration of vegetal cover to denuded lands by curbing indiscriminate grazing by nomadic herds and the creation of wind-breaking shelter belts. Shifting sand dunes can be stabilized and prevented from smothering vegetation, blocking up roads and chocking irrigation canals in desert areas of Rajasthan. The control of wind erosion also carries with it the hope of ending the aridity of the desert and of a permanent solution to its problems. Studies indicate that one of the possible reasons for moisture laden clouds to pass over Western Rajasthan without precipitating is the fine dust suspended in the air over the desert; of course, this is the direct result of wind erosion.

iv. Mining Activities

11.25 To produce the amount of coal used in one year, nature might have taken about a million years. The main energy source in India continues to be coal. The mining of coal causes serious environmental problems, especially land degradation. The open cast mining in the Jharia coalfields has damaged large areas; projected opencast mines go to a depth of about 300 m. Not only the area lying vertically above the extraction but also surroundings for a considerable distance get affected by mining subsidence. Land is also blocked by refuse heaps. Similar problems are encountered in other mining areas also.

v. Human Settlements

11.26 According to official sources, about

18 million ha. are classified as urban or other non-agricultural uses. About 80 per cent of the population in India live in villages (Table 11.3). The rural population are not generally provided with safe drinking water, sewerage, drainage, etc. There is a large scale migration from rural areas to urban, so much so that large cities in India are doubling every 3 to 5 years. This has created a number of social and economic problems; migrating rural population takes considerable time to be absorbed by urban systems. It is feared that sooner or later about 80 per cent of the low income population of the developing countries (more than half of world urban population) will be living in slums. There is an urgent need for better urban planning and cheaper housing facilities in urban areas. More and more built-up areas are intruding into traditional agricultural lands.

Table 11.3
Some Components of Environmental Quality in Human Settlements

Type of Service	Rural (% of Population)	Urban (% of Population)
Water Supply (protected)	4.3	83
Sewerage (water-borne)	Negligible	38
Drainage (complete or partial)	Negligible	36
Electricity	40	86
Housing:		
Pucca (durable)*	18.9	63.8
Semi-Pucca	37.6	23.5
Kacha (non-durable)	43.5	12.7

*In metropolitan cities about 25-30% live in slums or similar settlements.
Source: National Buildings Organisation (1975)

vi. Coastal Erosion

11.27 Some of the coastal belts in India with its dense population face coastal erosion threats. On the South-West coast of India, this type of erosion has become an annual phenomenon during the monsoon season. The waves, ocean currents, mudbanks, geological factors, and man's interference with natural regime are the main reasons for the coastal erosion. Marine structures constructed by man such as breakwaters, jetties, landing places, groynes, etc. are often accelerating the process. On the East Coast, cyclones have caused loss of land on a massive scale.

vii. Conservation of Representative Terrestrial Ecosystems

11.28 India is endowed with a large number of genetic resources. These are largely found in the forest areas and in other ecosystems, such as mountains, marshes, swamps, grasslands, deserts and aquatic ecosystem. Though the country has a number of national parks and nature reserves for the protection of natural areas and endangered plants and animals, some of the endemic species are disappearing. In the absence of trained personnel and people with awareness of ecosystem, wildlife sanctuaries and parks will never function satisfactorily.

11.29 Some of the areas which should be transformed into nature reserves and national parks are: North Eastern Hill region (rich in plant and animal species including rare legumes and medicinal and ornamental plants); Rishi Ganga basin areas including the Nanda Devi sanctuary in the Himalayan region (significant for typical alpine *flora* and *fauna);* Wynad-Karnataka plateau comprising the

wildlife sanctuaries of Mudumalai, Bandipur, Wynad and Nagarhole (for their rich *flora* and *fauna)*; desert areas like the Mount Abu, Jaisalmer-Barmer belt and Bharathpur and Ranthambore sanctuaries. Other areas of importance from ecological point of view are: Silent Valley in Kerala, Flower Valley in U.P., Simplipal Hills in Orissa, Rarvati and Panga Valleys in Himachal Pradesh. Conservationists must protect the natural resources of these areas which are in danger due to human interference.

B. Water and the Environment

11.30 With the gradual increase in the world population there has been corresponding need to provide more food, fibre, energy and raw materials. Also, as cities and industries developed, much of their waste was discharged into the water courses with little or no treatment, which reduced the quality of receiving waters. A direct result of such developments was a demand for more water for domestic, agricultural and industrial purposes; at the same time the quality of much available water near centres of population deteriorated due to pollution. Hence development and rational management of water became a primary necessity.

11.31 All development projects have environmental and economical consequences, and water development is no exception. Whether such consequences are acceptable or not are often matters of great controversy and depend very much on the individual concerned, their personal interests, views and biases.

i. Impact of Major River Prodjects on the Environment

11.32 Since the social and environmental effects of water resources development are many,

it can be best discussed by dividing the effects into three categories of subsystems-physical, biological and human as illustrated below.

PHYSICAL SUBSYSTEM

Hydrological System	Atmospheric System	Crustal System
Water quantity	Evaporation	Geology (soil mineral content,
Level	Micro-climate	structure)
Discharge		Earthquake
Velocity		
Groundwater		
Losses		
Water quality		
Sediments		
Nutrients		
Turbidity		
Salinity and alkalinity		
Temperature stratification		

BIOLOGICAL SUBSYSTEM

Aquatic Eco System	Terrestrial Eco System
Benthos	Submerged land and vegetation
Zoo plankton	Draw down zone
Phyto plankton	Zone above high water level
Fish & aquatic vertibrates	Failure impacts
Plants	Loss of animal habitat
Disease vectors	Food-chain implications

HUMAN SUB SYSTEM

Production System	Socio-cultural System
Agriculture	Social costs
Fishing and hunting	Political implications
Wild life	Anthropological effects
Recreation	
Energy	
Transportation	
Manufacturing	

Physical Subsystem

11.33 Water development projects invariably change river and ecosystem regimes, and thus the real question is not whether such developments will affect the environment, but how much change is acceptable to society as a whole, and what counter-measures should be taken to keep the adverse change to minimum, at a reasonable economic cost.

11.34 The possibility of inducing earthquakes by construction of large dams is another environmental problem that has not received adequate attention so far. Several recent studies indicated that some of the observed seismic activities near the reservoirs can be attributed directly to the creation of dams and storage reservoirs. It also appears that the height of the water column is a more important parameter in inducing earthquakes than the total volume of the reservoir. The Koyana incident in India has thrown light on the possibilities for earthquakes by human activities.

Biological Subsystem

11.35 Water resources development can affect the biological sub system in many different ways and the effects can be either beneficial or adverse. Since the quality of water is of prime importance to human health, the availability of potable water to much of mankind is literally a matter of life and death. Using the water resources for irrigation and hydropower generation is also beneficial to society.

11.36 One of the most serious impacts of irrigation developments in the tropical and semi-tropical regions is the secondary effect of spreading water-borne diseases and the consequent suffer-

ing of millions of human beings and animals. Irrigation schemes have often enhanced or created favourable ecological environments for parasitic and waterborne diseases such as filariasis, malaria, etc.

11.37 Aquatic weeds also can be the result of water resources development, especially in the tropics and semi-tropics. In terms of water availability and efficiency of water use, weeds are a great nuisance. Loss of water occurs due to two principle reasons. Firstly, a large amount of water is necessary in the canals for flow augmentation in order to ensure adequate quantity of water in the lower reaches. Secondly, water losses are greatly enhanced by evapotranspiration from the weeds. These two factors often account for a tremendous amount of water loss. Control of aquatic weeds in the tropics and semi-tropics, especially after invasion, is a difficult and expensive task. Mechanised or manual clearing of weeds, especially in shallow waters, has been quite successful, but in deep waters it is not a very viable alternative. Weeds thus removed can be used to produce animal food, biogas or manure. Chemical herbicides have been extensively used to control weeds. The third type of control is biological, wherein fish, snails or aquatic grasshoppers are introduced to control weeds. There is still much to be learnt concerning the use of biological controls.

11.38 Submergence and cutting of forests with the coming of major water resources schemes affect the forest ecosystem.

Human Subsystem

11.39 The impact of water development on the human subsystem could be direct or indirect,

stemming from direct effects on physical and biological subsystems. These impacts can either be beneficial or adverse.

11.40 Provision of drinking water, irrigation, hydro power, etc. is undoubtedly major benefits of water developments. Major beneficiaries of the availability of potable water will be the women of the developing world, who currently spend considerable time in carrying water and collecting firewood.

11.41 All impacts on the human subsystem due to water developments, however, are not beneficial. Many of the effects mentioned under the sections on physical and biological subsystems also have impacts on the human subsystem.

11.42 Many of the major water development projects have also created other human problems, especially in terms of displacement of local inhabitants. Resettlement of population due to water development projects in many developing countries has not been a satisfactory experience. Inadequate planning, insufficient budget, incomplete execution of plans and little appreciation of the problems of technology transfer have all contributed to the failure of plans.

11.43 About 1073 ha. of forest land was cleared in increasing the command and rehabilitation areas for the Panam Reservoir Project (Gujarat). Symptoms of large-scale soil erosion in the catchment of Panchana Project (Rajasthan), formation of levees and delta type features due to the excessive siltation in Jawai Bundh Project (Rajasthan) are some of the ill effects of major water resources projects. Nearly 9312 ha. of land from 24 villages

was submerged because of Shetrunji Reservoir (Gujarat) affecting 19,000 people. Inundation reduced the capacity of the Morel Reservoir (Rajasthan). According to Irrigation Commission, about 14.4 lakh ha. in Haryana and 10.9 lakh ha. in the Punjab are already waterlogged. Some of the examples quoted herein illustrate how the major irrigation projects cause environmental degradation in the catchment, reservoir and the command area.

11.44 The addition of environmental quality in recent years to the other traditionally accepted objectives of water resources development - economic efficiency and regional income redistribution - has made the planning process more complex than before. Existing analytical techniques available for making planning decisions cannot effectively cope with the social, ecological and environmental concerns. Damages to the environment caused by the construction of a dam, whether to the beauty of a canyon or to the countryside, or to the overall ecology, cannot be analysed by the fine tuning of marginalism. This approach cannot be successfully used where benefits are short run and quantifiable while the costs are long-run and often unknown and unquantifiable.

ii. Estuarine Ecosystem

11.45 The estuarine ecosystem mainly at the river mouths, believed to be the cradle of life, is highly disturbed due to human interference. The indiscriminate discharge of industrial effluents and domestic sewage to the estuaries situated in the thickly populated coastal belts have threatened the estuarine flora and fauna, which are neither marine nor riverine. The man made structures like ports, harbours, break-waters, etc. cause considerable ecological changes. The control and regulation

of water flowing into the estuaries make them either more saline or more fresh. Nothing can replace the natural flushing of these water bodies.

11.46 The Hooghly estuary is facing severe pollution and salinity intrusion problem. The Vembanad backwater, one of the largest complex estuarine systems of the Malabar Coast, is facing a number of problems due to human interference. Some of the problems caused to this water body are due to: (i) construction of a barrage across this estuary to prevent salinity intrusion; (ii) flood water regulation through an artificial spillway; (iii) coir retting activities; (iv) discharge of water from the paddy fields containing insecticides, fertilizers, etc. (v) reduction in flow from the rivers draining into this water body due to water resources development schemes upstream; and (vi) dredging and other activities at the mouth, where Cochin harbour is situated. The agricultural production, fish catch, quality of water, etc. have been considerably affected. The example of the Vembanad is given to illustrate how complex is the management of estuarine ecosystem.

iii. Lake Ecosystem

11.47 All lakes share one characteristic: in the context of geologic time (thousands to millions of years) they are relatively short-lived. Lakes in India are aging mainly because of their gradual filling by sediment load. Plant debris is particularly abundant in aged lakes where nutrient-rich waters spur luxurient growth. This process of aging through nutrient enrichment is termed as eutrophication. The deforestation in the catchments of lakes and reservoirs cause considerable soil erosion and silting up of the lakes. Dumping

of wastes rich in plant nutrients has speeded up the aging processes in some of the lakes of India. The aging accelerated by such human activities is termed as cultural eutrophication. The Chilka, one of the largest natural lakes of the country, has been reported to be undergoing ecological changes. A number of high altitude lakes in the country also deserve conservation measures.

iv. Marine and Coastal Environment

11.48 The exclusive marine economic zone of India, which extends to a distance of 200 nautical miles (370 Km.) from the shore, has an area of about 2 million sq. km. This area is about 60% of the total land area of the country. The country has a coastline of about 6000 km. The important causes of marine pollution are: disposal of domestic sewage, industrial effluents, pesticides and insecticides, spilling of oil from tankers and bilge washing, etc. Certain pollutants undergo transformation by different chemical and biological processes in the ocean, while some do not undergo any change (persistant pollutants). Mercury in marine environment can be biomagnified one million times before it reaches man through his food; the same process takes place for most of the pollutants.

11.49 The domestic sewage added to the Indian seas by coastal population is about 35 km^3/yr; industrial effluents from coastal industries are about 3.5 km^3/yr and through river runoff about 0.1 km^3/yr. Tar deposition from the Kutch to the Kanyakumari for the year 1975 was about 1,000 tonnes.

C. Energy And The Environment

i. Energy Resources

11.50 As a result of the reckless use of

non-replaceable, non-replenishable sources of power and energy, by the industrial nations for the last two centuries, a fuel shortage of unprecedented magnitude is faced by the present generation. Table 11.4 gives the sector-wise energy consumption in India.

Table 11.4
Energy Consumption in India

Sector	Energy (kilo Calories xlo^{12})	Percentage to Total
Industry	345	22.4
Transportation	160	10.4
Govt. & Commercial	35	2.3
Agriculture	30	2.0
Urban & Domestic	83	5.3
Rural Domestic	890	57.4
T o t a l	1643	100.0

Source: Fuel Policy Committee Report (1974).

11.51 The main energy source in India is the coal reserves; coal is extensively used for steel manufacture, railways, thermal power stations, domestic cooking and for a number of industries like cement, brick, paper, textile, chemicals, etc. The mining of coal and the particles and smoke from the coal cause various environmental problems.

11.52 The other sources of energy used in India are oil, nuclear fuels, hydroelectric power and non-commercial sources of energy such as fire-wood, agricultural wastes, cow-dung, solar and wind energy, etc.

11.53 Oil refineries contribute to considerable pollution. World wide oil production is expected to begin dropping in the 1990s.

11.54 The hydroelectric projects and dams should ensure full protection to the nature and forest cover. The catchment areas should not be disturbed. The planning and selection of sites should be based on ecological considerations.

11.55 In India, there is an urgent need to explore the possibilities for biogas, solar energy, wind energy, tidal energy, etc. which will have minimum impact on the environment.

ii. Nuclear Energy

11.56 Over the next several decades, nuclear fuels will be used extensively to meet electrical energy demands, possibility of catastrophic accident exists due to exploitation of nuclear energy; fear of radioactivity from nuclear energy is well known. Therefore, nuclear wastes require special handling and disposal techniques. The principal radioactive isotopes of zirconium, niobium, cerium, paesodymium and ruthenium, all are having a half-life of one year or less. Radioactive caesium and strontium, especially isotopes of Cs^{137} and S_r^{90} are a good deal more troublesome, with half lives of thirty and twenty eight years respectively. S_r^{90} is suspected to cause leukaemia. However, radioactive wastes have a property not shared by most other pollutants; after a certain period the harmful properties disappear.

iii. Noise Problem

11.57 Use of energy and noise problem go

hand in hand. Noise interferes with people's lives in different ways: repeated interference with sleep, effect on hearing, effect on communication, effect on mental and physical health, etc. Noise pollution is generally caused by traffic; from engine and transmission, exhaust noise, brake sequeal, use of horn, aircraft noise, etc. In addition, construction and civil engineering works, industries, etc. contribute to noise pollution. A number of methods are available to reduce noise pollution and separate legislation in this direction is called for in the Indian context.

D. Water Pollution

i. Causes

11.58 Historically, water borne diseases were the primary water pollution concern. Chlorination of water supplies has effectively controlled this danger in some urban areas, but the concern is still relevant with regard to the rural areas. Coliform bacteria are used to indicate whether water is polluted with waterborne pathogens.To minimize the threat, waste water effluents are also chlorinated in developed countries.

11.59 The decomposition of organic wastes in water by bacteria and fungi results in depletion of dissolved oxygen in water. The concentration of organic material in water is measured by the biochemical oxygen demand (BOD). Surface waters, experiencing decreased levels of dissolved oxygen, are inhabited by undesirable pollution-tolerant organisms.

11.60 Municipal treatment plant effluents, some industrial effluents, and runoff from urban

and agricultural areas contain significant quantities of aquatic plant nutrients. Phosperous and nitrogen compounds are nutrients that accelerate the eutrophication process. Water quality in eutrophic water bodies is impaired for industrial and municipal use as well as for desirable aquatic life.

11.61 Many chemical wastes are directly toxic to aquatic life. Some chemicals in water at extremely low concentrations become problems through food chain accumulation. For example, mercury accumulates in fish to levels above the limit for edible fish.

11.62 Oil spills cause direct harm to birds and aquatic organisms. Chronic effects of compounds in oil, resistant to breakdown, are poorly understood.

11.63 Heated water discharges may exceed the temperature tolerance limits of some aquatic organisms. Withdrawal of cooling water for power plants may kill fish on intake screens and increase rates of nutrient cycling in reservoirs.

11.64 Eroded sediments fill reservoirs, lakes, harbours, and navigational channels. In addition, suspended sediments impede photo-synthesis, cover bottom-dwelling organisms, destroy fish spawning areas, and carry nutrients to water bodies.

11.65 The quality of groundwater is primarily controlled by purification processes that occur as water infiltrates soil. Areas with thin soils over fractured bedrocks are especially susceptible to groundwater contamination. Septic tank systems in suburban areas can pose a serious threat to groundwater quality.

ii. Some Problems in India

11.66 The officially recorded serious case of water pollution is that of jaundice epidemic in Delhi (1956). The Ganges was set aflame due to oil pollution in 1968. Certain rivers like the Damodar in Durgapur-Asansol region, the Hooghly near Clacutta, the Ganges at Kanpur and Matu at Baroda, Kalu and Ullahas near Bombay and Cauvery near Erode are grossly polluted and show signs of deterioration due to industrial developments.

11.67 On the banks of the Hooghly estuary alone, there are nearly 159 industries; 78 jute mills, 12 textile mills, 7 tanneries, 5 formidable pulp and paper factories, 4 large distilleries and 53 other industries. A BOD load of 52 tonnes per day from these industries (from 4.4×10^5 m^3/day of water) are being dumped into the Hooghly system.

11.68 The Ganges at Kanpur receives domestic waste waters from 1.5 million people living in Kanpur along with waste waters from 45 tanneries, 10 textile mills, 3 woollen mils, 2 jute mills and a number of chemical and pharmaceutical industries.

11.69 In Bombay, the Kalu river near Kalyani once a spawning ground for Hilsa fish is no more so; biomagnification in aquatic organisms form a source of danger to the human beings who consume the fish.

11.70 Another source of water pollution in the country is the agricultural runoff - non-point source of pollution - with the increased use of inorganic fertilizers. In some regions in the country, the groundwater has already reached excessive levels of pollution.

iii. Remedial Measures

11.71 In addition to enforcement of law, a few remedial measures can be adopted to maintain water quality;

(i) Establishing primary and secondary sewage treatment plants;

(ii) Treatment of drinking water supplies;

(iii) Accident prevention training to combat spills of harmful substances;

(iv) Artificial recharge of groundwater to augment natural recharge;

(v) Encouraging water conservation practices; and

(vi) Enhancing the sanitation facilities.

E. Air Pollution

i. Causes

11.72 Many industrial sources contribute to air pollution; pulp and paper mills, iron and steel mills, oil refineries, smelters, and chemical plants are steady producers of pollutants. Additional pollutants come from motor vehicles, fuel combustion by industries and households, refuse burning, and various agricultural activities. Some of the primary air pollutants are: sulphur oxides, nitrogen oxides, hydrocarbons, carbon monoxide, particles etc. Some of these materials undergo chemical reactions in the atmosphere to become secondary air pollutants, which include acid mists and smog (aerosols).

11.73 In sufficiently high concentrations, some air pollutants are asphyxiating agents and others severely irritate respiratory tract. Much evidence indicates that air pollution threatens human health, although specific cause-effect relationships are difficult to isolate.

11.74 Little is known about the impact of polluted air on the well-being of non-laboratory animals, although cases of lead and fluride poisoning have been reported. Pollutant damage to vegetation primarily takes place when certain gases enter leaf pores. The tolerance varies considerably with the plant species and type of pollutant.

11.75 Formation of ozone in the stratosphere protects life on earth by filtering out harmful intensities of ultraviolet radiation. This ozone shield is threatened by the halocarbons accumulating in the atmosphere. Human activities influence the climate of large cities by altering the local radiation balance; in some cases this effect gives rise to an urban dust dome.

11.76 Air pollution can enhance cloudiness and rainfall. In localities, where air is polluted by oxides of sulphur or nitrogen, rain becomes strongly acidic; acid rainfall threatens aquatic life and corrodes structures.

11.77 The frequency of atmospheric conditions that favour air stagnation and hence reduced air quality varies from place to place with the seasons. Conditions that favour the accumulation and concentration of pollutants in air are countered to some extent by gravitational setting and washout by rain and snow.

ii. Indian Scene

11.78 Industries are a major source, polluting air and water. India is world's tenth largest industrial power and the country has achieved self sufficiency in a number of industries, like textiles and chemicals such as soda and sulphuric acid, iron and steel, cement, food etc. In the caustic soda industry, mercury cell electrolysis is being replaced by membrane cell process to reduce pollution and energy consumption. The industry has an annual installed capacity of over one million tonnes distributed among 35 units. Present day consumption of plastics (both new and processed) is around 450,000 tonnes annually. There are about 10,000 small scale plastic manufacturing units, producing a wide range of plastics worth Rs.350 crores.

11.79 The Indian drug industry is well developed producing Rs.665 crores worth of bulk drugs and Rs.2,450 crores of formulations. Most of the basic drugs are made from the basic stage, and required raw materials, chemicals and intermediates and solvants are indigenously available.

11.80 'Green Revolution' encouraged more production of chemical fertilizers, pest control chemicals, modern agricultural tools, etc. India produces 60,000 tonnes of pesticides and has an installed capacity of 98,000 tonnes. The formulation industry has also developed and there are 800 of them at present.

11.81 Consumption of fertilizers in India stands at 7.2 million tonnes of nutrients a year, recording a seven fold increase during the past 17 years. Six new gas based fertilizer plants will be coming up soon.

11.82 The rapid industrialisation and unplanned human settlements are mainly causing water and air pollution and other forms of degradation of ecosystems.

11.83 The toxic gas leakage from the Union Carbide factory at Bhopal has caused a number of deaths and other hazards to nearby human settlements. Recently Bombay has experienced smog conditions; the level of suspended particle matter rose upto 300 microgram/m^3. About 13,000 tonnes of pollutants are discharged into the air at Bombay; sulphur dioxide in the air is of the order of 70-80 microgram per m^3. Studies carried out at Waltair revealed acid rain conditions; rain water having a P^H of 3.3 and 3.9 during October 1982 and January 1983 has been observed. This may be due to existing zinc smelting plant, where no air pollution control methods are adopted. Sulphur dioxide in the smoke has been found to be a serious menace to the historical monuments, especially the Taj Mahal.

iii. Some Remedial Measures

11.84 In addition to enforcement of law, the following precautionary measures may be taken to prevent air pollution:

(i) Building taller smokestacks and dispersing industry in rural sites;

(ii) Introducing scrubbers, electrostatic precipitators, filters, and collectors;

(iii) Reuse of collected air pollutants as much as possible;

(iv) Control of automobile emissions through modification of internal combustion engines; and

(v) Creating awareness among all concerned.

iii

Environmental Legislation and Awareness Programmes

i. Constitutional Provisions

11.85 The need for environmental preservation has been recognized and stressed in the Constitution of the country. Article 48(A) of the Directive Principles of the Constitution for instance, makes it the responsibility of the State 'to protect and improve the environment and to safeguard the forests and wildlife of the country'. Article 51A(g) makes it a duty of the citizens to protect and improve the natural environment including forests, lakes rivers and wildlife and to have compassion for living creatures'. The same concern has been shown while formulating the Five Year Plans; for example, the Sixth Plan document emphasises '..... plan will ensure that projects and programmes which are likely to cause unacceptable environmental damage are not taken up .....'.

ii. Population Policy

11.86 Considering the necessity for controlling the fast growth of population, Government of India have announced a National Population Policy; besides 'family welfare schemes', stress has been given on education of the masses on the need for limiting the size of the family. Emphasis is now more on persuasion than on compulsion.

iii. National Forests Policy

11.87 About 23% of the total area is classified under forests and a legislative framework exists

to protect the forests from destruction. 'Forests' and 'Protection of Wild Animals and Birds' have been included in the concurrent list of the Constitution (17A and B of the list). There are proposals to revise the policy specifying a minimum percentage of land under forests in the whole area and a higher percentage in hilly areas.

iv. Industrial Policy

11.88 Government of India have decided not to issue licences to new industrial units within certain limits of large metropolitan cities having a population over one million and urban areas with a population over half a million. Before sanction, environmental assessments are also done. Under the Registration and Licencing of Industrial Undertaking Rules, it is obligatory to indicate *a priori* the adverse environmental effects of the projects and how it is proposed to tackle the same. National Committee on Environmental Planning and Coordination (NCEPC) has set up Environmental Appraisal Committees for the scrutiny of new projects; new projects are referred to them. NCEPC, a broad-based multidisciplinary body, is to review, formulate and promote policies and programmes covering development projects, physical planning, legislation, administrative procedures, research, etc. This Committee has played a major role in formulating legislation on environmental protection, in developing guidelines for different sectors, etc. At the State levels also similar bodies are functioning.

v. Legislation

11.89 Efforts are made to create legislative framework for environmental protection. There are legislations for sectors like preservation of water quality, protection of wild life, preservation

of trees and parks, land use planning, clearance and improvement of slums, control of insecticides, protection of cultural property, control of marine pollution, safe disposal of radio-active wastes, protection against environmental degradation due to mining, etc. A bill for preservation of air quality also has been passed by the Parliament.

11.90 The Water Preservation and Control of Pollution Act provides for the constitution of Central Water Pollution Board and State Boards. These Boards are monitoring rivers, lakes and the effluents from industries. A Motor Vehicles Act is also existing. Merchant Shipping Act and Maritime Zones Act are related to the marine pollution. The legislation on toxic substance is also in force. Indian Standards Institution has published a number of specifications which are of use for environmental management.

vi. Environmental Education & Awareness Programmes

11.91 Though there are a number of acts and legislations in India to protect, to conserve and to manage the environment, some of them are not effective because of the reasons, such as lack of efficiency and dedication among agencies enforcing the acts and legislation and the lack of public awareness. Though there are a number of colleges and universities offering degree level and post-graduate level courses on various aspects of environment, there are only a few institutions which give stress to the multi-disciplinary nature of the problem. While some of the courses concentrate only on biological or chemical aspects, others emphasise only on engineering aspects. Environmental studies are neglected by most of the polytechniques,

which produce practically oriented technical personnel. At the primary and secondary level of education, text-books and teachers often fail to make the student community aware of the environmental problems around them. Inservice training programme on environmental aspects are rarely conducted. Formal education could not do much in moulding environmental experts with a good vision and perspective. Environmental awareness also could not be fully inculcated among the younger generation. As a result of all these, an efficient core of scientists, technologists, planners, decision-makers and public, aware of the environmental problems, are lacking in the country. However, agencies like NCERT have developed some material for environmental education.

11.92 There are a number of desperate, uncoordinated ventures all over the country aiming at imparting environmental awareness among people through seminars, symposia, conferences, etc. However, most of these attempts do not achieve the desired results because of the limitations of organisers and participants. In such assemblies, often local problems are exaggerated beyond proportions.

11.93 The mass communication media is doing a good service in the country to inculcate environmental awareness. News papers through attractive news items on environmental problems and through popular articles on the subject have been playing a major role.

11.94 Audio-visual media are also becoming effective in imparting environmental education. There has been a trend among some novelists, poets

and dramatists to enlighten the public on different environmental aspects through their works.

The environmental education and awareness programmes by the non-formal agencies like Chipko Movement, Apikko Movement, Bombay Bachao Committee, Taj Mahal Protection Movements, Silent Valley Protection Committee, etc. have been effective. Such Committees and Movements can easily influence the masses.

11.96 We have described above the nature of the damage potential from the most common and most serious pollutants, in the context of an industrial society. It is important to have an understanding of why environmental damage is likely to be caused by certain activities, in order to be aware of the nature of the costs imposed. A number of alternative categorisations of pollutants is possible, and different classes of damage can be identified.

11.97 Environmental degradation is undesirable because it imposes costs upon members of society. It may prevent human enjoyment, preclude particular activites, or ultimately even threaten the continued existence of mankind. The damaging effects of various pollutants described in this chapter should be prevented, if the costs they impose on members of society are too high. Of course, with that kind of pollution which has long-term adverse effects on the ecological balance, the costs of degradation are very high indeed, and it is hard to make out a case for permitting its continuance. This, however, only serves to emphasize the perspective into which scientific information must be placed. Decision-making means making choices, and one must choose between the environmental costs of pollution

and the loss of benefit from not pursuing the polluting activity.

11.98 Scientific and technological inputs are essential to environmental decision-making because they provide the physical information necessary for estimating and comparing the costs of alternative strategies. In this we turn to the problem of evaluating the costs and benefits of particular forms of environmental amenity and assess the extent to which it is meaningful and useful to attach monetary values to such items.

11.99 In any development there is always some amount of environmental degradation. This was quite realised by Pandit Nehru as far back as 1957 and he said "we have many large scale river valley projects which are carefully worked out by engineers. I wonder, however, how much thought is given before the project is launched to having an ecological survey of the area and to find out what the effect would be to the drainage system or to the *flora* and *fauna* of that area. It would be desirable to have such an ecological survey of these areas before the project is launched and thus avoid an imbalance of nature". Yet it is a sad fact that our politics and administration did not develop a culture of pollution control and most of us believe that there is more money in destroying environment than in conserving it.

11.100 Resources shrink as people multiply. While we account for 15% of the world population we have only 2.4% of the land area. The future population growth, therefore, has to be related to the resource base. Since there is an upper limit to the availability of land, our carrying capacity will naturally be determined by the availability

of food, water, land, energy, etc. which means that the birth rate must come down to the level of zero growth of population.

11.101 Land is the most important component of the life support system. There are a number of competing demand on land like farming, forestry, grasslands, transport and urban and industrial developments. Our statistics on these are most unreliable and has to be up-dated meticulously through using modern tools like remote sensing and micro-level land use survey. The total scenario of land will need to be built up carefully and backed by appropriate legislations. The idea is to redeem this nature's gift from past damage with a view also to insulate it from future damage. A connected problem is watershed management. Our present water regimes in the mountain ranges are threatened with depletion. If the science based reclamation work is not quickly attempted, sediment loads in our rivers and reservoirs will become very high - affecting food production, industrial activity and even drinking water. Further, the loss of top soil is the maximum in India, being 18.5% of the total soil loss at the global level. Hence it is necessary to reduce this loss on a priority basis. Our grass lands and their over grazing have been responsible for ecodegradation. Our excessive and productivity wise poor live-stock and their population explosion have led to various environmental consequences. The effective forest cover is dangerously low being hardly 14% of the geographical area, when it should have been 33% in the plains and 60% in the hills. Proper management of woodlands and its revegetation would call for proper conservation, production and a people-oriented social forestry programme. Conservation forestry will cover natural vegetation in watersheds

and fragile ecological regions where no commercial exploitation should be allowed. Simultaneously, there must develop a production forestry aimed at meeting the raw material demands of forest based industries and fuel needs of the villages. A lot of low productivity agricultural lands may be released for the purpose and if we could introduce modern scientific management in this area of production forestry, we could increase both production and productivity substantially. Industrial forestry can be developed in a big way in India by applying principles of genetics, plant protection, tissue culture and bio-technology. Social and Agro-forestry can be organised on popular lines with a multi-purpose use for food, timber and fodder. Such a programme has to be location specific and therefore very helpful to the rural poor. Once people are made conscious to see the advantages for them in a village based mass-social forestry programme, it will be possible to integrate agriculture, forestry and animal husbandry at the village level. Therefore, our society should take to tree planting as an article of faith and not as a ritual with full participation of the people backed up by a scientific information system and science and technology activity.

11.102 The biological wealth of the country is very rich with nearly 45,000 plants and 65,000 animal species. These have to be conserved in space and time for which we need a strategy based on principles of genetics and evolutionary biology. The protection of species and varieties that are gene-rich is very important and, therefore, protected - area-management will become a major enterprise for saving valuable genetic wealth. The country must take to science based conservation of natural

sites as also biological diversity in plants, trees, animals and micro organisms on land, water and marine environments.

11.103 Energy is a very important input for development and there is a correlation between level of development and amount of energy used by the country. No nation can now afford to depend on only one form of energy. It has to use biomass, solar, coal, petroleum, natural gass, hydro and nuclear in a healthy proportion. This should be backed by fool-proof environmental safeguards. There is need for a good measure of R&D input in all forms of energy use In the immediate future the country will have to conserve this commercial sources on the one hand and replace and supplement the same with non-conventional sources on the other Since all resources are a trust of the present generation, which it owes to generations to follow, our present methods should lead to maximum saving of energy These resources are, therefore, to be used carefully through development of technologies for recycling of wastes and residues. Almost all the developed countries like the U.S.A., Germany, Japan and the Soviet Union are very active in the area of recycling and reuse. Recycling and reuse have been extensively used as a way of life in China. All biomaterials available at the village level are recycled and used by China with considerable social economic and environmental advantages.

11.104 Due to nearly doubling of population from 1951 to 1981, there has been a 300 per cent increase from 77 to 221 persons/sq.km., our human settlements are becoming centres of pollution and environmental degradation. It is estimated that our population in slums will go up from 28 million

to 55 million by 1990 unaccompanied by any planned water supply and sanitation system. The refuse pollutes water body and causes problems of environmental sanitation. If we are serious of improving the living conditions of the weaker sections of the society, it is important that the life styles of the urban people become less energy demanding and less consumptive in character. There is also an immediate need for R&D with regard to utilisation of all locally available building materials and appropriate architecture consistent with local environment and other parameters for environmentally compatible human settlement.

11.105 The country badly needs environmental education at all levels. The people are themselves a renewable resource and we need to train them so that they could help to restore our environment. We should introduce a new approach from the kindergarten to the University in environmental education which cuts across varied subjects so that environmental bias permeats into all facets of one's life and does not get compartmentalised. Formal and non-formal education should combine to make every living member of our society aware of the real life situation and the need for a comprehensive conservation policy to ensure a level of development which could be sustained. A sustainable society should see that resources are not depleted and environment is not degraded.

Conclusion

11.106 The question of environmental harmony has become a real concern even at the level of common man. The rapid extinction of the various species of life on Earth is no longer the pathetic

concern of a few isolated scientists. It has spread today into a planetary issue threatening even the very survival of human species on earth. How to educate man in order that he participates with his environment and with his neighbour in the most harmonious manner for the benefit of both, has become a recurring question in societies which are taking up the challenge to reconsider the ethical norms that eventually lead to the fulfilment of humanity's highest aspirations To create a positive planetary awareness is becoming an urgent task of the educationists the world over We should ensure that India will participate in the regenerating process of humanity's holistic mind by nutralising and by gradually superceding the plague of violence and terror so that the attention of humanity will be drawn more and more to a tangible possibility of a peaceful and harmonious world

v
Appendix

11.107 The 1970s have witnessed the growth of international efforts to control pollution A major step in this direction was the convening in Stockholm in June 1972 of the United Nations Conference on the Human Environment. Some 114 countries - the U.S.S.R and East Germany were the major absentees - were represented at the conference, which resolved to set up a United Nations environmental organisation The United Nations Environment Programme (UNEP) was promptly created with headquarters in Nairobi, Kenya. UNEP has gotten off to a modest start with a small budget (about $100 million for its first five years). The conference delegates also hammered out a Declaration on the Human Environment with 26 principles.

Declaration on the Human Environment

i) Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality which permits a life of dignity and well-being, and bears a solemn responsibility to protect and improve the environment for present and future generations. In this respect, policies promoting or perpetuating aparthied, racial segregation, discrimination, colonial and other forms of oppression and foreign domination stand condemned and must be eliminated.

ii) The natural resources of the earth including the air, water, land, *flora* and *fauna* and especially representative samples of natural ecosystems must be safeguarded for the benefit of present and future generations through careful planning or management as appropriate.

iii) The capacity of the earth to produce vital renewable resources must be maintained and whenever practicable restored or improved.

iv) Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat which are now gravely imperiled by a combination of adverse factors. Nature conservation including wildlife must therefore receive importance in planning for economic developments.

v) The non renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to insure that benefits from such employment are shared by all mankind.

vi) The discharge of toxic substances or of their substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems. The just struggle of the peoples of all countries against pollution should be supported.

vii) States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

viii) Economic and social development is essential for insuring a favourable living and working environment for man and for creating conditions on earth that are necessary for the improvement of the quality of life.

ix) Environmental deficiencies generated by the conditions of underdevelopment and natural disasters pose grave problems and can be remedied by accelerated development through the transfer of substantial quantities of financial and technological assistance as a supplement to the domestic effort of the developing countries and such timely assistance as may be required.

x) For the developing countries, stability of prices and adequate earnings for primary commodities and raw material are essential to environment management since economic factors as well as ecological processes must be taken into account.

xi) The environmental policies of all States should enhance and not adversely affect the present or future development potential of developing countries, nor should they hamper the attainment of better living conditions for all, and appropriate steps should be taken by States and international organizations with a view to reaching agreement on meeting the possible national and international economic consequences resulting from the application of environmental measures.

xii) Resources should be made available to preserve and improve the environment, taking into account the circumstances and particular requirements of developing countries and any costs which may emanate from their incorporating environmental safeguards into their development planning and the need for making available to them, upon their request, additional international technical and financial assistance for this purpose.

xiii) In order to achieve a more rational management of resources and thus to improve the environment, States should adopt an integrated and coordinated approach to their development planning so as to insure that development is compatible with the need to protect and improve the human environment for the benefit of their population.

xiv) Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and improve the environment.

xv) Planning must be applied to human settlements and urbanization with a view to avoiding

adverse effects on the environment and obtaining maximum social, economic and environmental benefits for all. In this respect projects which are designed for colonialist and racist domination must be abandoned.

xvi) Demographic policies, which are without prejudice to basic human rights and which are deemed appropriate by governments concerned, should be applied in those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects in the environment or development, or where low population density may prevent improvement of the human environment and impede development.

xvii) Appropriate national institutions must be entrusted with the task of planning, managing or controlling the environmental resources of States with the view to enhancing environmental quality.

xviii) Science and technology, as part of their contribution to economic and social development, must be applied to the identification, avoidance and control of environmental risks and the solution of environmental problems and for the common good of mankind.

xix) Education in environmental matters, for the younger generation as well as adults, giving due consideration to the underprivileged, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension. It is also essential that mass media of communications avoid contributing to the deterioration of

the environment, but, on the contrary, disseminate information of an educational nature on the need to protect and improve the environment in order to enable man to develop in every respect.

xx) Scientific research and development in the context of environmental problems, both national and multinational, must be promoted in all countries, especially the developing countries. In this connection, the free flow of up-to-date scientific information and experience must be supported and assisted, to facilitate the solution of environmental problems: environmental technologies should be made available to developing countries on terms which would encourage their wide dissemination without constituting an economic burden on the developing countries.

xxi) States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to insure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

xxii) States shall cooperate to develop further the international law regarding liability and compensation for the victim of pollution and other environmental damage caused by activities within the jursidiction or control of such States to areas beyond their jurisdiction.

xxiii) Without prejudice to such general principles as may be agreed upon by the internation-

al community, or to the criteria and minimum levels which will have to be determined nationally, it will be essential in all classes to consider the systems of values prevailing in each country, and the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries.

xxiv) International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential to prevent, eliminate or reduce and effectively control adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.

xxv) States shall insure that international organizations play a coordinated efficient and dynamic role for the protection and improvement of the environment.

xxvi) Man and his environment must be spared the effects of nuclear weapons and all other means of mass destruction. States must strive to reach prompt agreement, in the relevant international organs, on the elimination and complete destruction of such weapons.

CHAPTER XII

ADMINISTRATION FOR DEVELOPMENT

During our independence struggle, our national leaders were convinced that foreign subjugation of India for centuries was due to the political and social divisiveness in the country. They had the vision of "one nation", in which all people would be equal and there would be no discrimination on grounds of religion, language, caste or sex. They were of the firm belief that the age-old poverty of the people of India could be removed only through the establishment of an egalitarian and democratic society. Under the leadership of Mahatma Gandhi, they took the noble view that "means" were as important as "ends". The ends of freedom and development did not justify adoption of any means. The means themselves had to be right. The Indian National Congress adopted the democratic form of functioning. The first generation of political leaders participated in the administration of local bodies and thus became used to the democratic methods of functioning. As a result, when we became politically independent, we adopted a constitution based on the principles of equality and democracy. Considering the numbers of people involved, it was perhaps the biggest, peaceful political and social revolution in the history of mankind. It is a measure of the prescience of our national spirit of our people that, unlike in several other countries around us, the system chosen by them has survived the initial years of development as an independent country. This is a matter of pride for us and we should do everything in our power to carry forward what has been achieved during the last nearly 40 years.

12.2 In order to do this, we have to remind ourselves of the basic tenets of the system and recognise the weaknesses that have developed over the years so that remedial measures can be taken For, like freedom, democracy cannot be taken for granted. What are the basic tenets of the system?

12.3 Broadly speaking, there are four types of administrative systems in the world. The first is the old, traditional system, which was prevalent throughout the world till about the 18th century. It was the monarchical system in which the king determined laws and administration was benign or autocratic, according as the ruler was Its modern-day equivalents are the dictatorships by military-men/jantas The second system is the one that was in vogue in the early years in the United States of America, namely, the spoils system The political party that came into power appointed its own members as officials and public servants at all levels of Government and with a change in the Government, everybody had to change. There was no permanent civil service. The third system is the Soviet system, prevalent in all Communist countries, in which there is no distinction between the party and the Government. It is a one-party system under which all public servants have to function. The fourth system is the one that prevails in all democracies, namely, administration by elected peoples' representatives through permanent and neutral civil servants. The civil servant is not expected to be committed to any political party but is committed to the public good and to the constitution of the country. In practice, in each one of the above four systems, there is some element of the other but the dominant nature of each system is clear.

12.4 The type of administrative system depends upon the political system adopted by the country. In India, since we have adopted a multi-party democratic system with freedom of speech and association, it is the fourth type of administrative system that we have. In a system in which different political parties can come to forward at different times, a neutral and permanent civil service is essential in the interests of stability and objectivity and for upholding the rule of law.

12.5 The basic tenet of a democratic system is that no one is above law and that the rule of law is paramount. Peoples' representatives make laws through discussions and ultimate acceptance by a majority. Once the laws are framed, as also the rules and regulations under them, they have to be implemented in an objective and predictable manner, so that there is no arbitrariness or discrimination between similarly-placed citizens. Any citizen aggrieved with executive action, on grounds of denial of fundamental rights or arbitrariness or unfairness, can approach the judiciary, which is independent of the executive. The executive is thus accountable for its actions.

12.6 Rule of law, objectivity, predictability and accountability are the four pillars of administration in our democratic system. The two major weaknesses that have developed, which have had an adverse impact on administration and development are:-

(i) the absence of decentralisation, and

(ii) the growth of an informal system

Absence of Decentralisation

12.7 The question of decentralisation can be studied at two levels "Centre-State" and "State-Local Bodies". According to our Constitution, India is a union of States. It lays down the powers of the Union and the States. In the discussions in the Constituent Assembly and its Committees regarding the principles of our Constitution, the different alternatives - a unitary State, a federation with a strong Centre and with residuary powers vesting in the Centre or a federation with a larger powers for the States - were all considered. One of the early Committees set up by the Constituent Assembly was the Union Powers Committee with Shri Jawaharlal Nehru as its Chairman. That Committee recommended that "the soundest framework of our Constitution was a federation with a strong Centre with residuary powers vesting in the Centre". When the Report of that Committee was discussed in the Constituent Assembly, strong views were expressed for and against larger powers for the States. The general scheme suggested by the Comittee was finally adopted.

12.8 After the Constitution was brought into effect, the country undertook national planning for development. Jawaharlal Nehru, who took over the reins of Government was of the firm belief that it was only through planning that speedy development of the country could be brought about. Planning for the country as a whole implied laying down targets for all sectors of development, undertaking massive central investment both in infrastructure and in basic industries and laying down national programmes so that all parts of the country could be brought up to a certain minimum level.

All this meant that the Union Government's area of influence and operation got extended to all subjects coming under "development". The separation of powers and subjects between the Union and the States, as laid down in the Constitution, got increasingly blurred. The preparation of the national plan covering all development subjects, the clearance required for the State plans from the Planning Commission and the Central Ministries, the determination of central assistance and the size of the State Plans from year to year, the introduction of centrally-sponsored schemes and the procedures for approving irrigation, power and industrial projects, have all led to a high degree of administrative and financial centralisation. This was further enhanced by the concentration of savings through the nationalised banks and the central financing institutions. The issues relating to finance and development have, therefore, become the most important ones to be discussed in the context of Centre-State relations. The challenge facing the polity of the country is how to balance the requirements of planning for national development on the one hand and those of local initiative and local participation on the other. There is considerable scope for improvement in the institutional arrangements for planning, for dealing with Centre-State issues, for devolution of larger resources to States commensurate with their increased responsibility and for more equitable inter-State distribution. There is need for evolving new conventions and procedures for Centre-State consultations. All this is now before the Sarkaria Commission and it is hoped that as a result of the labours of that Commission, Centre-State relations would be put on a healthy and progressive basis, consistent with the need to preserve the unity and integrity of the nation and to foster rapid and balanced development of all parts of the country.

12.9 The weaknesses that have developed in "State-Local Body relations", are much greater During the freedom struggle, our national leaders repeatedly stressed the importance of villages and panchayats in our lives. Over and above this, urban local bodies based on the 19th century British model were started and, as stated earlier, many of the national leaders had their initial administrative training in them. In the directive principles of the Constitution, the State is enjoined to organise village panchayats and endow them with such powers and authority as may be necessary to enable them to function as units of self-government. In the list of subjects coming under the purview of the States, 'local government'(*) is included. Beyond these two references, however, there are no substantive provisions in the Constitution regarding local bodies.

12.10 The need for a strong system of local government has been stressed from time to time and in addition to the earlier rural and urban bodies, decentralised bodies to deal with development have been suggested at the district and sub district (block level). Several Commissions and Committees have gone into it starting from the Balvant Raj Mehta Committee in the '60s and ending with the GVK Rao Committee in 1985. Panchayat Raj institutions, as they were called, were formed in a number of States at the district and sub-district levels. The experience with the functioning of local governments and the relationship between the State and local governments have not, however,

(*) Local government, that is to say the constitution and powers of municipal corporations, improvement trusts, district boards, mining settlement authorities and other local authorities for the purpose of local self-government or village administration.

been happy. Partisan interests have prevailed over public interest and in an environment of scarce resources the State Governments have been extremely reluctant to make over resources to local government institutions. Many people, mainly political leaders, turned to the view that in the conditions prevailing in our country it was the State and Central Governments which were responsible to the people and therefore it was better to go in for development directly under them rather than creating more elected bodies.

12.11 The result of all this has been that the traditional local bodies have atrophied and the new Panchayati Raj institutions have not taken roots. They withered very early in their lives. Elections have not been held to local bodies and Panchayati Raj institutions in many States for a number of years. Peoples' participation, which is one of the corner stones of our system, is, therefore, not there at local levels in any significant degree. What is there officially is an advisory role to ascertain the needs and reactions of the people. In practice, the participation takes place in the form of pressures by individuals and groups on decision-makers - on civil servants in the field and on the Members of the Legislature and the Ministers at the State level. The present situation calls for fundamental thinking on the need for and the role of local governments in our system.

12.12 Anyone who has planned and implemented programmes directly affecting the lives of the people, as in rural and community development, human settlements, implementation of large irrigation and agricultural programmes as well as programmes of reforms, comes to realise that peoples' participation at local level is necessary, not

merely for smooth and speedy implementation and achievement of the objectives of the programmes but also because lack of participation results actually in alienation of the people in many cases.

12.13 To a considerable extent, the dilemma about decentralisation arises from different perceptions of the role of decentralised bodies based on historical precedents. Historically, four broad types of local government can be recognised.

(1) Traditional : Characterised by its largely indigenous character and mostly at the village level;

(2) English : Characterised by elections, local autonomy and decentralised functions through legislation;

(3) French : Characterised by central control and participation between higher and local levels of Government; and

(4) Soviet system : Characterised by "Centralised decentralisation" controlled by a single party, the local levels being lower tiers of the Government.

12.14 We have been very much under the influence of our historical precedent - the 19th century British model. When the question of establishment of decentralised bodies for area development is considered, we have followed that model, which was failed to serve even the traditional civic

purposes and has been given up in most countries. Since we are undertaking planning for national development in a democratic frame-work, the most suitable system seems to be the partnership system, somewhat on the lines of French local authorities, in which the national (and State) Governments and the local authorities do not have exclusive jurisdictions but function as mutually dependent partners and who share a unity of purpose. In India, if extreme positions are excluded, we have brought about this partnership system, to a considerable extent, in the relationship between the Centre and the States. We should carry it forward to the relationship between the State Governments and local authorities.

12.15 Following from the older approach, the attempt has been to earmark subject areas for local authorities. Thus, whenever decentralisation is mentioned, school education, health services, agriculture and related subjects are automatically mentioned as subjects to be given over to local levels. A little reflection shows that hardly anything can be decentralised in some of these subject areas - even in elementary education, for example, the language, the syllabus, the text books, the qualifications and salaries of teachers, criteria for opening schools have all to be laid down at the State level on the basis of need for uniformity and on financial considerations. It is clear that only some functions in each subject area can be decentralised to local levels.

12.16 Another aspect of the approach so far followed is that, while discussing decentralisation, it is assumed that comprehensive planning is possible at the district and local levels. In a system

of planning for national development, the scope and area of influence of planning at the State and local levels is necessarily limited. The experience so far is that while, at the level of discussions and in statements of objectives or policies, the plea is for comprehensive decentralisation to district and local levels, in practice, as stated earlier, there has been very little decentralisation. On the other hand, vertical departments have grown in size and numbers. The result is that even in a field like rural development, a large number of departments function in respect of a particular activity like Animal Husbandry. In the implementation of a single scheme like distribution of heads of cattle, a number of agencies with a variety of schemes are operating in the field. This leads to considerable wastage, confusion and corruption. It is necessary, therefore, to devise an arrangement by which horizontal coordination and decentralisation will be achieved at the district and local areas atleast in specified fields of development.

12.17 The preparation of plan schemes by departments and their implementation through vertical agencies from the Centre/State level to the village level has led to the adoption of an attitude of "delivering" things to the people, as if development is a one way street. The assumption (though unsaid) is that the Government agencies and the departments know all the answers to all the problems of developments and that the people should only be at the receiving end of development. One of the main reasons for the failure of many of the schemes to achieve their objectives or to ensure benefits for the intended groups of people, is this approach to development administration. It is essential to rebuild local and community capabilities and a sense of responsibility. Very special

measures have to be taken for this purpose. The concept of "capacitation" of society is important in this regard. Under that concept, development is not viewed merely as delivery of services and goods or as implementation of pre-determined projects and schemes, but as a process in which one of the main objectives will be to assess present conditions and capacities of existing institutions and to work towards progressive improvement of their capacities, by giving them more and more responsibilities. As in the case of individuals, so in the case of groups and societies, it is by progressive assumption of responsibility that confidence and capacity will grow. Society and its institutions should grow by trial and error and by re-acting to situations as they emerge and, all the time, with a full sense of responsibility. Most people behave responsibly if they are made clearly responsible. For too long, excessive regulation on the one hand and spoon-feeding on the other has gone on encouraging irresponsibility, lack of accountability and centralisation. A conscious process of "capacitation" requires to be started immediately.

12.18 In the light of the above considerations and on the basis of the lessons of past experience, the following scheme of decentralisation is suggested for adoption.

(i) There should be substantive provisions in the Constitution regarding local Government institutions and the conduct of elections for them once in 5 years. Traditional urban and Panchayat level local bodies should be strengthened. In addition, for area development, there should be decentralised bodies below the State level.

(ii) There must be a clear understanding about the levels below the State level at which decentralised planning and implementation will be done. While the 'District' is generally accepted, there is no clear or unequivocal acceptance of the 'Block' below the district. The Block should be declared to be the unit of planning and development below the district levels. There seems to be no need for a level between the State and the District.

(iii) Comprehensive planning is not possible at the district and lower levels. The limits of planning at these levels should be understood. They should be concerned only with "Rural Planning and Development".

(iv) Even under "Rural Planning and Development", four types of programmes can be recognised, regarding which the functions will vary at these levels:-

a) Local area-based and household-based economic development schemes;
b) Local infrastructure schemes (Land Development, Minor Irrigation, Rural Roads, Rural Electrification etc.);
c) Social service including establishment of institutions (Education, Health etc.); and
d) Social Welfare and Social Security Schemes.

A considerable part of the responsibility for planning and implementation of (a) and (b) will ultimately devolve on the district and block level. In respect of (c) & (d), their respon sibility will be largely for advice and co ordination of implementation.

(v) Rural Planning and Development will aim at the preparation and implementation of a coordinated set of area development and beneficiary (family-oriented) schemes and programmes. Plans will have to be prepared taking into account one or two lead sectors of economic activity in the area and will include Land Use Planning, Land Development, Agricultural (including Animal Husbandry, Dairying, Poultry Fisheries, etc.) activities relating to the area, rural industries and for the connected rural infrastructural (Rural Roads, Rural Electrification, Rural Housing, Minor Irrigation, etc.). Public participation and involvement of voluntary agencies will have to be enlisted to the maximum extent possible. It will be seen that the usual mention that is made, when discussing decentralisation, of subjects like education and health are not made here.

(vi) For discharging the functions under (iii) above, a competent group of development staff will have to be assembled at the block level. The training and orientation of the staff are essential prerequisities.

(vii) As regards, rural development programmes, there should be no parallel departmental staff at and below the level of the block. Technical staff at the block level should be the agency used by all in so far as the rural development programmes are concerned.

(viii) There should be arrangements for High Level Coordination Committees at the State and Central Government levels whose clearance

should be obtained before any scheme connected with the rural development is introduced by any Ministry. This is essential in order to ensure that different Ministries do not introduce and sanction overlapping schemes.

(ix) Decentralisation will have to be implemented in stages. During the first stage, it is essential to bring about the structural changes in the governmental organisations and changes in work methods including financial and budgetary procedures. This stage will be the stage in which planning and coordination will be done by administrative agencies of the government and the main objective will be administrative coordination. At this stage, non-official participation will be in a consultative/advisory capacity in sanctioning schemes, deciding locations and in reviewing progress.

(x) In the second stage, elected bodies should be set up. It is a matter for consideration, according to the circumstances in each State whether elected bodies will be set up both at the district and the block levels, or in only one of the two levels. It seems to be clear that creating elected bodies without making the structural changes necessary for administrative coordination will lead to the functioning of parallel agencies as before and ultimately to the atrophy of decentralised institutions.

Growth of Informal System

12.19 While discussing the administrative system, an important question that arises is whether

the system we inherited from the British was a sound one. Admittedly, that system was devised to serve the interests of the imperial power. Its functions were limited, namely, the maintenance of Law and Order, the collection of taxes and the performance of a few other regulatory functions. In the discharge of the responsibilities, the civil service was accountable only to the superiors and to Government. There is no doubt that the system, as a whole, was unjust, discriminatory and stagnant. Different rules applied to different groups of people. But within the overall limitations and within each group, the rule of law, such as as it was, prevailed. It was considered a matter of honour to uphold them among the members of the sub-system. That people should even now refer nostalgically to "those days" in matters relating to administration, shows the importance that they attach to efficiency and objectivity in administration.

12.20 With the coming of independence, there was a sea change in the environment and we have referred earlier to the democratic system that we have consciously adopted. Along with the changes in the political system, there was a phenomenal increase in the range and volume of Governmental activities. Despite its limited role in earlier years, the civil service did respond positively to the new demands placed on it. When the volume of nature of activities increased suddenly, it was inevitable that there was some fall in quality. There was no time available for giving adequate training to all levels of the bureaucracy in the emerging fields of responsibilities.

12.21 Coupled with the failure to bring about sufficient decentralisation to which we have referred to earlier, the rapid increase in the size of the bureaucracy and its responsibilities meant that reforms and reorganisation within the system have been few and far between. Many of the old modes of functioning have continued and have not been adjusted to the new situation or to the changes brought about by development itself. The rights guaranted in the Constitution also led to stalling of attempts of reforms and reorganisation by the interested groups in the bureaucracy frequently by taking recourse to the writ jurisdiction of courts. The rigidities of the system and the presumed interests of small groups and individuals have come in the way of even minor reforms. Half the time is also spent in managing its own affairs and even in this there are so many lapses, that there are lakhs of cases pending before High Courts.

12.22 The formal administrative system that we have adopted has thus suffered from the ills of rapid growth in size and functions, fall in quality and lack of reform.

12.23 A parallel development which has seriously affected administration, is the growth of an "informal" system, which has been eating into the vitals of the formal system. We have referred in earlier chapters to the growth of black money in the economy. The informal system in administration is analogous to it. In the administration as a whole, in the administration of taxes, in regulatory agencies and even in police administration, the informal system has gradually enlarged its domain. Whether or not to raise demand and collect the tax, whether or not to take coercive measures to

collect arrears, whether to give exemption from the professional, technical and safety standards in matters of licensing, are the types of cases which have come under its control. In some States, it has spread into the sphere of maintenance of Law and Order, criminal investigation and prosecution. Police Officers await informal signals before taking action in a given situation.

12.24 The informal system has been most evident in development administration, in the selection of beneficiaries, in the grant of licences and State assistance and subsidies and in the relationship between the Government and the public undertakings. What the informal system does in all these cases is to give directions and instructions contrary to the rule of law, the statutory provisions and the declared policies and programmes of the Government itself. At first, the informal instructions were being given only by a few political executives in power, here and there, but gradually the system seems to have become pervasive and instructions are given by personal staff of Ministers and local representatives of political parties, and vested interests and power brokers acting in their name. The system that is thus emerging is only a hair-breadth away from the "party-cell" administration of communism.

12.25 The adverse consequences of the growth of the informal system are all around us. When decisions are taken under "pressure", arbitrariness increases and objectivity and predictability, which are the very essence of democratic administration, suffer a great deal. The affected people take increasing resort to the courts, clogging them with lakhs of cases. There is a serious erosion of the

sense of responsibility and accountability on the part of the bureaucracy. Nobody can be held responsible for proper functioning and, therefore, efficiency of service to the people declines. Corruption spreads to all levels of the administration and is now believed to be pervasive and widespread. Little wonder, therefore, that people generally believe that nothing can be got done, unless someone is "spoken to" or some consideration is given.

12.26 Above all, morale and motivation amongst its members, which are vital for successful functioning of any administration, and especially so in an administration for development, are very low. This is because of the conflicting demands of the formal and informal system on the administration. The administration is judged and criticised by the public, the press, the legislatures and the Parliament and their Committees on the basis of the sophisticated and exacting requirements of our formally adopted system. At the same time, in its day-to-day working, it is under constant pressure of the informal system to do just the opposite, under threat of displeasure, most commonly expressed through 'transfers' and in many cases, through vindictive action for technical lapses in working the formal system (which lapses are inevitable, if anything at all is to be got done). Different elements of the bureaucracy have reacted differently to this situation. The honest and straight-forward among them have become passive and gone into a shell and do not take any initiative or show any dynamism. Those amongst them, who got hurt in spite of their caution have become totally cynical. An increasing number has become dishonest in many ways. Instead of performing their duties impartially and efficiently, they have aligned

themselves with political, communal and caste groups and seek and get their protection for all their acts of omission and commission. We have the sad situation in which the honest are passive and dishonest active! The nuber of those, who are both honest and active, efficient and dedicated, has grown less and less. It is indeed a miracle that, as a result of their pluck and some luck, so many of them are still left in the administration. What little is performed is in no small measure due to them, who are present at all levels of administration, from the top to the bottom. The challenge facing us is how to increase their numbers.

12.27 It is clear that the influence of the informal system should be severely circumscribed. Political executives in power and political leaders and workers in the field should give serious thought to the State of our administration. The term "depoliticisation of administration" has sometimes been used in this context. In the minds of many political executives and leaders, this term has the connotation that the supremacy of the political executives will be lowered and that the bureaucracy would become all powerful. That is not the intention at all. The object of "depoliticisation" is to insist that political executives and leaders do not interfere with the day-to-day working of the administration by putting pressure and giving directions and signals contrary to the rule of law and the declared policies and programmes of the Government, but to insist on their efficient and honest implementation. Instead of joining forces with interested groups and individuals, whose only purpose is to subvert the rule of law and get undue benefits for themselves, they should play to the strengths of the formal system that we have adopted.

Viewed in this light, "depoliticisation" of our administration is long overdue.

12.28 At the same time, basic reforms have to be brought about within the formal system. A firm stand should be taken against obstructions to reforms arising from within the bureaucracy. The services have to be made more professional and imbued with a sense of dedication and service to the people. The laws for punishing the dishonest and the inefficient should be recast and the institutional arrangements and procedures changed. It should be possible to reward the honest and efficient and as a first step, they should be protected from the evil effects of the informal system. Institutional arrangements should be made for this also.

12.29 A simultaneous effort to improve the formal system and to severely curtail the informal system will lead to the emergence of an administration attuned to our ideals and to development.

APPENDIX - I

NOTE ON POPULATION

India's population as per 1981 census is 684 million* - a growth rate of 25.0 between 1971 and 1981. In absolute terms, India's population has increased by 135 million during the decade. It has doubled itself since independence. During 1921-81, our population has increased by 172 per cent from 251 million to 684 million. The world population during this period rose by 114 per cent only. The 1981 census has belied our hope that deceleration in the rate of population growth has already started (Table I.1).

2. Infant mortality has declined by more than 15% since the turn of the century. Expectation of life at birth has increased from 27 years in 1921-31 to about 46 years in 1961-71 and to 50 years in 1971-81.

3. A feature of population with high growth rate is the relatively high proportion of young people. Over two-fifths of the Indian population is below 15 years of age. Only 6 per cent of India's population is over 60 years of age. There are more males than females in India. The number of females for 1000 males has been declining and was 941 in 1961 and 935 in 1981.

4. In 1981 nearly 24 per cent of the population were living in urban areas. The rate of increase in urban population rose from 8 per cent in 1011-21 to 38 per cent in 1961-71 and 47 per cent

*The post-enumeration check has revealed a net omission rate of 1.8 per cent and if provision is made for this population of India in 1981 will be 697 millions.

in 1971-81. The process of urbanisation will get intensified in future through the process of economic development.

5. The overall density of the country is 221 persons per sq. km. in 1981. It was just 81 in 1921. West Bengal and Kerala have the highest densities of 614 and 659 persons per sq.km. respectively among the States.

6. The population has nearly doubled from 361.1 million in1951 to 683 million in 1981. The Northern Zone has experienced the highest growth rate (110.6 per cent) whereas the Southern Zone had the lowest growth rate of 74.3 per cent. Eastern Zone doubled itself during this period whereas the Central Zone recorded a growth rate of 82.5 per cent. The growth rate was very fast in majority of the Union Territories and smaller States like Manipur, Meghalaya, Nagaland, Sikkim and Tripura (Table I.2). During 1971-81, North Zone and South Zone have taken the respective position of highest and lowest growth rates. All Southern States except Karnataka had rates below average. Other States which experienced low growth rate were Kerala, Maharashtra, Orissa and West Bengal.

7. The urban population growth rate was 34.0 per cent during 1951-60. It rose to 38 per cent in1961-71 and 47 per cent in 1971-81 which is an all-time record. This fast urban growth rate was partly the result of emergence of almost 200 new towns and partly from the net rural and urban migration besides its own natural increase. There is a declining trend in the rate of growth of rural population. There has been a decline in the rate of growth of rural population in States like Haryana, Punjab, Karnataka, Maharashtra, Tamil Nadu

and Gujarat The State of Kerala is a peculiar case Almost 80 per cent of the rural population lives in villages of 5000 - 10000 population, which could be classified as urban. This State has the minimum rate of natural increase in population compared to all other States in India. The industrialised States of Maharashtra, Tamil Nadu, Gujarat and Karnataka have 30 per cent or more of their population as urban.

8. Literacy is an aspect which would merit special consideration. If Chandigarh and Delhi which are highly urbanised are left out, Kerala has a pre-eminent position with regard to literacy and it has maintained its position in all the Census years. There has been a steady increase in literacy in the country over the last two decades (Table I.3).

9. Structure of employment in Indian economy has shifted away from agriculture. The census data at the disaggregated levels of industry divisions, major and minor groups and occupational levels support the claim that the shift away from agriculture may have taken place due to positive growth factors (Table I.4).

10. The evidence on per worker net domestic product as well as the distribution of factor incomes suggests that the shift in the structure of employment has benefited a majority of the work force (See Table I.5 & I.6). If we compare the share of employee compensation in factor incomes in 1971 and 1981 its share has increased in primary, finance and real estate, community and personal services and for the economy as a whole. It shows a decline in secondary, transport, communication and trade. The shift in employment away from agriculture may be reflective of a shift in private expenditure away from food to non-food items.

Table I.1

Trends in Demographic Rates in India 1911 - 1981

Decade	Birth rate	Death rate	Population at the end of period (Million)	Percentage of urban population to total	Density per sq. km.	Sex ratio
1	2	3	4	5	6	7
1901-11	49.2	42.6	252	10	82	964
1911-21	48.1	47.2	251	11	81	955
1921-31	46.4	36.3	279	12	90	950
1931-41	45.2	31.2	319	14	103	945
1941-51	39.9	27.4	361	17	117	946
1951-61	41.7	22.6	439	18	138	941
1961-71	41.2	19.0	547	20	177	930
1971-81	N.A.	N.A.	684	24	221	935

Source:- Office of the Registrar General of India.

Table I.2

Population Growth During Successive Periods By Zones, States - All India, 1921-1981

Zone/State / Union Territory	1921-51	1951-81	1951-61	1961-71	1971-81
1	2	3	4	5	6
I N D I A	43.67	89.37	21.52	24.57	24.98
I. Northern Zone	43.87	110.64	25.70	28.29	30.62
1. Haryana	33.31	126.49	33.79	31.91	28.34
2. Himachal Pradesh	23.74	77.62	17.87	22.83	22.70
3. Jammu & Kashmir	34.21	83.84	9.44	29.37	29.85
4. Punjab	28.07	81.99	21.56	21.49	23.23
5. Rajasthan	55.17	113.53	26.20	27.57	32.64
6. Chandigarh	33.791	775.00	394.13	113.33	75.78
7. Delhi	257.06	255.27	52.44	52.35	32.95
II. Eastern Zone	43.39	97.10	26.06	25.19	24.90
8. Assam	73.15	147.89	34.98	34.91	36.14
9. Arunachal Pradesh	37.88	80.04	19.76	38.28	34.76
10. Bihar	50.42	148.10	35.04	21.13	24.11
11. Manipur	43.39	119.14	27.03	0.28	34.02
12. Meghalaya	34.11	262.91	14.07	31.21	31.62
13. Nagaland	31.25	79.38	19.82	39.57	50.10
14. Orissa	68.53	128.99	17.76	24.88	19.88
15. Sikkim	109.91	222.38	78.71	29.01	51.20
16. Tripura	50.51	107.17	32.80	35.90	32.73
17. West Bengal	14.34	506.45	105.19	26.62	23.21
18. Andaman and Nicobar Islands	NA	NA	NA	79.69	63.48
19. Mizoram	100.00	148.98	35.61	20.30	52.50

1	2	3	4	5	6
III. Central Zone	35.61	82.54	18.85	22.28	25.60
20. Madhya Pradesh	35.99	99.95	24.17	28.40	25.42
21. Uttar Pradesh	35.45	75.35	16.66	19.59	25.68
IV. Western Zone	54.97	100.08	26.52	27.94	25.63
22. Gujarat	59.83	108.82	26.88	29.11	27.49
23. Maharashtra	53.49	95.91	23.60	27.19	24.62
24. Dadra and Nagar Haveli	33.77	153.66	39.56	27.59	40.50
25. Goa, Daman & Diu	19.00	81.54	5.14	36.52	26.40
V. Southern Zone	46.58	74.34	16.96	22.67	21.52
26. Andhra Pradesh	45.26	71.63	15.65	20.70	22.76
27. Kerala	45.03	90.92	21.57	26.04	19.24
28. Karnataka	73.66	87.49	24.76	23.99	26.66
29. Tamil Nadu	39.26	60.35	11.85	22.09	17.43
30. Pondicherry	54.25	90.48	14.61	27.64	28.24
31. Lakshadweep	29.94	90.54	16.34	33.22	25.00

Table I.3

States/Union Territories Arranged in the Order of Literacy Ranking in 1981 Census and Comparison with 1971 & 1961 Census

Ranking in 1981	State/Union Territory	Literacy rate			Ranking in 1971	Ranking in 1961	Percentage increase of literacy	
		1981	1971	1961			1971 to 1981	1961 to 1971
1	2	3	4	5	6	7	8	9
1	Kerala	69.17	60.42	46.85	2	3	14.48	28.96
2	Chandigarh	64.68	61.56	51.06	1	2	5.07	20.56
3	Delhi	61.06	55.61	52.75	3	1	9.80	5.42
4	Mizoram	59.50	53.79	44.00	4	4	10.90	21.70
5	Goa, Daman & Diu	55.86	44.75	30.75	6	8	24.83	45.53
6	Lakshadweep	54.72	43.66	23.27	7	15	25.33	87.62
7	Pondicherry	54.23	46.02	37.43	5	5	17.84	22.95
8	Andaman & Nicobar Islands	51.27	43.59	33.63	8	6	17.62	29.62
9	Maharashtra	47.37	39.18	29.82	10	11	20.90	31.39
10	Tamil Nadu	45.78	39.46	31.42	9	7	16.02	25.59
11	Gujarat	43.75	35.79	30.45	11	9	22.24	17.54
12	Manipur	41.99	32.91	30.42	14	10	27.59	8.19

1	2	3	4	5	6	7	8	9
13	Nagaland	41.99	27.40	17.91	19	23	53.25	52.99
14	Himachal Pradesh	41.94	31.96	21.26	15	17	31.23	50.33
15	Tripura	41.58	30.98	20.24	17	19	34.22	53.06
16	West Bengal	40.88	33.20	29.28	13	12	23.13	13.39
17	Punjab	40.74	33.67	26.74	12	13	21.00	25.92
18	Karnataka	38.41	31.52	25.42	16	14	21.86	24.00
19	Haryana	35.84	26.89	19.93	20	20	33.28	34.92
20	Orissa	34.12	26.18	21.66	21	16	30.33	20.87
21	Sikkim	33.83	17.74	NA	27	..	90.70	NA
22	Meghalaya	33.22	29.49	18.47	18	21	12.65	59.66
23	Andhra Pradesh	29.94	24.57	21.19	22	18	21.86	15.95
24	Madhya Pradesh	27.82	22.14	12.13	23	25	25.65	29.25
25	Uttar Pradesh	27.38	21.70	17.65	24	23	26.18	22.95
26	Dadra & Nagar Haveli	26.60	14.97	9.48	28	27	77.69	57.91
27	Binar	26.01	19.94	18.40	25	22	30.44	8.37
28	Rajasthan	24.05	19.07	15.21	26	26	26.11	25.38
29	Arunachal Pradesh	20.09	11.29	NA	29	..	77.95	NA

Source:- Registrar General of India, Census of India Series Paper 1 of 1983.

Table I.4

Net Domestic Product at Factor Cost by Industry of Origin, Per Main Worker (At 1970-71 Prices)

Industry/ Division	NDP in Rs.crores 1970-71	Income per main worker (Rs.)	NDP in Rs.crores 1980-81 (at 1970-71 prices)	Income per main worker (Rs.)
1	2	3	4	5
Agriculture	16354	1330	18977	1282
Forestry, logging, fishing	626	1625	630	1262
Mining, quarrying	327	3601	472	3734
Manufacturing:				
(a) Registered	2874	5654	4424	6121
(b) Unregistered	1745	1476	2633	1470
Public utilities	318	6069	647	6643
Construction	1853	8508	2250	6311
Trade, hotels, restaurants	3880	4505	5859	4816
Transport	1574	3660	2875	4737
Finance, insurance	1683	14084	2695	15278
Services:				
(a) Administration	1635	3343	3588	5853
(b) Other services	1650	1660	2185	1758
Total	34519	1959	47235	2123

Source:- Reserve Bank of India, "Report on Currency and Finance, 1983-84".

Table I.5

Share of Employee Compensation in Factor Incomes 1971 and 1981

Sector	Share of Employee Compensation in Factor incomes (%) 1971	1981
1	2	3
Primary	22.56	24.77
Secondary	57.69	51.76
Transport, Communication, Trade	40.76	36.60
Finance & Real Estate	26.50	33.36
Community & Personal services	87.43	90.16
T o t a l	38.71	40.86

Source:- Central Statistical Organisation, "National Accounts Statistics 1970-71 - 1981-82" January 1984

Table I.6

Private Final Consumption Expenditure in Domestic Market By Object (At 1970-71 Prices)

(Per cent)

Item	1970-71	1980-81
1	2	3
1. Food, beverages, tobacco	68.4	62.5
2. Clothing and footwear	7.2	9.8
3. Gross rent, taxes, fuel and power	7.1	6.9
4. Furniture, furnishing, household equipment etc.	2.9	3.5
5. Medical care and health expenditure	2.0	2.7
6. Transport & communications	5.0	7.1
7. Recreation entertainment, education & cultural services	3.6	3.5
8. Miscellaneous goods and services	3.8	4.0
Total	100.0	100.0

Source:- Central Statistical Organisation, "National Accounts Statistics, 1970-71 - 1981-82", January 1984

Appendix II.1

Five Year Plans - Outlays/Expenditure for Public Sector

(Centre, State & Union Territories) (Rs crores)

Heads of Development	First Plan (1951-52 to 1955-56)		Second Plan (1956-57 to 1960-61)		Third Plan (1961-62 to 1965-66)		Annual Plans 1966-67 to 1968-69		Fourth Plan (1969-70 to 1973-74)	
	Plan provision	Actual expenditure	Plan provision	Actual expenditure	Plan provision	Actual expenditure	Approved Outlay	Actual expenditure	Approved Outlay	Actual expenditure
1	2	3	4	5	6	7	8	9	10	11
1. Agriculture & Allied Services & Cooperation	354	290	568	549	1099	1089	1117	1090	2728	2320
2. Water & Power Development	648	583	925	882	1710	1917	1490	1678	3535	4286
3. Industries and Minerals	188	97	890	1125	1792	1967	1670	1637	3631	3107
4. Transport & Communication	570	518	1385	1261	1511	2112	1273	1237	3237	3080
5. Social & Community Services	532	412	945	769	1309					
6. Economic & General Services & Miscellaneous	86	60	99	85	282	1492	1055	961	2771	2985
Total	2378	1960	4812	4672	7703	8577	6605	6603	15902	15778

Head of Development	Fifth Plan (1974-75 to 1977-78)		Annual Plans (1978-80)		Sixth Plan (1980-85)		Seventh Plan (1985-90)
	Approved Outlay(1)	Actual Expdt.	Approved Outlay	Actual Expenditure	Approved Outlay	Actual Expenditure*	Approved Outlay
	12	13	14	15	16	17	18
1. Agriculture & allied services & cooperation	4656	3441	3596	3524	12539	14638	22793
2. Water & power development(2)	10450	8200	7040	6710	38695	43467	71800
3. Industries and minerals	10201	7271	5486	4957	15018	16527	22461
4. Transport and communications	6885	5128	3941	3829	15546	17521	29443
5. Social & Community services	8209@	4172	3569	3481	14900	16736	31816
6. Economic & General Services & Miscellaneous		606	648	440	802	1061	1687
Total	40400	28819	24280	22941	97500	109950	180000

(1) For 1974-79; (2) Includes lumpsum allocation to REC for 1974-80
* Provisional @ Includes provision for item (6) also
Source:- (i) Statistical Abstract of India, 1982, CSO; (ii) Basic Stat. Relating to Indian Economy, 1985, CMIE; (iii) 7th Five Year Plan, NPC

Appendix II.2

Growth of NDP (1970-71 Prices)

(Per cent per annum)

	Target	Achievement	Gap
First Five Year Plan	2.3	3.4	(+)1.1
Second Five Year Plan	4.5	3.7	(-)0.8
Third Five Year Plan	6.0	3.6	(-)2.4
Fourth Five Year Plan	5.1	3.2	(-)1.9
Fifth Five Year Plan	5.0	3.9	(-)1.1
Sixth Five Year Plan	5.2	5.2*	..

*Anticipated Achievement. See 7th Plan, NPC

Appendix II.3

Investment as Proportion to NDP

(Per cent)

	Target	Actual
First Five Year Plan	6.9	7.3
Second Five Year Plan	10.7	11.0
Third Five Year Plan*	14.1	11.2
Fourth Five Year Plan*	14.2	13.7
Fifth Five Year Plan	16.3	21.0

*During these two Plan periods, the growth of NDP had fallen short of the targets by as much as 2.4 and 1.9 per cent.

Source:- For Appendix II.2 to II.11 - Capital and Technological Progress in the Indian Economy, 1950-51 to 1980-81 Birla Institute of Science.

Appendix II.4

Total Capital Stock (net) at 1970-71 Prices

(Rs. Crores)

Sector	1950-51	Percentage of total	1978-79	Percentage of total
1 Agriculture	8244	17 82	27226	17 12
2 Forestry	29	0 06	408	0.26
3 Fishing	71	0 15	896	0.56
4 Mining & Quarrying	219	0 47	2857	1.80
5 Manufacturing				
(a) Registered	4072	8.80	26557	16.70
(b) Unregistered	1380	2.98	8708	5.48
6 Construction	1126	2 43	3293	2.07
7 Electricity	886	1 87	11770	7.40
8. Railways	3625	7.83	9698	6.10
9. Other Transport	2379	5.14	7615	4.79
10. Communication	242	0.53	1632	1.03
11. Banking & Insurance	290	0.63	708	0.45
12. Real Estate	15661	33.85	27709	17.43
13. Trade, Hotel and Restaurant	5315	11 49	11712	7.32
14. Other Services	1721	3.72	4551	2.86
Total	46272	(100)	159001	(100)

Source:- Calculated from NAS Data, February 1982 and February 1983.

Appendix II.5

National Income, Capital Formation & Savings (at current prices)

(Rs. crores)

Year	GDP	NDP	GDCF	NDCF	NDS	3÷1	4÷2	5÷2
	1	2	3	4	5	6	7	8
1950-51	9177	8853	954	630	651	10.4	7.1	7.4
1951-52	9535	9176	1188	829	646	12.5	9.0	7.0
1952-53	9334	8945	772	383	417	8.3	4.3	4.7
1953-54	9993	9601	909	517	530	9.1	5.4	5.5
1954-55	9174	8745	1070	641	625	11.7	7.3	7.1
1955-56	9720	9272	1469	1021	982	15.1	11.0	10.6
1956-57	11199	10713	1959	1473	1113	17.5	13.7	10.4
1957-58	11247	10711	1843	1307	834	16.4	12.2	7.8
1958-59	12670	12043	1785	1158	782	14.1	9.6	6.5
1959-60	13120	12459	1996	1335	1104	15.2	10.7	8.9
1960-61	14071	13335	2544	1808	1327	18.1	13.6	10.0
1961-62	14897	14085	2438	1626	1281	16.4	11.5	9.1
1962-63	15835	14903	2916	1984	1544	18.4	13.3	10.4
1963-64	18090	17089	3266	2265	1825	18.1	13.3	10.7
1964-65	21260	20148	3735	2623	2023	17.6	13.0	10.0
1965-66	22030	20801	4390	3161	2562	19.9	15.2	12.3
1966-67	25480	24078	5437	4035	3112	21.3	16.8	12.9
1967-68	29870	28312	5334	3776	2939	17.9	13.3	10.4
1968-69	30548	28862	5113	3427	3011	16.7	11.9	10.4
1969-70	33792	31877	6295	4370	4129	18.6	13.7	13.0
1970-71	36736	34519	7177	4960	4566	19.5	14.4	13.2
1971-72	39262	36864	7976	5577	5099	20.3	15.1	13.8
1972-73	43241	40572	8066	5397	5100	13.7	13.3	12.6
1973-74	53772	50749	11784	8761	8369	21.9	17.3	16.5
1974-75	63263	59737	13306	9780	9127	21.0	16.4	15.3
1975-76	66370	62324	14729	10683	10800	22.2	17.1	17.3
1976-77	71808	67316	16390	11898	13207	22.8	17.7	19.6
1977-78	81179	76168	17770	12759	14224	21.9	16.8	18.7
1978-79	86910	81148	23925	18163	18035	27.5	22.4	22.2
1979-80	93983	87184	24294	17495	17034	25.8	20.1	19.5

Source:- National Accounts Statistics, CSO, Feb.1982 and Feb. 1983.

Appendix II 6

National Income, Capital Formation & Savings

(at Constant Prices) (Rs crores)

Year	GDP	NDP	GDCF	NDCF	3÷1	4÷2
	1	2	3	4	5	6
1950-51	17536	16798	2379	1641	13.6	9.8
1951-52	17883	17128	2804	2049	15.7	12.0
1952-53	18517	17733	1838	1054	9.9	5.9
1953-54	19688	18882	2127	1321	10.8	7.0
1954-55	20233	19371	2363	1501	11.7	7.7
1955-56	20870	19969	3323	2422	15.9	12.1
1956-57	22013	21071	4271	3329	19.4	15.8
1957-58	21631	20625	4088	3082	18.9	14.9
1958-59	23465	22381	3382	2298	14.4	10.3
1959-60	23894	22768	3741	2615	15.6	11.5
1960-61	25534	24360	4523	3349	17.7	13.7
1961-62	26440	25186	4140	2886	15.7	11.5
1962-63	27003	25583	4808	3388	17.8	13.2
1963-64	28380	26916	5080	3616	17.9	13.4
1964-65	30617	29026	5581	3990	18.2	13.7
1965-66	29023	27335	6170	4482	21.3	16.4
1966-67	29307	27524	6675	4892	22.8	17.8
1967-68	31868	29993	6139	4264	19.3	14.2
1968-69	32725	30778	5758	3811	17.6	12.4
1969-70	34801	32692	6677	4567	19.2	14.0
1970-71	36736	34519	7177	4960	19.5	14.4
1971-72	37313	35028	7547	5262	20.2	15.0
1972-73	36910	34502	7075	4667	19.2	13.5
1973-74	38646	36203	9072	6629	23.5	18.3
1974-75	38979	36624	8205	5850	21.0	16.0
1975-76	42662	46155	8422	5915	19.7	14.7
1976-77	43208	40565	9134	6491	21.1	16.0
1977-78	46948	44156	9668	6876	20.1	15.6
1978-79	49403	46366	12108	9071	24.5	19.6
1979-80	46948	43804	10584	7440	22.5	17.0

Appendix II 7

Growth of NDP & Capital Investment

(at 1970-71 Prices) (Rs crores)

Year	N D P	Index (1950-51=100)	N D C F	Total Capital	Index (1950-51=100	Year to year growth (%) NDP	Year to year growth (%) Capital
1950-51	16798	(100 0)	1641	44223	(100 0)	----	---
1951-52	17128	(101 9)	2049	46272	(104 5)	1 9	4 5
1952-53	17733	(105.7)	1054	47326	(106 8)	3 7	2 2
1953-54	18882	(112.5)	1321	48647	(109 9)	6 4	2 9
1954-55	19371	(113 9)	1501	50148	(112 9)	1 2	2 7
1955-56	19969	(118 8)	2422	52570	(118 2)	3	4 7
1956-57	21071	(125 2)	3329	55899	(125 5)	5 3	6 2
1957-58	20625	(122.6)	3082	58981	(132 2)	-2 1	5 3
1958-59	22381	(133.3)	2298	61279	(137 2)	8 7	3 8
1959-60	22768	(135.7)	2615	63894	(142 9)	1 8	4 2
1960-61	24960	(144.0)	3349	62243	(150 2)	6 1	5 1
1961-62	25186	(148.8)	2886	70129	(156 5)	3 3	4 2
1962-63	25583	(151 5)	3388	73517	(163 9)	1 8	4 7
1963-64	26916	(159.7)	3616	77133	(171 8)	5.4	4 8
1964-65	29026	(172.6)	3990	81123	(180.5)	8 1	5 1
1965-66	27335	(163 1)	4482	85605	(190.2)	-5.5	5.4
1966-67	27524	(163.5)	4892	90497	(200.9)	0.2	5 6
1967-68	29963	(178.4)	4264	94761	(210.2)	9.1	4.6
1968-69	30778	(183.1)	3811	98572	(218.5)	2.6	3 9
1969-70	32692	(194.4)	4567	103139	(228.5)	6.2	4 6
1970-71	34519	(204.6)	4960	108099	(239.3)	5.2	4.7
1971-72	35028	(207 5)	5262	113361	(250.7)	1 4	4.8
1972-73	34502	(204.8)	4667	118028	(260.9)	-1.3	4.1
1973-74	36203	(214.6)	6629	124657	(275.4)	4.8	5.6
1974-75	36624	(217.1)	5855	130512	(288.1)	1.1	4.6
1975-76	40155	(238.0)	5915	136427	(301.0)	9.6	4.5
1976-77	40565	(240.4)	6627	143054	(315.5)	1.0	4.8
1977-78	44156	(261.7)	6876	149930	(330.5)	8.9	4.8
1978-79	46366	(274.8)	9071	159001	(350.3)	5.0	6.0
1979-80	43804	(259.6)	7440	166441	(366.5)	-5.6	4.6
1980-81	47193	(280.9)	8766	175207	(396.2)	8.2	8.1

Appendix II.8

Source of Growth in Different Countries

Country	Period	Growth	Rate growth of factor inputs			Rate of growth due to residual factors
			Capital	Labour	Total	
1	2	3	4*	5*	6	7
1. U.S.A.	1950-62	3.32	0.83	1.12	1.95	1.37
2. Canada	1950-57	4.95	1.14	1.85	2.99	1.96
3. Japan	1953-71	8.81	2.10	1.85	3.95	4.86
4. Belgium	1950-62	3.20	0.41	0.76	1.17	2.03
5. Denmark	1950-62	3.51	0.96	0.59	1.55	1.96
6. France	1950-62	4.92	0.79	0.45	1.24	3.68
7. Germany	1950-62	7.26	1.41	1.37	2.78	4.48
8. Netherlands	1950-62	4.73	1.04	0.87	1.91	2.82
9. Norway	1950-62	3.45	0.89	0.15	1.04	2.41
10. U.K.	1900-62	2.29	0.51	0.60	1.11	1.18
11. Italy	1900-62	5.96	0.70	0.96	1.66	4.30

Note:- Col. (6) = Col. (4) + Col. (5);
Col.(7)=Col.(3) - Col.(6)

*Col.(4) and Col. (5) are rates of growth of capital and labour multiplied by their respective shares in the NDP.

Contribution to Growth by Capital, Labour and Technology (per cent)

Country	Capital	Labour	Technology	3+4
	1	2	3	4
1. U.S.A.	25.0	33.7	41.3	1.65
2. Canada	23.0	37.4	39.6	1.72
3. Japan	24.0	21.0	55.2	2.30
4. Belgium	13.0	23.8	63.4	4.88
5. Denmark	27.0	16.8	55.8	2.07
6. France	16.0	9.1	74.8	4.68
7. Germany	19.0	18.9	61.7	3.25
8. Netherlands	22.0	18.4	59.6	2.71
9. Norway	26.0	4.4	69.9	2.69
10. U.K.	22.0	26.2	51.5	2.34
11. Italy	12.0	16.1	72.1	6.03

Compiled from Appendix II.8
Col.(1) of this table is Col.(4) divided by Col.(3) of that table.
Col.(2) of this table is Col.(5) divided by Col.(3) of that table
Col.(3) of this table is Col.(6) divided by Col.(3) of that table

Appendix II.10

Growth of Factor Inputs in the Indian Economy

Factor input	Index (1950-51=100)	Total Factor Input I	Total Factor Input II
Capital	416	116.77	80.2
Labour	155	92.63	115.6
Land	133	12.75	8.1
Total Factor Input		226.15	204.83
N D P	282.77	282.77	282.77

I is obtained by using the estimates of factor shares of Rao, and

II is obtained by using the factor share estimates of Brahmananda.

Appendix II.11

Relative Contribution of Growth of NDP

	Estimate I	Estimate II
Capital	39.3	27.1
Labour	26.8	32.1
Land	2.8	1.9
Technology	31.1	39.1
Total	100.0	100.0

Appendix II.12

External and Internal Debt of India

(Rs. crores)

Year	External Debt	Internal Debt
1	2	3
1970-71	747.9	234.3
1971-72	783.6	398.0
1972-73	654.2	566.3
1973-74	1015.0	637.6
1974-75	1220.4	705.7
1975-76	1557.2	727.3
1976-77	1353.1	1023.3
1977-78	1029.4	1369.5
1978-79	942.3	1838.6
1979-80	1048.6	2148.4
1980-81	1765.3	2804.5
1981-82	1537.8	3237.8
1982-83	1910.4	4198.9
1983-84	1964.2	4588.8
1984-85	1963.3	4872.5

Col.(2) = Loans utilised for the respective years. Source:- Economic Survey, 1985-86,GOI.

Col.(3) = Net Market Borrowings of the GOI and State Governments. Market Borrowings accepted minus amount repayable in cash in respect of maturity loans. Source:- Report on Currency and Finance, Vol.II, Various Issues, RBI.

Appendix II.13

Production of Basic Goods in a Few Capitalist Economies, Socialist Economies and India 1956 & 1982

Countries	Crude Steel (Million Tonnes)		Crude Petroleum (Million Tonnes)	
	1956	1982	1956	1982*
1	2	3	4	5
i				
1 United Kingdom	20.99	13.71	1.46	150.70
2. France	13.40	18.40	1.26	2.40
3 Germany (FRG)	23.19	35.88	3.51	6.19
4. U.S.A.	104.52	109.61@	353.70	618.81
5. Japan	11.11	101.68@	0.31	0.58
6. Canada	4.81	11.87	23.26	90.39
ii				
7. USSR	48.70	147.17	83.81	890.72
8. China	4.47	37.16	1.16	148.48
9. GDR (East Germany)	3.11	7.17	NR	0.08
iii				
10. India	1.77	10.92	0.40	28.69

*Crude Petroleum for 1982 in coal equivalents.
@Figures relate to 1981.

Source:- Statistical Year Book, U.N., New York, 1965, 1978 & 1982. Economic Profiles of 40 Major Countries, CMIE, Bombay 1984 to 1986.

Countries	Coal (Million Tonnes)		Electricity (Billion Kwh)	
	1956	1982	1956	1982
1	6	7	8	9
i				
1. United Kingdom	225.57	124.7	101 2	272 1
2. France	55.13	17.1	53.8	260.7
3. Germany(FRG)	135.62	85.0£	87.8	366.9
4. USA	477.99	756.1	684.8	2314.0
5. Japan	46.56	17.0£	73.4	522.5
6. Canada	11.41	499.8$	88.4	376 5
ii				
7. USSR	304.00	488.0	191.7	1325.0@
8. China	110.36	651.0	16.6	309.3@
9. GDR(East Germany)	2.74	0.05¥	31.2	100.7@
iii				
10. India	39.91	128.2	12.0	131.5

£ Figures relate to 1983;
$Figures relate to 1977
¥Figures relate to 1979

Countries	Cement (Million Tonnes)		Nitrogenous Fertilizer (Million Tonnes)		Foodgrains§ (Million Tonnes)	
	1956	1982	1957-58	1981-82	1956	1982
1	10	11	12	13	14	15
i						
1. United Kingdom	12.97	12.97	0.35	1.27	2.92	10.26±
2. France	11.39	26.14	0.51	1.59	6.15	25.37
3. Germany (FRG)	19.21	30.08	1.05	1.11	7.24	8.63±
4. USA	56.15	58.37	2.14	10.51	27.90	83.44
5. Japan	13.02	80.69	0.88	1.03	16.17	13.58
6. Canada	4.64	8.14	2.20	1.75	15.81	27.62±
ii						
7. USSR	24.86	123.68	0.63	1.06	81.72	89.50
8. China	6.39	95.20	NR	10.11	107.25	214.11
9. GDR (East Germany	3.27	11.72	0.31	0.97	3.39	2.94±
iii						
10. India	5.01	22.65	0.08	3.14	52.32	105.83

§Wheat and Rice
±Production of wheat alone.