The Core Committee

(Composition as in 2002)

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Shri S.C. Das Commissioner (P&D), Government of Assam	Member
Prof Kirit S. Parikh Indira Gandhi Institute of Development Research	Member
Dr. Rajan Katoch Adviser (SP-NE), Planning Commission	Member-Convener

Ms. Somi Tandon for the Planning Commission and Shri H.S. Das & Dr. Surojit Mitra from the Government of Assam served as members of the Core Committee for various periods during 2000-2002.

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The background work for different themes were mainly done by different members of the team as follows: Strategy for Assam's Development – Kirit Parikh; Prospects for Economic Growth – Manoj Panda; Reorienting Fiscal Strategies – Shikha Jha; Poverty, Health and Education – P.V. Srinivasan; Infrastructure – Kirit Parikh; Industries – Atul Sarma; Transport on the Brahmaputra – Sanjoy Hazarika and Biswajeet Saikia; Agriculture: Constraints and Policy Options – A. Ganesh Kumar; Shallow Tubewell survey – B. Sarmah; Pisciculture and Forestry – Kalyan Das; and Tourism – Abu Nasar Saied Ahmed.

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INTRODUCTION

1. The Assam Development Report, prepared by the Union Planning Commission and Government of Assam with the assistance of the Indira Gandhi Institute of Development Research (IGIDR), Mumbai, is one of the seminal State Development Reports being prepared by the Planning Commission, thanks to the in-itiative taken by our Hon'ble Deputy Chairman Shri K. C. Pant.

2. We have initiated under his direction and in coordination with the States concerned, preparation.of State Development Reports (SDR) for thirteen States so far. Over the Tenth Plan period, this exercise will be expanded to include most of the States in the country. The salient aim of these Reports is to provide a quality reference document on the development profile and strategies for accelerating the growth rate of the States. These SDRs are to act as major inputs in Development.

3. This exercise is particularly relevant in the case of Assam, since in the period 1993-94 to 1999-2000, when the all India rate of growth of Gross Domestic Product (GDP) was around 6.68%, the growth of the State Domestic Product (SDP) of Assam was only 2.49%. In the Tenth Plan we are aiming to achieve a national growth target of 8% per annum, and this would require achieving a growth rate of over 6 per cent per annum even in less developed States like Assam. The Assam Development Report hopes to catalyse policy action towards the desired growth strategy that will enable Assam to achieve the growth rates of over 6% per annum, that are now being targeted for the State for the Tenth Plan and beyond.

4. Assam is a very important border State and a developed Assam will be a great asset to the Nation as a whole. I trust that the report will also be a useful working document, which will impart value for development practitioners interested in the State. I commend this report to the people of Assam, and look forward to it setting out a road map for accelerated growth and intensified poverty reduction for the State in the future.

5. I would like to place on record my deep sense of appreciation of the significant work of Prof. Kirit Parikh, Chairman, IGIDR, Mumbai and Dr. Rajan S. Katoch, IAS, Adviser (SP-NE) of the Planning Commission in addition to officers of the Assam Government.

New Delhi Date
20.08.2002

(K. Venkatasubramanian)

Chiei Minister, Assam
Guwahati

Tarun Gogoi

Assam Development Report

Foreword

Contrary to what was envisioned in our constitution, the five decades of planning could not reduce the regional disparity in our country; in fact, in many spheres the gap has widened further. The rate of economic growth in a vast majority of areas is abysmally poor and Assam is not a case in exception in this trend. Therefore, it is high time we looked back at the strategies of development adopted during the last five decades and make an in depth analysis of the net results thus arrived at. It is clear that, for the country to prosper as a single entity, there has to be all round uniform development across the length and breadth of the country and for that purpose the areas of low growth syndrome needs special attention from the top policy makers.

The Assam Development Report prepared by the Planning Commission along with the Government of Assam and Indira Gandhi Institute of Development Research suggests a framework for the development of Assam. It also makes a number of policy recommendations for accelerating the pace of development in Assam. We will strive to take all the measures that are within our means to accelerate the process of development in the state, however difficult it might be. At the same time, we do urge for the required attention and help from the Central Government, in a proactive manner, particularly for issues where it alone can act.

The present Government in Assam is committed to ensure that the standard of living of the people in the state continues to improve. I hope that the present report will help all of us to come to grips with today's realities and help make quick rational development decisions. I look forward to the Assam Development Report becoming a valuable input in focusing attention to key development issues by all concerned.

(Tarun Gogoi)
Chief Minister, Assam

Date : 14.8.2002

Schematic Map of Assam

(Showing major Cities, Rivers, Neighbouring States and Countries)

CHINA

Arunachal Pradesh

NEPAL

M

North Lakhimpur

Dibrugar

A

Sibsagar

Sikkim

Bhutan

Brahmaputra River

Tezpur

Jorhat

Bihar

Barpeta

Nalbari

S

Nagoan

Golghat

A

S

Dhuburi

Guwahati

Dispur

Nagaland

Diphu

MYANMAR (BURMA)

Meghalaya

Haflong

Manipur

Karimganj

Silchar

BANGLADESH

Tripura

Mizoram

West Bengal

Calcutta

Bay of Bengal

N

W

E

S

Map: Not to Scale

Executive Summary

State of Assam's Development – The Point of Departure

1. The most striking fact of Assam's economic development is that it is falling behind the rest of the country. In 1950-51, per capita income in Assam was 4 per cent above national average. In 1998-99 it was 41 per cent below the national average at current prices and 45 per cent below the national average at 1980-81 prices. What is even more alarming is that the gap is growing. Between 1980 and 1990, per capita income at 1980-81 prices grew by 20 per cent in Assam compared with 40 per cent for all-India. Between 1980 and 1998, per capita income in Assam grew by 10 per cent compared with 39 per cent for all India.
2. During 1951-79, Assam's economy grew at more or less the same rate as the rest of India. Yet, Assam's per capita income fell due to higher rate of population growth in Assam due to immigration. Over the period Assam's population grew at an average rate of around 4 per cent per year. The widening disparity since 1980-81 is, however, due to slower growth of its economy. While the Indian economy grew at 6 per cent over 1981 to 2000, Assam State GDP grew only at 3.3 per cent. And though the growth rate of the Indian economy accelerated in the 1990s over 1980s, Assam's economy decelerated in the 1990s. The poor growth performance is in all sectors. Agriculture has grown only at 2.1 per cent per year over the 1980s and 1990s and has slowed down in the 1990s to 1.6 per cent. Manufacturing growth rate in the 1990s was higher at 3.4 per cent compared to 2.4 per cent in the 1980s, while services growth has decreased marginally from 4.9 per cent to 4.5 per cent.
3. The poor growth meant fewer new jobs with rising educated unemployment. Governments in the past have followed the easy way out to increase government and public sector employment. Thus labour-employing activities under public sector like electricity and water supply grew rapidly in the 1980s. The situation today is such that 90 per cent of Assam's tax and non-tax revenue inclusive of its share in central taxes and non-plan grants in 1997-98 went for maintaining the government servant, past and present, that is, for wages, salaries and pensions (NIPFP (1998), State Fiscal Studies: Assam P.40). Very little is left to do what the government is supposed to exist for.
4. It is not that Assam has made compensatory progress in other indicators of human welfare. Its progress in education and health is just about average for the country. In alleviation of poverty too compared to India, it has higher rural poverty and the decline has been much smaller in Assam. Rural poverty shows a decline only in recent years. Assam is the only

major state in India that showed increasing rural poverty over a long period from 1957 to 1994, even though inequality as reflected in Gini coefficient, of consumption expenditure was falling. Urban poverty level has been lower in Assam. However, urban population constitutes only 11 per cent of the total population in Assam compared to 25.7 per cent in the country as per the 1991 census.

Reasons for Poor Growth

5. Floods have been exogenous source of handicap to the development of Assam. Floods in the Brahmaputra and Barak valleys of Assam cause "serious erosion, loss of life and livestock and heavy damage to infrastructure and property retarding agricultural productivity on account of risk avoidance and sandcasting, disrupting communications and education and posing health hazards. The floods damage to crops, cattle, houses and utilities in Assam alone between 1953 and 1995 is estimated at Rs 4400 crore with a peak of Rs 664 crore in a single bad year." Floods have impeded the technological transformation of agriculture in Assam. For, farmers do not apply costly inputs such as fertilizers and HYV seeds for the fear of their being washed away by floods. 92.6 per cent of the cultivated land is flood prone.
6. Apart from floods, inadequate attention to agriculture has also been responsible for slow agricultural development. Thus, poor agricultural development is due to partly neglect of agriculture and partly the difficulty of increasing productivity with a high probability of floods that may wash away costly inputs. Its consequences on an economy with 89 per cent rural population are overwhelming. This is reflected in a much higher level of the people below the poverty line in 1999-2000.
7. Industrial growth in Assam and North-East has been very poor Within the region they have lacked good infrastructure and for want of adequate markets the local market does not provide enough demand. Outside the region, they have not been able to compete because of the high transport cost.
8. The partition of the country imposed on Assam and the North-East a huge transport and access disadvantage. This transport disadvantage discourages industry from locating in Assam. Only those industries which are based on special raw materials available in the North-East are likely to locate here. To move a nine-ton truck from Guwahati to Kolkata a distance of 1100 kms today costs around Rs 20,000. A truck going from Chennai to Kolkata, a distance of 1600 kms, costs only Rs 16,000. This also reflects on the quality of road connecting the North-East with the rest of the country. In the pre-partition days, boats laden with tea, coal and timber reached Kolkata from Dibrugarh in eight days. But now Kolkata – Guwahati takes more than 25 days due customs formalities at various points. The transport

cost has increased. The net effect has been that people pay higher prices for goods imported from the rest of the country and Assam's producers do not get right prices for their products.

9. Of course, one could have developed industries to supply the North-East market itself. The high transport cost would have provided some protection. This did not take place. This suffered from lack of infrastructure within the North-East in the early decades after Independence. This led to a much slower growth of industries and incomes in North-East and Assam than in the rest of the country. Once industrial growth stagnated so did income growth and the growth of demand for manufactured goods slowed down in turn. Thus even industries to serve North-East demand did not grow. A vicious circle developed.

10. Successive governments in recent years have offered many concessions to industries in the North-East. These reduce their tax burden to compensate them for the transport disadvantage to attract them to locate in the region. The New Industrial Policy for the North-East offers very attractive incentives. However, as long as the taxes that the government waives are collected by others, these incentives would not be effective. If the problem of governance can be solved, Assam should now be an attractive place for many industries.

Strategy for Development

11. Assam's economy has to accelerate and catch up with the rest of the country. Assam has come to a state where this seems possible. Infrastructure is in a better shape in terms of roads and railways. Civil aviation can be quickly improved. Power situation can be made better soon if projects under implementation are quickly completed. Telecommunication is growing rapidly and the new technology makes it possible to get connected from any place at modest cost without waiting for government to invest in capacity creation and network expansion. Finance is now relatively easier to obtain. The implementation of the package announced by Prime Minister Atal Behari Vajpayee will give a big thrust to the region's economy. The continuous monitoring of the various measures in a transparent manner where the progress report can be tracked on a website updated every three months, offers hope that these measures will be implemented. Thus the stage is set for Assam to take off.

12. Government has an important role to play in the development of Assam, in the provision of social services, infrastructure and good governance. To do this it will have to put its fiscal house in order. Downsizing of government is the most pressing imperative for faster development. It is critical to develop institutional mechanism particularly to provide accountability and to shake up non-performing governance systems. Decentralization and devolution of financial resources to local Panchayats should be done as soon as possible. People should be given a right to information, so that local bodies function in a transparent manner. A strategy of development led by public action and initiatives all over the state is more likely to succeed, where young men and women clearly perceive the promise that the

future holds out for them. Such decentralized development is less likely to be a victim of extortions.

13. If Assam's development is to be based on its natural resources and on a participatory basis, the following sectors will play important roles:

    - Agriculture
    - Horticulture and Agro Processing
    - Silviculture and Handicrafts
    - Fishery
    - Forestry and related industries
    - Tourism
    - Petrochemicals and related industries
    - IT based services

    These are obvious and well known. We have tried to explore: what has constrained development of these sectors? What should we do now that is different and would lead to better results? These are critical questions.

Growth Prospects: A Macro View

14. Assam's economic development has been falling behind the rest of the country with the gap widening at an alarming rate. While India's economic growth picked up after the initiation of economic reforms in early 1990s to about 6 per cent, Assam missed this opportunity again. All evidences point towards long run stagnancy in growth rate in gross state domestic product at around 3.5 per cent per annum. This stagnancy of Assam is a worrisome feature not only for the state but also for the nation's overall development process. While overall growth rate is slow, Assam has more egalitarian distribution compared to other states. Despite this, Assam is the only state where poverty did not show a declining trend over a long period. Higher growth then becomes a necessary condition for poverty alleviation in a situation where scope for inequality reduction is limited. Quicker economic progress would also help to control insurgency since economic scarcity generates more social tension and fuels insurgency.

15. To eliminate the current disparity between the state and the nation's average level of living would require Assam to adopt a growth strategy to raise its per capita income to the national average by 2025. This would require:

    - A pick-up in state income growth to the national level in the medium run of about 5 years.

- A 2-3 percentage points higher growth rate than the national level there after for about two decades.

The above steps would arrest further widening of current disparity in average level of living between Assam and all-India during next 5 years and then gradually reduce the disparity over a period of 20 years. The current shortfall has been built up over more than 40 years and it would not be possible to remove it within a decade or so.

16. Admittedly, it is not an easy task. Yet, it is not an impossible task. Assam has got the required natural and human resources. Generation of required financial resources would involve the following:

    - Steady pick-up in investment rate in relation to state income.

    - Attraction of private investment in a big way. This in turn requires quick solution of the insurgency problem.

    - Maintenance of the important role of the public sector in areas such as irrigation, infrastructure and social sectors where private investment might not come forward.

    - Priority should be given to those sectors, which have both comparative advantage and high linkages with other sectors. Among them are sectors such as agriculture, fishery, wood products, textiles, petroleum, fertilizers, edible oil, paper and paper products, and information technology.

17. The task would call for synchronized efforts by various agencies in state and central governments, private entrepreneurs, international financial agencies and non-government organizations. In the era of liberalization and globalization, the key words are 'competition' and 'efficiency'. Assam must improve efficiency by concentrating on sectors which have comparative advantage to withstand global competition. Assam's development has to be based on its natural resources and on a participatory basis. The sectors that offer much scope for development include agriculture, horticulture and agro processing, silviculture and handicrafts, fishery, forestry and related industries, tourism, petrochemicals and related industries and IT based services.

Fiscal Management

18. The government of Assam needs to initiate fiscal, governance and public enterprise reforms to restore fiscal sustainability, improve governance and accelerate economic growth. It needs to reorient spending priorities towards capital expenditure, in particular, rural infrastructure-irrigation, roads and electricity. Apart from making new government employment on contractual basis, while downsizing its regular staff strength, the government also needs to rationalize subsidies and restrict guarantees to viable projects with good credit rating. Moreover, to improve tax collection it needs to strengthen administrative machinery at state

and local level. The central government can provide initial counterpart funds for reform, with monitoring and evaluation. It can also provide special phased grant to repay part of state liabilities and link transfer of funds to fiscal performance.

19. An Action Plan would therefore be

- Reorient spending priorities
  - Capital expenditure – rural infrastructure (irrigation roads and electricity)
  - Safety-nets based employment programmes targeted at rural areas and uneducated youth
  - Any new government employment on contractual basis along with downsizing of regular staff
  - Staff transfer from state to rural and urban locations
  - Rationalization of subsidies
  - Restriction of guarantees to viable projects with good credit rating
- Improve tax revenue generation
  - Strengthen administrative machinery for tax collection at state and local level
  - Impart technical training with help from the centre
  - Focus on high-yielding/ buoyant taxes
  - Levy taxes on *ad-valorem* basis (on value, not quantity)
  - Introduce price differentiation
  - Cut out exemptions
- Improve non-tax revenue generation
  - Increase user charges appropriately at state and local level
  - Improve efficiency of operation of public enterprises
  - Privatize enterprises in sectors not very relevant for the government
- Impose limit on total borrowings/ debt accumulation
- Make fiscal operations transparent to the public
  - Full disclosure of policy intentions
  - Report on receipts/ expenditure and contingent liabilities
- Establish well-functioning local governments in urban and rural areas with
  - Adequate powers, functions and resources
  - Fiscal autonomy to decide upon, collect and spend their revenues
  - Planning and implementation of development programmes
- Central government to provide
  - Initial counterpart funds for reform, with monitoring and evaluation
  - Special phased grant to repay part of state liabilities
  - Transfer of funds linked to fiscal performance

Poverty, Education and Health

20. Development is incomplete without social development. The poor performance in terms of rural poverty is mainly due to the low productivity of non-skilled agricultural labor and low real wages. Assam ranks 12th among 16 states in terms of human and gender development indices. Poor indicators are not as much due to expenditure shortfall as they are due to inefficient expenditure management. Public expenditure on health and education as a percentage of SDP is higher than the average for all states and increasing. Per capita expenditure on education is higher than the average for all states and increasing. Large percentage of expenditure is however, unproductive, going to wages and salaries. Gap between plan outlay and utilization exists possibly due to the inability in mobilizing resources to meet the matching fund requirements for centrally sponsored programmes. There is a need to recover costs of providing public services to the maximum extent possible, reduce establishment costs and administrative overheads and transfer expenditure authority to local bodies who are directly responsible and accountable to the local people.

21. Provision of better education and health facilities is necessary to strengthen the capabilities of the poor and vulnerable groups to earn income. Resource constraints make it imperative that poorer geographic regions need to targeted first so that resources are not thinly spread and the quantum of subsidy is large enough to pull the poor out of poverty on a sustained basis. Resource constraints need to overcome through innovative means, e.g., use of health cards (similar to ration cards) to protect the poor and introduction of user charges for certain health services. Universal elementary education can be achieved by providing special incentives such as mid-day meals and special subsidies, for example to girl children to close gender gaps in education. Innovative measures can be used such as the Education Guarantee Scheme of the Madhya Pradesh government to reduce the costs of schooling and increase the accountability of teachers.

22. The broad areas of action to be followed are

    - Provision of better education and health facilities to strengthen the capabilities of the poor and vulnerable groups to earn income.
    - Focus on asset formation through employment generation programmes in order to achieve sustainable poverty reduction.
    - Use of tools of geographic targeting to target the poor so that resources are not thinly spread and the quantum of subsidy is large enough to pull poor out of poverty on a permanent basis.
    - Provision of better irrigation facilities and water management in order to encourage the self-employed in agriculture to diversify their activities and increase their incomes.

- Development of opportunities for non-farm employment by strengthening rural marketing infrastructure and deregulation of markets (removal of small-scale sector reservations and restrictions under the Essential Commodities Act).
- Encouraging local community participation in decision making by strengthening the decentralization process through Panchayati Raj institutions.
- Use of modern technology to overcome some of the existing infrastructural bottlenecks (e.g. cellular phones).
- Improving the social status of women through better access to education apart from improving health care services.
- Overcoming resource constraints by introducing user charges for certain health services. Enhancing household's ability to pay through risk sharing mechanisms such as insurance and other forms of social financing including employer health-based insurance schemes. Use of health cards (similar to ration cards) to protect the poor.
- Achieving universal elementary education by giving special attention to remove various kinds of disparities- caste, gender and regional. Provide special subsidies, for example to girl children to close gender gaps in education.
- Removing the administrative burden of mid-day meal scheme on the educational system by providing free of cost additional foodgrain quota for school going children, through the regular public distribution system.
- Use of innovative measures such as the Education Guarantee Scheme of the Madhya Pradesh government to reduce the costs of schooling and increase the accountability of teachers.
- Exploit the potential for cost recovery in higher education.

Infrastructure and Industries

23. The Partition of the country imposed on Assam and the North-East a huge transport and access disadvantage. The development of infrastructure, roads, railways, power and telecommunications in Assam has not kept pace with those in the rest of the country. The following are some areas of action in the transportation sector.
    - Maintenance of existing roads needs to be improved as many roads are in poor state and all weather connectivity for many villages is limited
    - Congestion on the Siliguri-Guwahati sections of the railway should be relieved either by double tracking or providing adequate bypass siding.
    - Army and the railways testing and certification facilities should be set up in Guwahati,

- Bridges across Brahmaputra are extremely important for connectivity and there are only three bridges today.
- Air connectivity is vital for a modern economy. To develop tourism, it is a must. Fuel price and tax concession are offered to encourage internal air services within the North-East should be continued.
- Convenient same day return flights to Kolkata are needed.
- The inland water transport network was disturbed by partition and further disrupted by the earthquake of 1950. Its revival needs a coordinated effort to provide infrastructure support and night facilities.

24. Per capita electricity consumption in Assam is only one fourth of the all-India consumption reflecting the poor quality of life and low-level of economic activity. If all the projects, which were under implementation in March 1996, were to be completed, the NE would have a total installed generating capacity of 3396 MW, enough to meet its demand for some years. The work on these projects proceed at a slow pace due to lack of funds. The gap between the average cost of supply and the average tariff is a phenomenal figure of Rs 4.50 per unit. Power sector reforms have become critical to improve the financial position of ASEB and should be steadfastly pursued. Apart from pressing for more funds for large hydel projects conceived years ago a fresh look at them should be taken for alternative designs taking into account their social and environmental consequences.
25. A world-class telecom service offers an opportunity to Assam to overcome its traditional access disadvantage. Government policy must facilitate development of telecommunications in the North-East which has difficult terrain and many remote villages. Availability of credit is critical for development of small enterprises. The credit disbursed by banks and financial institutions needs to be stepped up.
26. Development of infrastructure can make the North-East market accessible to industries and stimulate industrial growth.
27. The army and the railways demand significant goods in the North-East. Some industries could have been developed to meet these demands. Unfortunately, products have to be tested and certified for their quality. This, however, is done in Kolkata. A supplier may have to make few trips to Kolkata the cost of which small entrepreneurs could ill afford. Of course, if testing and certification facilities are set up on Guwahati, this disadvantage could be overcome.
28. Yet Assam and North-Eastern States' development can get a big boost if trade with neighbouring countries -- Bangladesh, Myanmar and China -- can be made freer. The Ministry of External Affairs can do more for the North-East than perhaps what Planning Commission can do.

29. Along with the development of modern industries, the scope to develop handicrafts and traditional industries should not be forgotten. Assam's handicrafts need to be marketed to obtain high prices for them. This requires modern design and a marketing set up that targets high-income consumers in the world. A system to encourage private designers and entrepreneurs needs to be evolved. Assam's unique Muga silk has not seen any technological development as hardly any research effort has gone into it. A silviculture research institute should be set up in Assam.

30. The Central Government should continue to provide special concessions to Assam's industries. Unless extortion by various insurgent groups is brought under control, industrial growth is unlikely to accelerate despite many tax concessions and very attractive incentives to industries. We need to understand better how militancy and insurgency can be contained. This however needs a separate study.

Inland Water Transport

31. While flooding no doubt has its negative consequences the river Brahmaputra can be used to promote economic growth. Development of river communication in Brahmaputra will be a turning point for the sustainable economic development of the region. Integrating with other modes of transportation, Inland Water Transport (IWT) can play a vital role in infrastructure building in an under developed state like Assam. The use of waterways will generate employment, both directly and indirectly. Trade and other economic activities will enhance the economy of the region signiflcantly, especially if incentives are provided for investment in water transport. The infrastructure of inland water transport can help mitigate the impact of floods. A detailed cost beneflt analysis of opportunities for defense, communications and transport and tourism on the entire length of the Brahmaputra would bring out the true potential of investment in water transport.

32. The importance of inland water transport has been highlighted by the disastrous flood situation in Assam. In 2002, not less than one-fifth of Assam's population is crippled by devastating floods -- about five million have been displaced from their homes with property and livestock damage. The number of relief boats, including the private vessels requisitioned by the district administration, are inadequate to meet the emergency and the outbreak of diseases are likely. Decades of building bunds and embankments have only aggravated the problem of flooding, trapping millions as the embankments gave way to the surging river tides.

33. Successive governments have failed to encourage inland water transport as well as construction of large number of vessels -- medium and small size especially -- which can play a crucial role in evacuating the marooned and reaching relief supplies to the needy at

times of floods. Year after year, the same tragic scene is replayed but no long-term solutions are thought of except of bunding the river. It would be far more practical to encourage an investment in boat-building that would ensure that every village prone to floods and displacement has at least two well equipped boats to move people to higher ground and also get relief supplies to them. This should be undertaken on an emergency, mass footing. It can generate employment and develop a strong base for inland water transport. Roads and railways cannot reach millions of people at times of flood -- the river, used as an ally, has help those in distress from its power.

34. The Government must ban further construction of embankments by unthinking engineers, supported by politicians and officials, who do not understand the hydrology of the river. It should also include social scientists, environmentalists and geographers in developing strategies to deal with the situation. Otherwise both flood relief and funds meant for "embankments" are likely to go only to the corrupt and well-connected, and death and devastation in the Assam Valley will continue.

35. A lot of manpower time, energy and opportunities for employment generation are lost during the months of high water. Virtually every other sector of Assam's economy, whether it is agriculture, flsheries or tourism is connected to the Brahmaputra and its tributaries. It is thus important to give high priority to development of inland water transport.

36. The following needs to be done:

- Set up a Brahmaputra Development Authority with appropriate local ownership.
- Encourage modernization and acquisition of vessels and crafts.
- Set up basic on shore facilities and strengthen inter-nodal transport with road and rail.
- Provide fiscal incentives for private developers.
- Dredging capacity needs strengthening.
- Develop inland water transport for bulk goods traffic by providing inter-nodal connectivity and developing Farakka as a major inland port.

Strategies for Agricultural Growth

37. Agricultural growth can be stepped up by taking measures to improve cropping intensity. Since crop cultivation in the kharif season is faced with natural risks such as floods the use of HYV seeds and chemical fertilizers and pesticides has been low, resulting in lower yields. Therefore rabi season cultivation needs to be promoted with a continued emphasis on irrigation through shallow tube wells. Taking into account the transport bottleneck and the perishability of the primary produce in the short-run greater emphasis needs to be given to food processing industries. Cultivation of vegetables, fruits, and spices and commercialization of agriculture needs to be encouraged by investing in marketing and

storage facilities. Institutional reforms are needed to ensure equitable distribution of benefits from the rich ground water resources of Assam. Effective participation of the poor farmers can be ensured through revitalizing the local bodies such as the Panchayats. Poor farmers also need to be provided adequate training and extension services.

38. Assam can produce enough agricultural surplus through appropriate technological intervention designed for increasing cropping intensity from its present level of about 146 per cent to at least 200 per cent, and evolving a cropping pattern consistent with its agro-climatic factors. A large part of the state gets severely affected by floods every year, nevertheless, as the technical experts have shown, at least 200 per cent of cropping intensity can be achieved even in the fiood prone areas. This, however, requires assured irrigation. Assam is enormously rich in ground water resource on the basis of which, another 47 per cent of the net sown area of the state can be brought under assured irrigation.

39. An action plan would therefore consist of

- Promote rabi season as engine for agricultural growth.
- Aggressively push for commercialization of agriculture.
  - Promote rice, tea, vegetables, fruits, and spices.
  - Develop linkages with downstream local food processing industries.
- Invest in agricultural infrastructure.
  - Ground water irrigation – shallow tubewells (STW) with appropriate institutional structures.
  - Surface water irrigation – for promoting the geographic spread of rabi season and for flood control.
- Marketing and storage facilities.
  - Double the number in three years.
  - Attain the level in Haryana within a decade.

40. The experience of the present STW programme, however, suggests that the technical intervention should have been supported by the required institutional reforms for achieving a qualitative breakthrough. The major institutional reforms required for Assam are summarized below.

1. Conceptually, the Field Management Committee (FMC) is an instrument which can assure participation of the people at the grass-roots in the process of planning and management of agricultural products besides representing a collective ethos for achieving a definite goal. At the empirical level, as it has been noted through the case studies cited earlier, the FMCs have become merely an official requirement for benefit of the relatively

better off farmers. Therefore, it is imperative to restructure the FMCs to assure effective participation of people at the grass-roots and to make it accountable to the people at large instead of any government department. The most effective mechanism will be to bring the FMCs under the purview of the Panchayati Raj which is likely to be revitalized soon in the state. Such a step will not be contrary to the provisions of the Assam Panchayat Act, 1994 which was enacted by and large in conformity with the 73rd Amendment of the Constitution.

2. Arranging the required technical training for the FMCs was a primary responsibility of the Department of Agriculture. The performance of the department, in this respect has, however, been extremely poor. Therefore, the department must be geared up to arrange adequate training for the farmers. Besides that, the administrative machinery of the department should also take appropriate steps to ensure support services to the farmers at the time of need.

3. As a part of an effective mechanism of marketing the products, it is imperative to bring the FMCs under a scientifically designed market information system.

4. Tenancy reform is another important step required for agricultural development in Assam. Despite the legal measures taken in the state since Independence against exploitative tenancy, as reported by NSSO in its 48th Round, the proportion of tenanted land in total operated area in Assam had increased from 6.4 per cent in 1981-82 to 8.9 per cent in 1991-92. The rate of growth is high, and probably, it continues to grow at the same rate, if not more. With the present practices of tenancy where the costs are not shared proportionately, as indicated earlier, at least 10 per cent of the operational area of the state will continue have low productivity. Therefore, the existing tenancy reform programmes should be implemented in the state more vigorously. So far, the issue has eluded any action.

Fisheries Development

41. It should be possible to increase fish production by 40000 tonnes a year in the next five years indicating a growth rate of 6 per cent per year. The perennial problem of fioods, under utilization of aquatic resources and low-lying areas, use of unscientific methods in fishing and indiscriminate poaching of brood fish are some of the main reasons for the current low fish production in the state. Development of storage and transport infrastructure to export fish to other states would however be required to exploit the potential fully. It is also important to ensure that fisheries are exploited rationally. Beel fisheries should be leased out for a longer duration to avoid overexploitation of fisheries. There is also a need to strengthen the cooperative movement in Assam to usher in a revolution in fish farming. The development strategies would consist of the following:

- According to the Department of Fisheries the state's ultimate potential is 400,000 tonnes annually. The existing production level is 160,000 tonnes. Twenty thousand tonnes of fish are imported, some from as far away as Andhra Pradesh. The estimated demand at the current market price is about 180 thousand tonnes. With population growth and increase in per capita incomes demand over the next five years can increase by 20,000 tonnes. To this one should add 20,000 tonnes to replace present imports. Thus, 40,000 tonnes of additional fish production could easily be absorbed in Assam. This implies a fisheries production growth rate of 6 per cent per annum.

42. The sizeable import of fish in Assam indicates the high cost of fish production in Assam. The acidic soil of Assam does impose a burden on fish producers. However, government action in other areas can reduce costs and increase productivity.

43. Apart from access to finance and development of storage and transport infrastructure the measures needed are as follows:

- It is important to ensure that fisheries are exploited rationally. Generally, the Assam Fisheries Development Corporation leases out the beel fisheries for a duration of one-to-three years. This leads to overexploitation of fisheries. It may be noted that there is no provision to control overfishing. Beel fisheries should be leased out for a longer duration (seven years as suggested by fisheries officials) so that there is incentive for the lessees to develop them. It requires about Rs 15,000 to develop one hectare of beel fishery and the investor cannot get the return of this investment in one year.
- To encourage modern aquaculture practices, integrated farming and pisciculture in agriculturally unsuitable land, extension services must be strengthened.
- Rearing of fingerlings is an essential prerequisite for obtaining optimum fish production. Stocking of fingerlings of the right size is the most important prerequisite for the success of beel fisheries. Though the state department has claimed to have reached self-sufficiency in production of fingerling, the problem of limited supply of quality fingerlings still persists. Adequate supply needs to be ensured.
- Strengthen co-operative movement to reduce marketing costs. The Assam Apex Cooperative Fish Marketing and Processing Federation Limited (Fishfed) was established in 1978 to work towards enhancing fish production in the state by encouraging activities of fisheries in cooperatives and also through its own production. However, Fishfed itself is now struggling for its survival. It needs to be revitalized.
- Asia's biggest dry fish market is located at Jagirod, Assam. It is a Rs 400 crore annual business and on average 400 truck load of dry fish is sold in this market every year. However, it is on the verge of closure with the sales dropping alarmingly following

imposition of eight per cent sales tax by the state government in 1999. That year it resulted in a 75 per cent drop in sales. The government needs to look into the implication of its policy.

- Like other departments of the government, fisheries department also suffers from excessive staff cost, leaving very little for development of fisheries.

Forestry and Wood Industries

44. Alarming deforestation in Assam led the Supreme Court to impose a ban on logging and movement of timber by trucks. This has adversely affected the wood industry in Assam. The Supreme Court ban, however, is till satisfactory working plans for sustainable exploitation of forests are developed. Unfortunately, most of forest divisions have not prepared their working plan. These must be prepared urgently to vacate the Supreme Court ban within a timeframe of months. Even with such plans there may be difficulties in reviving forest-based industry in Assam. The working plans act as a guide for rational exploitation of the forest. The national forest policy of 1988 lay down that the forest-based industries should meet their raw material need from private plantations. However, the forest conservation act of 1927, governs the felling of trees in private holdings. Only through amendment of this contradiction and encouraging large-scale plantation of quick growing species (QGS) forest based industries of the state can be revived.

45. The main causes of deforestation have been excessive logging for industrial uses for meeting fuelwood and other needs by households and for jhuming cultivation.

46. Joint Forest Management (JFM) programmes have been found to be effective for sustainable use of forest area in Assam at least as far as meeting needs for fuelwood, fodder and other non-timber forest products are concerned. Cooperation and effort from the poor villagers in the management and protection of forest cannot be expected unless economic security is provided to them. In most cases the villagers find it difficult to comprehend the mechanisms of the functioning of JFM. A massive motivational and training programme for the people to be involved in JFM can help to serve the objective. The service of VOs can be utilized for this purpose. Demand for fuelwood needs to be reduced by providing cleaner household fuels. Use of biofuels such as wood has an adverse impact on the health particularly of women and children. The use of kerosene and LPG is minimal in most of the villages due to their low economic status. There is scope and necessity to exploit rural energy components (improvized chulla, et cetera) with the JFM programme.

47. To arrest Jhuming one needs stricter regulation. However, regulation by itself will be difficult to enforce. The best mechanism is economic development and creation of alternative opportunities.

48. To encourage private entrepreneurs in sustainable forestry innovative use of market mechanism needs to be made.

49. To preserve forests and wildlife, unrestricted encroachment must be stopped in the forest of Assam. The rapid population growth in the state has put pressure on the land of Assam. So, the people have encroached the forest areas. The Revenue Department of the state is stated to be the main culprit as the department is providing *patta* (settlement rights) to the settlers in the forest areas. Area covered by the forest may not give the actual status unless the density of the forest is taken into account. There is need to use the information of remote sensing for regular monitoring of the forest areas in the state along with their crown densities. There is need to strengthen the Forest Protection Task Force. The outdated 303 rifles are not enough to counter the sophisticated weapons used by the poacher.

50. Above all massive plantation is the way out for sustainability of the forest areas of the state.

51. The following steps must be taken for successful implementation of the JFM programme in the state.

    - The service from the poor villagers in the management and protection of forest cannot be expected unless economic security is provided to them. In most cases they are fully or partially dependent on the forest for their livelihood. There is need to make provisions for other support activities for the people to be fully involved in JFM. Creation of assets and other activities such as horticulture, animal husbandry, bamboo cultivation etc. is an essential prerequisite.
    - There is the need to think of evolving a cost-effective alternative to fuelwood to the villagers, otherwise they will continue to exploit the forest.

Tourism

52. Assam and North-East have a vast potential for tourism and should be made a tourist hot-spot like Kerala. The region offers spectacular nature and scenery, unique and varied wild life, scope for adventure sports, cultural diversity and opportunities for relaxation in peaceful setting. To realize this potential, development of tourism related infrastructure such as good roads, telecommunication, good hotels and safari resorts, etc are essential. In addition, there is a need to develop tourist information and travel services. Fiscal and other incentives would also need to be given to private entrepreneurs to encourage a host of tourist related services such as hotels, restaurants, transport, etc. through soft loans and lower tax rates. An integrated approach to promote tourism in the North-East region as a whole could prove useful. The security scenario has to be improved to make Assam absolutely safe for all

tourists. Local people's involvement in tourism should be encouraged so that they benefit from this development.

53. To develop tourism to create awareness and facilities that fulfill expectations. For these the following needs to be done.
    - A policy of tourism for the state of Assam has to be evolved on the line of National Policy of Tourism, which incorporates broad policy guidelines to attract both domestic and foreign tourists, sets targets and monitors it.
    - A publicity drive has to market tourism aggressively.
    - All infrastructure connected with tourism should be developed.
    - To develop attractive packages desired by different tourists and provide services needs a flexible customer orientation best provided by private entrepreneurs. The government may offer fiscal and other incentives to the private entrepreneurs to take up a host of tourist related services. Transport, accommodation, and other logistics of tourism could be left to the private sector.
54. Tourism in Assam should not be viewed in isolation. Assam is the gateway to North-East which, as stated already, itself is a reservoir of natural beauty with great variety. An integrated approach to tourism in the region will be more effective. The North-Eastern Council should play an integrated role in this regard.

Concluding Observation

55. In the end, we should note that development of Assam is intricately linked with the development of the entire North-East. With sound policies and good governance, Assam should and can develop much faster than it has been doing. Until the security environment becomes conducive to private investment, the government needs to take the lead. Limited financial resources calls for responsible fiscal behaviour from the government and prioritization of expenditure becomes important. Based on the strengths of Assam in terms of its natural resources and the strong inter linkages with the rest of the economy, top priority needs to be given to agriculture and agro processing, fisheries, forestry and related industries and tourism. Assam can and should develop faster and catch up with the rest of the country.

1 Strategy for Assam's Development

1.1 State of Assam's Development – The Point of Departure

1. The most striking fact of Assam's economic development is that it is falling behind the rest of the country. In 1950-51, per capita income in Assam was 4 per cent above national average. In 1998-99, it was 41 per cent below the national average at current prices and 45 per cent below the national average at 1980-81 prices. See Table 1.1.

Table 1.1: Per Capita Income (at constant 1980-81 prices)

Year	1950-51	1960-61	1970-71	1980-81	1990-91	1995-96	1996-97	1998-99
India	1127	1350	1520	1630	2222	2608	2761	3132
Assam	1173	1140	1221	1284	1524	1606	1628	1708
Difference	46(+)	210(-)	299(-)	346(-)	698(-)	1002(-)	1133(-)	1424(-)
Assam/India	1.04	0.84	0.80	0.79	0.69	0.62	0.59	0.55

Source: Government of Assam Vision Assam 2025

2. What is even more alarming is that the gap is growing (See Figure 1.1). Between 1980 and 1990, per capita income at 1980-81 prices grew by 20 per cent in Assam compared with 40 per cent for all India. Between 1980 and 1998 per capita income in Assam grew by 10 per cent compared with 39 per cent for all India.
3. During 1951-79 Assam's economy grew at more or less the same rate as the rest of India. Yet, Assam's per capita income fell due to higher rate of population growth in Assam due to immigration. Over the period Assam's population grew at an average rate of around 4 per cent per year. The widening disparity since 1980-81 is, however, due to slower growth of its economy. While the Indian economy grew at 6 per cent over 1981 to 2000, Assam State GDP grew only at 3.3 per cent (See Table 1.2). While the growth rate of the Indian economy accelerated in the 1990s over 1980s, Assam's economy decelerated in the 1990s.
4. The poor growth performance is in all sectors as can also be seen in Table 1.2. Agriculture has grown only at 2.1 per cent per year over the 1980s and 1990s and has slowed down in the 1990s to 1.6 per cent. Manufacturing growth rate in the 1990s was higher at 3.4 per cent

compared to 2.4 per cent in the 1980s, while services growth has decreased marginally from 4.9 per cent to 4.5 per cent.

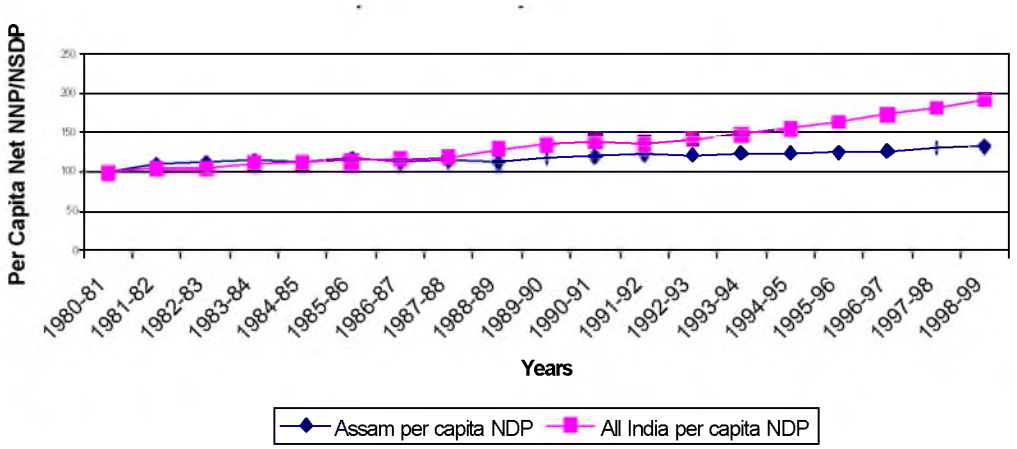

Figure 1.1: Comparison of Per Capita Net NNP/NSDP

Table 1.2: State GDP at Factor Cost by Industry of Origin at Constant (1980-81) Prices

Sector	Average Annual Growth Rates		Per cent of total SGDP			
	1981-82 to 1990-91	1990-91 to 1999-2000	1981-82 to 1900-00	1981-82	1990-91	1999-00
Agriculture, forestry, fishing and logging	2.6	1.6	2.1	41.6	38.3	33.5
Mining & Quarrying	0.1	2.0	1.0	5.2	3.8	3.4
Manufacturing	2.4	3.4	2.9	7.7	6.9	7.1
Construction	3.7	2.4	3.1	4.3	4.3	4.1
Electricity, Gas and Water Supply	9.4	0.9	5.0	1.2	1.9	1.6
Trade, Transport, Banking and Other Services	4.9	4.5	4.7	40.1	44.7	50.3
Gross SDP	3.6	3.1	3.3	100.0	100.0	100.0

The fall in the growth rate of electricity, gas and water supply was from 9.4 per cent per year in 1980s to 0.9 per cent in the 1990s. Construction sector has also slowed down in the 1990s. Many incomplete projects have made investment less effective. At the same time capital expenditure for development fell from 3 per cent of NSDP in 1980-81 to 1.5 per cent in 1997-98. The resulting poor growth meant fewer new jobs with rising educated unemployment. Governments in the past have followed the easy way out to increase government and public sector employment. Thus, labour-employing activities under public sector like electricity and water supply grew rapidly in the 1980s. The situation today is such that 90 per cent of Assam's tax and non-tax revenue inclusive of its share in central taxes and non-plan grants in 1997-98 went for maintaining the government servant, past and present, that is, for wages, salaries and pensions (NIPFP (1998), State Fiscal Studies: Assam P.40). Very little is left to do what the government is supposed to exist for. While most governments are more or less government of the employees, for the employees and by the employees, Assam's has truly become one. See Box A.

Box A: Government of the employees, for the employees and by the employees

Rapid growth of government and public sector employment has led to a dead end. The Assam government spends 90 per cent of its budget on salaries. Very little is left to provide services to the people or to invest in development.

To what extent, this has become a government for the employees can be seen from the fact that the government spends for reimbursement of medical expenses of its 4 lakh employees and their 16 lakh dependents more than that it spends for the remaining 250 lakh citizens of Assam for providing medical services.

The bloated government has also led to a fiscal crisis. The government has a monthly over draft of Rs 200 crore. It cannot mobilize even 10 per cent of the funds needed to benefit from many centrally sponsored development schemes with a 90 per cent grant component. It is unable to complete projects that go on forever delaying completion and increasing costs.

Downsizing government is the most pressing imperative if Assam is to develop faster.

5. It is not that Assam has made compensatory progress in other indicators of human welfare. Its progress in education and health shown in Table 1.3 and 1.4 is just about average for the

country. The literacy rate as per the provisional tables of 2001 census shows a decline in literacy compared to the NSS data for 1997 that is not credible.

Table 1.3: Literacy Rate (Per cent)

	Assam			India		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
1981	NA	NA	NA	43.56	56.37	29.75
1991	53.42	62.34	43.7	52.11	63.86	39.42
1997@	75	82	66	62	73	50
2001*	64	72	56	65	76	54

Source: Economic Survey Various Issues

@ National Sample Survey, 53rd round, Jan – Dec 1997; * Census of India 2001 (2001), Provisional Population Totals Paper 1 of 2001.

Table 1.4: Gross Enrolment Ratio (Per cent)

	Primary (I-V)		Upper Primary (VI -VIII)	
	Assam	**India**	**Assam**	**India**
1997-98	109.1	89.7	69.3	58.5
1998-99	109.63	92.14	61.12	56.8

Source: Economic Survey Various Issues

6. The progress in alleviation of poverty is also disturbing (See Tables 1.5 and 1.6). Compared to India, it has higher rural poverty and the decline has been much smaller in Assam. Rural poverty shows a decline only in recent years. Assam is the only major state in India that showed increasing rural poverty over a long period from 1957 to 1994, even though inequality as reflected in Gini coefficient, of consumption expenditure was falling. Urban poverty level has been lower in Assam. However, urban population constitutes only 11 per cent of the total population in Assam compared to 25.7 per cent in the country as per the 1991 census.

Table 1.5: Poverty in Assam (Head Count Ratio in per cent)

	Assam			India		
	Rural	**Urban**	**Total**	**Rural**	**Urban**	**Total**
1972-73	58.3	32.1	55.9	55.8	45.0	
1986-87	44.3	27.8	42.5	38.8	34.4	
1993-94	49.0	10.0	49.6	38.7	30.0	33.5
1999-00						
30 day recall	40-04	7.5	36.1			
7 day recall	34.00	6.3	30.6			

Source: Government of India (2001), Economic Survey 2000-2001 and www.indiastat.com

Table 1.6: Selected Indicators of Human Development

	LEB	**I.M.R.**	**Death Rate**	**Birth Rate**
	Years (1991-95)	**Per '000 in 1998**		
Assam	55.7	78	10.1	27.7
India	60.3	72	9	26.4

Where
LEB is Life expectancy at birth
I.M.R. is infant mortality rate
Source: Economic Survey Various Issues

7. Assam must grow faster and catch up with the rest of the country. How can Assam grow faster? To understand that we must first look at the reasons for Assam's poor record of development. We need to understand why a relatively prosperous state has become one of the poorest in the country.

1.2 Agriculture and Floods

8. Agriculture and allied activities have overriding importance as a source of livelihood to the people of Assam. It still contributes more than one-third (35.1 per cent in 1995-96) of its NSDP and supports about 70 per cent of its population. But the average operational holding size is small at 1.31 hectare as compared to 1.57 hectare for all-India. On top of it, 92.6 per cent of the cultivated land is flood prone.

9. Floods have been another exogenous source of handicap to the development of Assam. Floods in the Brahmaputra and Barak valleys of Assam cause "serious erosion, loss of life and livestock and heavy damage to infrastructure and property retarding agricultural productivity on account of risk avoidance and sand casting, disrupting communications and education and posing health hazards. The floods damage to crops, cattle, houses and utilities in Assam alone between 1953 and 1995 is estimated at Rs 4400 crore with a peak of Rs 664 crore in a single bad year." (Shukla Commission, 1997). The assessed flood prone area in the state is estimated at 3.15 m ha (million hectares) or 92.6 per cent of the cultivated land as in 1992-93, almost half of which (1.63 m ha) do not have any flood management structures. Even the limited flood management structures that exist are poorly maintained. The master plan prepared by the Brahmaputra Board estimates Rs 1848 crore at 1995 prices for short time measures and Rs 50,000 crore for long-term measures up to 2050. In the meantime, the state government continues with fire fighting operations and provides flood/ natural calamity relief causing a heavy drain on their otherwise meagre resources.

10. Floods have impeded the technological transformation of agriculture in Assam. For farmers do not apply costly inputs such as fertilizers and HYV seeds for the fear of their being washed away by floods. Floods can be moderated by maintaining the forests and arresting deforestation in the catchment area. This solution to moderating floods primarily rests outside Assam. In the short run, Assam has to learn to live with floods and make the best use of it. Recently, short duration variety of paddy has been developed which can be planted after the floods. Yet, as it is argued in Chapter 6, Assam's agricultural growth has to count on the rabi season. For rabi crops, irrigation is important. The success of the shallow tubewells programme shows that Assam's agriculture can develop rapidly.

11. Apart from floods, inadequate attention to agriculture has also been responsible for slow agricultural development. The asset creation in agriculture and allied activities stood at only one per cent of the total capital outlay of the Assam government in 1998-99 and even less (0.7 per cent) in 1992-93. The net irrigated area as percentage of the net area sown was only 20.6 per cent in 1995-96. Assam has also very few regulated markets for agriculture. Coupled with poor rural roads these result in farmers getting low price for their produce and thus have smaller incentive to produce more. The credit flow to agriculture is also very meagre. As of December 2000, in the entire North-Eastern states Kisan cards were issued to only 2590 persons and crop loan given was Rs 2.70 crore. It is not surprising therefore, that only 39.7 per cent of the cultivated land was brought under high yielding variety in 1994-95. The fertilizer consumption (NPK) per hectare was just 12.8 kg against 74.8 kg for all-India in 1995-96. Only 2.3 per cent of the total electricity consumption took place in agriculture sector against 28.2 per cent for rest of the country in 1991-92. As a consequence, the crop

productivity in the state was very low. For example, the productivity (kg per hectare) of its main crop, rice was only 71.7 per cent of the all-India average in 1997-98. Similarly, wheat productivity was only 52.6 per cent of all-India average.

12. All this clearly highlights partly the neglect of agriculture and partly the difficulty in increasing productivity with a high probability of floods that may wash away costly inputs. Its consequences on an economy with 89 per cent rural population are overwhelming. This is reflected in a much higher level of the people below the poverty line (36.09 per cent against 26.10 per cent for all-India) in 1999-2000.

1.3 Slow Industrial Growth

13. Industrial growth in Assam has been very poor (See Table 1.7) growing at only 2.6 per cent compared to 4.8 per cent in the country. Industries grow when the demand for their products grow. If the local market does not provide enough demand then external markets are needed. Moreover, the output has to be sold competitively. Industries in Assam and other North-Eastern states have not had adequate markets. Outside the region, they have not been able to compete because of the high transport cost. Within the region they have lacked good infrastructure. We look at these in turn.

Table 1.7: Index Number of Industrial Productions (1970=100)

	1970	1997	1970-97 Growth rate
Assam	100	202	2.6
India	100	357	4.8

Source: Economic Survey Assam, 1998-99, Directorate of Economics and Statistics, Assam
Economic Survey 2000-2001, Ministry of Finance, Government of India

1.3.1 The Transport Disadvantage

14. The Partition of the country imposed on Assam and the North-East a huge transport and access disadvantage. As the Shukla Committee put it, "Partition further isolated an already isolated geo-politically sequestered region. It was left with over 4500 km of external frontier with Bhutan, China, Myanmar and Bangladesh but no more than a slender 22 km connection with Indian hinterland through the tenuous Siliguri corridor, the Gateway to the North-East. The very considerable market disruption, socio-economic distancing and retardation that

resulted has not been adequately appreciated and compensated.[1]" Once goods have to be transported around Bangladesh through the Siliguri "chicken neck" and cannot go through Bangladesh, Kolkata becomes a far off city. The distance between Kolkata and Agartala is 300-odd km through Bangladesh but is 1700 km via the "chicken neck". Even for Guwahati, Kolkata has receded by 500 km. This transport disadvantage discourages industry from locating in Assam. Only those industries that are based on special raw materials available in the North-East are likely to locate here. If a firm has to import raw materials from India over the large distance that it involves and transport the finished products back to India, its costs mount and the firm may not remain competitive. To move a 9ton truck from Guwahati to Kolkata, a distance of 1100 km, today costs around Rs 20,000. A truck going from Chennai to Kolkata, a distance of 1600 km, costs only Rs 16,000. This also reflects on the quality of road connecting the North-East with the rest of the country. In the pre-partition days, boats laden with tea, coal and timber reached Kolkata from Dibrugarh in 8 days. But now Kolkata-Guwahati takes more than 25 days due customs formalities at various points. The transport cost has increased. The net effect has been that people pay higher prices for goods imported from the rest of the country and Assam's producers do not get right prices for their products.

15. Of course, one could have developed industries to supply the North-East market itself. The high transport cost would have provided some protection. This did not take place. This suffered from lack of infrastructure within the North-East in the early decades after Independence. This led to a much slower growth of industries and incomes in North-East and Assam than in the rest of the country. Once industrial growth stagnated so did income growth and the growth of demand for manufactured goods slowed down in turn. Thus, even industries to serve North-East demand did not grow. A vicious circle developed.

16. While significant progress in infrastructure development has been made in recent years, other developments have overtaken it and negate whatever cost advantage infrastructure development may have given. How much of a burden corruption of all kinds and extortion by different underground groups impose on transport cost even within the region has been documented by Sachdeva (2000). A moving truck load of goods from Moreh to Dimapur, a distance of 316 km, costs Rs 50,000. Part of these charges may be due to the fact that the truck was carrying illegally traded goods. Yet the number of "tax collectors" are likely to collect something from trucks carrying legally traded goods too. These "taxes" must act as a significant disincentive to any one thinking of setting up an industry in the North-East to

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[1] Planning Commission, GOI, (1997), High Level Commission, Transforming the North-East-Tackling Backlogs in Basic Minimum Services and Infrastructural Needs, Part I.

meet North-East demand. This refers to Manipur and Nagaland. The situation in Assam is much better. We have noted that carrying a truck from Guwahati to Kolkata over a distance of 1100 km costs Rs 22,000. Yet the high transport costs in other NE States restrict market reach of industries located in Assam. Traders claim that to move a truck from Imphal to Guwahati (487 km) costs Rs 35,000.

17. The transport disadvantage is not just for movement of goods and raw materials. It also makes movement of people expensive too. Businessmen who have to visit Kolkata for meeting suppliers, customers, etc. suffer a big handicap. To travel by train takes time and requires advance planning that is not always possible. It costs more to fly and since convenient flights for returning the same day are not available, a trip to Kolkata requires spending a night in a hotel adding to the cost. Small businessmen could hardly afford this.

18. The army and the railways demand significant goods in the North-East. Some industries could have been developed to meet these demands. Unfortunately, products have to be tested and certified for their quality. This, however, is done in Kolkata. A supplier may have to make few trips to Kolkata, the cost of which small entrepreneurs could ill afford. Of course, if testing and certification facilities are set up on Guwahati, this disadvantage could be overcome.

1.3.2 Infrastructure: Improved but Still Inadequate

19. Infrastructure of road, rail, water and air, transport, power, telecommunication and finance are vital for development in general and industrial development in particular. The development of infrastructure, roads, railway, power and telecommunication in Assam has also not kept pace with that in the rest of the country. Chapter 5 gives a details loot at infrastructure. Though Assam's infrastructure has improved in recent years it is still inadequate. More needs to be done. Yet it only recently reached a state where industrial development can be somewhat accelerated. In the new liberalized economy where government is getting out of industrial activities, government's role is that of a facilitator. It should create an environment where private industries are attracted and can flourish. The scope for industrial planning is thus restricted to identifying industries where Assam has comparative advantage (See Chapter 5) and to target promotion policies to such industries. Government can also provide special incentives to offset some disadvantage.

1.3.3 Special Packages and Incentives

20. The Assamese have a feeling of neglect by the Centre and feel that the Centre has not treated them fairly. How else could one explain the relatively poor growth of Assam's economy? Has Assam been neglected? Table 1.8 shows the expenditure on different plans of Assam and all states. It also shows expenditure on Assam plan as a proportion of expenditure on all state plans. Since Assam's population has been around 2.5 to 2.6 per cent of India's population.

On that basis, prima facie it may seem that expenditure on Assam's plan on a per capita basis have been equitable and that Assam has not been discriminated against. However, one cannot say, that Assam has been treated specially. Considering the disadvantage that partition imposed on Assam, it should have been specially treated. To this extent, the sense of neglect is justified. The constitution of number of Special Committees, Commissions and study groups and the announcement of special packages by Prime Ministers indicate that the country in recent years have been concerned about development of Assam and North-East. Thus, in addition to many projects and larger size plan, many tax concessions are also offered to attract industry to the region. More needs to be done. For example, the Centre has liquidated a debt of several thousand crore of Punjab Government due to insurgency. But in case of Assam, no positive action has been taken till today in spite of repeated request from Assam Government to liquidate debt due to expenses on insurgency. Central relief for floods in Assam is extremely meagre compared to the havoc created by floods and in comparison to allocation for floods to other states. Also, if Assam is to be deprived of tourism by travel restrictions or if the North-East is not allowed to beneflt from the communication revolution of cellular telephony for considerations of national security, the Centre ought to compensate Assam in other ways so that its development does not suffer.

Table 1.8: Plan Expenditure (Actuals)

(Rs in crore)

S No	Plan Period	Centre Plan	All State Plans	Assam Plan	Assam/All State (%)
1.	**First plan (1951-56)**	706	1245	28	2.25
2.	**Second plan (1956-61)**	2535	2115	63	2.99
3.	**Third plan (1961-66)**	4212	4227	132	3.13
4.	**Annual plan (1966-69)**	3401	3118	87	2.79
5.	**Fourth plan (1969-74)**	7826	7675	198	2.59
6.	**Fifth plan (1974-79)**	18755	20015	429	2.14
7.	**Annual plan (1979-80)**	5695	6291	160.7	2.54
8.	**Sixth plan (198-85)**	57825	49458	1280	2.59
9.	**Seventh plan (1985-90)**	127520	87492	2490	2.85
10.	**Annual plan (1990-92)**	72101	48856	1396	2.86
11.	**Eighth plan (1992-97)***	328906	188449	4987	3.86

* Eighth plan expenditure is based on 1992-93 (actuals), 1993-94 (actuals), 1994-95 RE, 1995-96 RE and 1996-97 BE

Source: Economic Survey and Annual Plans of different years); www.planningcommission.nic.in and Planning Commission.

21. Successive governments in recent years have offered many concessions to industries in the North-East. These reduce their tax burden to compensate them for the transport disadvantage to attract them to locate in the region. The New Industrial Policy for the North-East announced by the Government of India offers many concessions. It gives grants to set up industrial estates, transport subsidy, a variety of fiscal incentives, assistance for techno-economic studies and so on. Box B lists these incentives. In addition, the state government offers further incentives. These are listed in Box C.

22. These are very attractive incentives. However, as long as the taxes waived by the government are collected by others, these incentives would not be effective. If the problem of governance can be solved, Assam should now be an attractive place for many industries.

23. Unless extortion by various insurgent groups, which seems to have been the fastest growing activity, is brought under control, industrial growth is unlikely to accelerate. Assam is a uniquely complex state with its ethnic diversity, Bangladeshi immigrants and an educated and cultured middle-class frustrated by Assam's poor economic development. We need to understand better how militancy and insurgency can be contained. A separate study on militancy should be carried out.

24. Effective governance thus is a most vital necessity for development.

Box B: Main Features of Government of India's New Industrial Policy for the North-East

I. Development of Industrial Infrastructure

(a) Government of India will provide entire expenditure on the establishment of Industrial Growth Centres (Upto a ceiling of Rs 15 crore as against Rs 10 crore admissible earlier).

(b) Government of India would provide 80 per cent funds for Integrated Industrial Development Centres (IIDCs) as grant (as against 40 per cent earlier) and balance 20 per cent would be by SIDBI.

II. Transport Subsidy Scheme

The transport subsidy will be extended for a further period of seven years, i.e., up to 31st March 2007.

III. Fiscal Incentives

(a) The Industrial Growth Centres and IIDCs would be total tax free zone for the next 10 years. All industrial activity in these zones would be free from income tax, excise, for a period of 10 years from the commencement of production.

(b) Industries located in the growth centre would also be given capital investment subsidy at the rate of 15 per cent of their investment in plant and machinery, subject to a maximum ceiling of 30 lakh.

(c) The commercial banks and the NEDFi will have dedicated branches/counters to process applications for term loans and working capital in these centres.

(d) An interest subsidy of 3 per cent on the working capital loans would be provided for a period of ten years after the commencement of production.

(e) Similar benefits would also be extended to the new industrial units or their substantial expansion in other growth centres or IIDCs or industrial estates/parks/export promotion zones set up by the states in the North-East region.

IV. Relaxation of PM's Rozgar Yojana Norms

The PMRY would be expanded in scope to cover areas of horticulture, piggery, poultry, fishing, small tea gardens, etc. so as to cover all economically viable activities. PMRY would have a family income ceiling of Rs 40,000 per annum for each beneficiary along with his/her spouse and upper age lim it will be relaxed to 40 years. Projects costing upto 2 lakh in other than business sectors will be eligible for assistance. No collateral will be insisted for projects costing upto Rs 1 lakh. Group financing upto Rs 5 lakh will be eligible. Schemes will have a subsidy component @ 15 per cent with an upper ceiling of Rs 15,000. The margin money may vary from 5 per cent to 12.5 per cent of the project cost to make the subsidy and margin contribution at 20 per cent of the project cost.

V. Other Incentives

(a) A comprehensive insurance scheme for industrial units in the North-East will be designed in consultation with General Insurance Corporation of India Ltd. And 100 per cent premium for a period of 10 years would be subsidized by the Central Government.

(b) A one-time grant of Rs 20 crore will be provided to the NEDFi by the Central Government through NEC to fund techno-economic studies for industries and infrastructure best suited for the region.

(c) State Governments may consider setting up of a "Debt Purchase Window" by the NEDFi which buys the debt of the manufacturing units particularly in respect of the supplies made to Government Departments so as to reduce the problem of blocking of funds for these units.

(d) It may be considered to provide assistance for restructuring State PSUs from the national Renewal Fund.

VI. Procedure for Release of Assistance Under the New Initiatives

Currently central assistance for transport subsidy is given on reimbursement basis. The expenditure is first incurred by states and then reimbursement claimed from the Centre. Releases under the growth centre scheme are made taking into consideration the physical and financial progress and release made by the State Governments. Inadequacy of funds with states delays the releases which affects the entrepreneurs to hardship. So, it was decided that the transport subsidy budget would be released by a designated agency on the basis of the recommendations of S.L.C. NEDFi would be designated as the nodal agency for release of transport subsidy.

VII. Development of Village & Small Industries

Weavers' Service Centres in the region and Indian Institute of Handloom Technology at Guwahati would be suitably strengthened to provide technology and training support to the weavers. National Handloom Development Corporation will give priority in supply of hank yarn to the NE region. All the four varieties of silk would be covered under the Mill Gate Price Scheme. Priority would be given to the region in schemes setting up of market complexes and permanent exhibition facilities. A new design centre for development of handicrafts would be set up in the region. New emporia would be set up and financial assistance for renovation of existing emporia would be provided. Central Silk Board would give priority to the region in its schemes.

Source: Office Memorandum No. EA/1/2/96-IPD, Department of Industrial Policy and Promotion, Ministry of Industry, Government of India. 24 December 1997.

Box C: Incentives for Industries in Assam given by the State Government

Power Subsidy

Connected Load	Amount of Subsidy	Ceiling on Subsidy (per unit per year)
Upto 1 Mw	50 per cent	Rs 5 lakh
Above 1 MW and Upto 5 MW	30 per cent	Rs 15 lakh
Above 5 MW	20 per cent	Rs 30 lakh

Interest Subsidy on Working Capital

Rate: 5 per cent subsidy to SSI Units with an investment upto 60 lakh
Period: 3 years from the date of production
Maximum Benefit 3 lakh per year per unit

Sales Tax Exemption

Category	SSI/Tiny/SSSEBs	Medium and Large
New Unit	7 years subject to maximum of 150 per cent of fixed capital investment	7 years subject to maximum of 100 per cent of investment
Units undergoing expansion /diversification/ modernization	7 years subject to maximum of 100 per cent of additional fixed capital investment	7 years subject to maximum of 90 per cent of additional fixed capital investment
Six/relief undertaking units	3 years subject to maximum of 100 per cent of additional investment made for rehabilitation	3 years subject to maximum of 90 per cent of additional investment made for rehabilitation
Electronic Industries	7 years subject to maximum of 250 per cent of fixed capital investment	7 years subject to maximum of 250 per cent of fixed capital investment.

Equity Participation

AIDC or ASIDC may participate in the equity participation up to 20 per cent of the issued capital of the company subject to a ceiling of Rs 20 lakh.

Feasibility Study Cost

For large and medium scale units, 90 per cent subsidy on cost (ceiling Rs 2 lakh) in each case.
For SSI, 100 per cent or 90 per cent subsidy on cost (ceiling Rs 50,000).

State Capital Investment Subsidy (SCIS)

A special SCIS @ 30 per cent of the capital investment on land, building and plant, machinery etc., subject to ceiling of Rs 10 lakh.

Subsidy on Generating Cost

50 per cent of the cost of generator (ceiling Rs 10 lakh per unit).

Infrastructural Facilities

In case, an undeveloped land is allotted to entrepreneur for industrial purposes, actual land development cost will be provided as an interest free loan with certain ceilings.

Manpower Subsidy

If loan persons are employed and trained in industrial units, the following subsidy per person would be provided: Manager: Rs. 10,000, Supervisor: Rs 7,500, Skilled Worker: Rs 5,000, Unskilled Worker: Rs 2,000. This is subject to the following ceiling:

Units with investment	Total ceiling
Upto 2 crore	Rs 1 lakh
2 to 5 crore	Rs 2 lakh
5 to 10 crore	Rs 5 lakh
10 crore and above	Rs 7 lakh

Pioneer Unit

If a new unit with fixed capital exceeding Rs 3 crore is set up in a no industry district, an additional SCIS of 5 per cent of fixed capital investment (ceiling Rs.10 lakh) as well as power subsidy for an additional 2 years would be provided.

Incentives for Export Oriented Units

For 100 per cent EOUs additional SCIS of 10 per cent (ceiling Rs 10 lakh); additional 20 per cent subsidy for purchase of testing equipments (ceiling 2 lakh). Incentives also for other units with an export effort.

Agro & Food Processing Industries

Additional SCIS of 5 per cent (ceiling Rs 5 lakh); 50 per cent of cost payable for getting FPO license / AGMARK etc. (ceiling 1 lakh).

Women Entrepreneurs

Additional SCIS of 5 per cent (ceiling Rs 5 lakh) where women constitute 50 per cent of labour force.
Additional 2 per cent interest subsidy on working capital for 3 years (ceiling Rs 1 lakh per year).
75 per cent subsidy on factory shed rent for 5 years.

Physically Handicapped Person

Additional SCIS of 5 per cent (ceiling Rs 5 lakh).
Additional 2 per cent interest subsidy on working capital for 3 years (ceiling Rs 1 lakh per year).

Handicraft Industries

Additional SCIS of 10 per cent (ceiling Rs 2 lakh).
Additional 2 per cent interest subsidy on working capital for 3 years (ceiling Rs 1 lakh per year).

Other Subsidies (applicable on units where fixed capital does not exceed Rs 5 crore)

20 per cent of cost payable to Assam State Electricity Board for drawing HT/LT line up to the unit and installation (ceiling Rs 1 lakh); 50 per cent of fees paid for procurement of know how from National Research and Development Corporation or other agency (ceiling Rs 1 lakh); 50 per cent of the cost of pollution control and monitoring (ceiling Rs 2 lakh); 50 per cent of the cost of quality control equipment (ceiling Rs 1 lakh).

1.4. Strategy for Development

25. Assam's economy has to accelerate and catch up with the rest of the country. Assam has come to a state where this seems possible. Infrastructure is in a better shape in terms of roads and railways. Civil aviation can be quickly improved. Power situation can be made better soon if projects under implementation are quickly completed. Telecommunication is growing rapidly and the new technology makes it possible to get connected from any place at modest cost without waiting for government to invest in capacity creation and network expansion. Finance is now relatively easier to obtain.

26. The new refinery at Numaligarh opens up the possibility for downstream petrochemicals industries that can stimulate many small-scale industries. Since the raw material is local, the transport disadvantage is only for selling products to rest of the country for which the various incentives and concessions should suffice.

27. Yet Assam and the development of the North-Eastern states can get a big boost if trade with neighbouring countries like Bangladesh, Myanmar and China can be made freer. The Ministry of External Affairs can do more for the North-East than perhaps what Planning Commission can do. One cannot, however, plan one's strategy on such hopes.

28. The creation of a network of institutions to impart skills and establishment of computer information centres in all the blocks provide an opportunity for private initiatives to flourish. The ICT revolution knows no geographical distance and the transport disadvantage does not exist in satellite communications. A signal bouncing of a geostationary satellite travels the same distance when you talk to your neighbour or to someone across the world. An attractive new opportunity has opened up for service-based development.

29. The implementation of the package announced by Prime Minister Vajpayee will give a big thrust to the region's economy. The continuous monitoring of the various measures in a transparent manner where the progress report can be tracked on a website updated every three months, offers hope that these measures will be implemented. Thus the stage is set for Assam to take off.

30. A development strategy based on mega-projects implemented by government has not succeeded. Somehow, the projects go on forever, the costs mount and benefits get delayed for long. A strategy of development led by many small entrepreneurs and initiatives all over the state is more likely to succeed. Assam's development has to be built on the initiatives and actions of people of Assam on a large number of issues all over the state. Large projects undertaken by the Central or State governments can only play an enabling role and a very limited one at that. The many packages announced by successive Prime Ministers based on various committee reports have led to disappointing results. We feel this is largely due to the

fact that they were top-down projects and did not build on the creativity and talent of Assamese people. As economist, Atul Sharma observed, "Initiatives have to be of such expanse and order that people, more importantly, young people, and women clearly perceive that something is happening all around them and that the future holds out a lot of promise". All these initiatives need not be very costly. It is critically important to develop institutional mechanism particularly to provide accountability and to shake up non-performing systems. For this, decentralization and devolution of financial resources to local Panchayats is necessary. For accountability of Panchayats, other local bodies and government, a right to information should be given to the people through an act.

31. If the gap between average income in Assam and the country is to be narrowed, Assam's economy should grow at a faster rate than the 6 per cent rate at which the Indian economy is growing. To accelerate to such a rate in a short period may be unrealistic. We believe, however, that a minimum growth rate of 6 per cent per year can be realized over the next five years. Such a growth rate will reduce rural poverty from 40 per cent to 28 per cent in five years, if income distribution does not worsen in the process. The opportunities available to Assam are such that a widespread growth is possible, which, if anything, should improve income distribution.

32. A 6 per cent growth rate in the next five years should be just the beginning. Assam and North-East development must accelerate beyond that so that by 2020 they catch up with the rest of the country. This requires that after five years, Assam's economy to grow by 2 percentage points faster than the Indian economy. A strategic long-term vision for the region should be developed.

33. If Assam's development is to be based on its natural resources and on a participatory basis, the following sectors will play important roles:

    - Agriculture
    - Horticulture and Agro Processing
    - Silviculture and Handicrafts
    - Fishery
    - Forestry and related industries
    - Tourism
    - Petrochemicals and related industries
    - IT based services

These are obvious and well-known. We have tried to explore: what has constrained development of these sectors? What should we do now that is different and would lead to better results? These are critical questions.

34. Assam's agriculture sector has the potential to grow much faster. The recent experience with shallow tubewells shows great potential when it is coupled with participatory local management. We noticed a lot of enthusiasm about shallow tubewells. One village we visited showed spectacular results. However, even the Jain Committee promoted shallow tubewells and noticed that some 43000 shallow tubewells were already installed by 1990. Then how come a mere 60000 tubewells in the last couple of years are creating such excitement? What is the reason? Under what circumstances and what institutional arrangements, shallow tubewells bring about real agricultural growth? These issues will be addressed in subsequent chapters.

35. Fishery would seem to be an obvious growth sector for Assam. Assam has vast water resources. Brahmaputra and the beels provide opportunity for fishery development on a widely dispersed large-scale so that many can share in it. Yet Assam imports some 25000 tonnes of fish from Andhra. Why is it so? There is nothing wrong in importing fish if it is economic to do so. Imports do indicate the potential market for development of fisheries. It should be possible to increase fish production by 40000 tonnes in the next five years indicating a growth rate of 6 per cent per year. What prevents development of intensive fisheries? What needs to be done? What kind of institutional arrangements are needed? These are examined in a later chapter.

36. Forests are a major resource of Assam. What has been the experience with joint forest management? What are the consequences of the Supreme Court ban on the industry? How to achieve sustainable forestry and related industries development?

37. Assam has vast potential for tourism. It can develop cultural, lifestyle (tea), adventure and eco-tourism. There are more than 1000 tea gardens, many with guesthouses, some with golf-courses, air strips and helipads. Assam has wildlife and bio-diversity with two sites that are recognized by the UN as Ramsar sites, that is, wetlands that are unique, rare or representative and internationally important to preserve biodiversity. North-East has also unique cultural and ethnic diversity. The rivers, forests and mountains provide scope for adventure and eco-tourism. Tourism in the North-East should be booming. How can one develop it? What is missing? Is it just insurgency? If so, we should emphasize that no tourist has been harmed by insurgents. What prospects are there for making it a major growth industry? In the first phase Assam should concentrate on developing domestic tourism. Indians travel a lot and Assam and North-East should be made a tourist hot-spot like Kerala has become.

38. All these developments require resources. How much is needed? What is the prospect of raising them? To explore these, one chapter deals with macro scenarios of economic development, and shows that a 6 per cent growth rate is within reach of Assam.

39. Apart from growth of economic activities, development requires social development too. Another chapter deals with poverty and social development.

40. Government has important role to play. Apart from creating a facilitating environment that promotes private initiative and supports participatory development, it needs to provide social services, infrastructure and good governance. It will have to put its fiscal house in order. A chapter deals with how to reorient fiscal strategies towards economic development.

41. All these possibilities and needed policies are discussed in subsequent chapters.

42. Before concluding, let us note that while this report deals with development of Assam, it is intricately linked with the development of the whole North-East. They need each other's markets. Provision of infrastructure and development of tourism become easier when done for the whole region. Also, the States of the North-East have complementary resources. A concerted effort should be made to accelerate the development of all the States of the North-East.

43. Assam should and can develop much faster than it has been doing with sound policies and good governance.

1.5 Summary and Recommendations

The main recommendation that emerge from this analysis are:

a) The most striking fact of Assam's economic development is that it is falling behind the rest of the country. From a per capita income above the national average in 1951, it is now barely 60 per cent of it. Assam's economy has to accelerate and catch up with the rest of the country. A minimum growth rate of 6 per cent per year can be realized over the next five years which will reduce rural poverty from 40 per cent to 28 per cent in five years

b) Assam should aim to catch up with the rest of the country. This requires that after five years of 6 per cent growth rate Assam's economy has to grow by 2 percentage points faster than the Indian economy.

c) The Partition of the country imposed on Assam and the North-East a huge transport and access disadvantage. While Assam could have developed industries to supply the North-East market itself, lack of infrastructure within the North-East in the early decades after Independence prevented such development.

d) Assam's transport infrastructure has improved but it is still inadequate. More needs to be done.

- Maintenance of existing roads needs to be improved as many roads are in poor state and all weather connectivity for many villages is limited
- Congestion on the Siliguri-Guwahati sections of the railway should be relieved either by double tracking or providing adequate bypass siding.
- Army and the railways testing and certification facilities should be set up in Guwahati,
- Bridges across Brahmaputra are extremely important for connectivity and there are only three bridges today.
- Air connectivity is vital for a modern economy. To develop tourism, it is a must. Fuel price and tax concession are offered to encourage internal air services within the North-East should be continued.
- Convenient same day return flights to Kolkata are needed.
- The inland water transport network was disturbed by partition and further disrupted by the earthquake of 1950. Its revival needs a coordinated effort to provide infrastructure support and night facilities.

e) Per capita electricity consumption in Assam is only one-fourth of the All India consumption reflecting the poor quality of life and low level of economic activity. If all the projects that were under implementation in March 1996 were to be completed, the NE would have a total installed generating capacity of 3396 MW, enough to meet its demand for some years. The work on these projects proceeded at a slow pace due to lack of funds. The gap between the average cost of supply and the average tariff is a phenomenal figure of Rs 4.50 per unit. Power sector reforms have become critical to improve the financial position of ASEB and should be steadfastly pursued.

f) Apart from pressing for more funds for large hydel projects conceived years ago a fresh look at them should be taken for alternative designs taking into account their social and environmental consequences.

g) A world-class telecomm service at low international prices offers an opportunity to Assam to develop and to overcome its traditional access disadvantage. Government policy must facilitate development of telecommunications in the North-East which has difficult terrain and many remote villages.

h) Availability of credit is critical for development of small enterprises that in turn, is crucial for Assam's development. The credit disbursed by banks and financial institutions needs to be stepped up.

i) Unless extortion by various insurgent groups, which seems to have been the fastest growing activity, is brought under control, industrial growth is unlikely to accelerate despite many tax

concessions and very attractive incentives given to industries to compensate them for the transport disadvantage as long as what the government gives other "tax collectors" collect.

j) We need to understand better how militancy and insurgency can be contained. A separate study on militancy should be carried out.

k) Trade with neighbouring countries like Bangladesh, Myanmar and China can be made freer. The Ministry of External Affairs can do a lot for the North-East.

l) Government has an important role to play in the development of Assam. It needs to provide social services, infrastructure and good governance. It will have to put its fiscal house in order. It is so starved of funds today that it cannot even find the 10 per cent needed to benefit from central projects. Downsizing government is a most pressing imperative if Assam is to develop faster. Fiscal strategies towards economic development are examined in a subsequent chapter where specific recommendations are given.

m) It is critical to develop institutional mechanism particularly to provide accountability and to shake up non-performing governance systems.

n) Decentralization and devolution of financial resources to local Panchayats should be done as soon as possible.

- A right to information should be given to the people through an Act, so that local bodies function in a transparent manner.
- The stage is set for Assam to take off. The implementation of the package announced by Prime Minister Atal Bihari Vajpayee will give a big thrust to the region's economy. Attractive new opportunity has opened up for service-based development due to the ICT revolution.

o) A strategy of development led by many small entrepreneurs and initiatives all over the state is more likely to succeed, where young people and women clearly perceive that something is happening all around them and that the future holds out a lot of promise. Such decentralized development is less likely to be a victim of extortions.

p) Assam's development has to be based on its natural resources and on a participatory basis. The following sectors offer much scope for development

- Agriculture
- Horticulture and Agro Processing
- Silviculture and Handicrafts
- Fishery
- Forestry and related industries
- Tourism
- Petrochemicals and related industries
- IT-based services

q) Agricultural growth can be stepped up with a continued emphasis on shallow tubewells, formation of village development councils, development of rural roads and establishments of organized markets.

r) It should be possible to increase fish production by 40000 tonnes a year in the next five years indicating a growth rate of 6 per cent per year.

s) Assam and North-East have a vast potential for tourism and should be made a tourist hot-spot like Kerala has become.

t) Revival of forestry and wood industries requires development of plans for sustainable use of forests. Innovative actions may be needed to implement them.

u) Assam's handicrafts need to be marketed to obtain high prices for them. This requires a modern design and marketing set up that targets high-income consumers in the world. A system to encourage private designers and entrepreneurs needs to be evolved.

v) Assam's unique Muga silk has not seen any technological development as hardly any research effort has gone into it. A silviculture research institute should be set up in Assam.

w) Development is incomplete without social development. A chapter deals with poverty and social development and suggests specific measures.

x) We should also note that development of Assam is intricately linked with the development of the whole North-East. With sound policies and good governance Assam should and can develop much faster than it has been doing.

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2 Prospects for Economic Growth

2.1 Backdrop

1. Assam is the largest state among 'the seven sisters' in the North-East region of India. It was counted among the economically prosperous states of the country in the early 1950s. It has continuously slipped down since then in the process of economic growth compared to other states. The social and economic development process of Assam has been affected by the two wars in the eastern front of the country and large-scale migration of people from Bangladesh. While inadequate state income growth itself might be attributed as part of the causes of the social tension and movements during the seventies and eighties, the growth process itself got adversely affected due to the movements in the subsequent period. The economic, social and political environments are obviously inter-dependent. The stage now seems to be set for an accelerated growth of the state's economy. Given the natural and human resource potential of Assam, the need for higher growth has recently been felt by various sections of the people as well as the state and Central governments.

2. Assam accounts for about 2.4 per cent of total geographical area in the country and 2.6 per cent of India's population. The density of population at 340 per square kilometre is slightly higher than the all-India density of 324 as per 2001 census data. A noteworthy recent demographic feature is that the population growth rate has been 1.7 per cent per annum during 1991-2001 in Assam. This is a little lower than the national level growth and indicates migration to be under control in the 1990s. The rate of urbanization in Assam is low with urban areas accounting for only 12.8 per cent of the total population in 2001 compared to the all-India rate of 27.8 per cent. Social development indicators like literacy rate and infant mortality rates in Assam at 64 per cent and 71 per thousand respectively are just about the all-India rates in 2001. It is against this background that we make an assessment of the medium- and long-term growth prospects of Assam in this chapter.

2.2 Income Levels

3. It is only natural to start the discussion with income levels. The per capita income of Assam was a little higher than the all-India level in the early 1950s. It has not grown as fast as the per capita income in rest of India since then and consequently slipped down to remain substantially lower than the national average in recent decades. Further, the gap

between the state's average level of living and that of the national average has been increasing in recent years. The average per capita income of Assam stood at Rs 1374 for the triennium 1980-81 to 1982-83 at 1980-81 prices. It was about 18 per cent lower than the corresponding national estimate of Rs 1672 for India as a whole. The difference widened to more than 45 per cent in recent years when average per capita income of Assam and all-India stood at Rs 1702 and Rs 3211 respectively at 1980-81 prices for the triennium 1999-00 to 2001-02. Both Table 2.1 and Figure 2.1 reveal comparisons of income at constant 1980-81 prices. Similar comparison at current prices shows a difference of about 40 per cent in recent years[1].

2.3 GSDP Growth Rates

4. The trend growth rates in the gross state domestic product (GSDP) in real terms since 1980-81 is shown in Table 2.2. As this table indicates GSDP has been growing at a trend rate of about 3.3 per cent per annum during the period 1980-2001. While the growth rate at the all-India level has picked up after the initiation of the economic reform process in 1991, the Assamese economy does not indicate any change in the trend growth rate in the post-liberalization period. Indeed, Assam's current growth rate is comparable to the 'Hindu' growth rate that Indian economy had prior to mid-1970s. This relative stagnancy in the state's economy for over two decades and specifically in the post-reform era is obviously a matter of deep concern.

5. Table 2.2 also shows the trend growth rates by three broad sectors: primary, secondary and tertiary. The primary sector has grown at around 2 per cent per annum during the 1980s as well as 1990s. The growth rates in the secondary and tertiary sectors too have remained the same at about 4 and 4.5 per cent respectively. There has been a marginal fall in growth rates of primary and secondary sectors that has been compensated by a marginal rise in service sector growth. But, overall it is again a picture of stagnancy in growth rates for the three sectors.

2.4 Poverty

6. This stagnancy in per capita income growth gets reflected in movement of poverty ratio in Assam. Table 2.3 gives the official estimates of percentage of people below poverty line in Assam and all-India. This too reveals that Assam had a lower incidence of poverty at 51 per cent in 1973-74 than the national average of 55 per cent. But, the fall in poverty ratio since then has been slower in Assam compared to the all-India level. Particularly after the liberalization process, extent of poverty has been reduced by about 5 per cent

[1] We might just clarify that the concern here is not that a state's per capita income remains below the national average for a particular year. By the very logic of the averaging process, some states would remain below the national mean and some above. The point of concern is the long run widening of inter-state income differential and a state like Assam not realizing its full growth potential.

between 1993-94 and 1999-2000 in Assam as against about 10 per cent for India as a whole during the same period. These developments led to a situation where about 36 per cent of Assam's population remained below the poverty line in 1999-2000 as against 26 per cent for India as a whole. As we argue below, this is largely due to low growth in the state income. The stagnancy in growth must be broken for the social development process to take off in Assam.

Fig 2.1: Comparision of Per Capita Income- Assam Vs. All-India

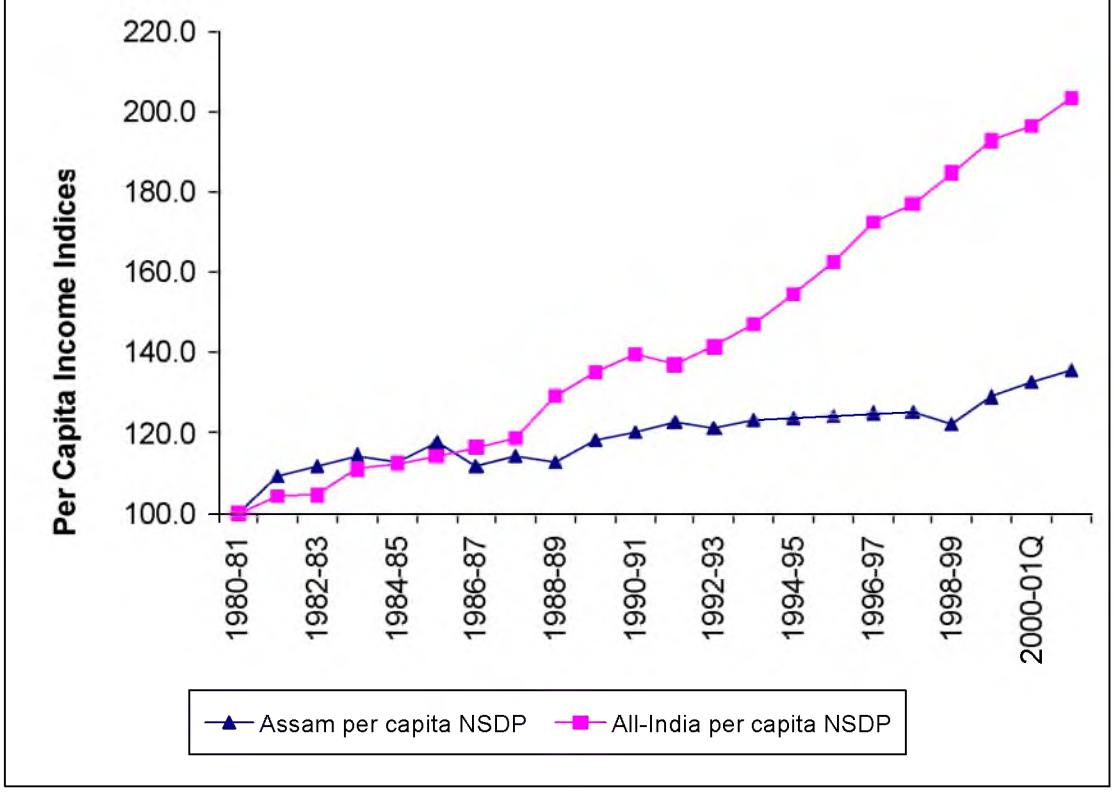

Table 2.1: Per Capita Real Income: Assam vs. All-India

Year	Income Level (Rs)		Income Indices	
	Assam	All-India	Assam	All-India
1980-81	1284	1625	100.0	100.0
1981-82	1402	1692	109.2	104.1
1982-83	1437	1699	111.9	104.6
1983-84	1470	1804	114.5	111.0
1984-85	1447	1827	112.7	112.4
1985-86	1510	1857	117.6	114.3
1986-87	1437	1893	111.9	116.5
1987-88	1468	1929	114.3	118.7
1988-89	1446	2099	112.6	129.2
1989-90	1517	2198	118.1	135.3
1990-91	1544	2267	120.2	139.5
1991-92	1575	2226	122.7	137.0
1992-93	1557	2298	121.3	141.4
1993-94	1583	2394	123.3	147.3
1994-95	1589	2512	123.8	154.6
1995-96	1595	2643	124.3	162.6
1996-97	1605	2804	125.0	172.6
1997-98	1605	2877	125.0	177.1
1998-99	1569	3003	122.2	184.8
1999-2000	1656	3134	129.0	192.9
2000-01Q	1705	3192	132.8	196.5
2001-02Adv	1745	3307	135.9	203.5

Note: Per capita net domestic product at 1980-81 prices. Figures for 1994-95 onwards are obtained by using annual growth rates from the new series with 1993-94 as base year.

Table 2.2: Growth in Real Gross State Domestic Product

				(Per cent per annum)
Period	Primary	Secondary	Tertiary	GSDP
1980-90	2.16	4.13	4.37	3.34
1991-2001	1.89	3.88	4.52	3.27
1980-2001	1.81	3.80	4.57	3.25

Note: Estimates of growth rate for the period 1980-2001 made by fitting equations of the type Ln(Y) = a+bT where Y is relevant income series and T is time trend.
For the sub-periods, growth rates are computed from equation Ln(Y) = a+bT +c D.T where D is a dummy variable with value 1 for 1991 onwards and 0 otherwise.

Table 2.3: Percentage of Population below Poverty Line (Official Estimates)

	Assam			All-India		
Years	**Rural**	**Urban**	**Total**	**Rural**	**Urban**	**Total**
1973-74	52.67	36.92	51.21	56.44	49.01	54.88
1993-94	45.01	7.73	40.86	37.27	32.36	35.97
1999-2000	40.04	7.47	36.09	27.09	23.62	26.1

Source: Economic Survey 2001-2002, Govt. of India

2.5 Sectoral Composition

7. Corresponding to the above growth rates, there has been a change in sectoral composition of GSDP. Table 2.4 shows the sectoral composition at current prices. As naturally expected in a growing economy, the contribution of the primary sector to the state GSDP has fallen from 47.5 per cent in 1980-81 to 40.7 per cent in 2001-02. The share of the secondary sector has increased by about 8 percentage points to 20.5 per cent in 2001-02 while the share of the tertiary sector has remained nearly the same. Since current price sectoral composition is affected by both relative growth rates across sectors as well as by relative price movements, it might be better to look at the changing composition in real terms.

8. Table 2.5 shows the sectoral composition in real terms at 1980-81 prices. This table shows that share of primary sector has fallen from 47.5 per cent in 1980-81 to 34.7 per cent in 2001-02 indicating a larger fall than those at current prices. The share of secondary sector has marginally risen from 12.6 per cent in 1980-81 to 14.7 per cent in 2001-02. The service sector considerably increased its share from 39.9 per cent in 1980-81 to 50.6 per cent in 2001-02. The rise in contribution of this sector is particularly evident since mid-1980s.

Table 2.4: Sectoral Composition of GSDP (At Current Prices)

	Primary	**Secondary**	**Tertiary**	**Total**
1980-81	47.5	12.6	39.9	100.0
1990-91	48.5	19.1	32.4	100.0
2000-01(QE)	40.7	19.7	39.6	100.0
2001-02(Adv.)	40.7	20.5	38.8	100.0

Source: Directorate of Economics and Statistics, Assam.

Table 2.5: Sectoral Composition of GSDP (at 1980-81 Prices)

Year	Primary	Secondary	Tertiary	GSDP	Primary	Secondary	Tertiary	GSDP
	Rs Lakh at 1980-81 prices				Percentage Distribution			
1980-81	119500	31742	100384	251626	47.5	12.6	39.9	100.0
1981-82	128306	36033	110041	274380	46.8	13.1	40.1	100.0
1982-83	137060	35459	115168	287687	47.6	12.3	40.0	100.0
1983-84	142655	37169	119315	299139	47.7	12.4	39.9	100.0
1984-85	135028	42813	124696	302537	44.6	14.2	41.2	100.0
1985-86	145344	41765	136004	323113	45.0	12.9	42.1	100.0
1986-87	140758	38521	136144	315423	44.6	12.2	43.2	100.0
1987-88	148468	44082	140880	333430	44.5	13.2	42.3	100.0
1988-89	147902	45651	143605	337158	43.9	13.5	42.6	100.0
1989-90	159336	47675	155030	362041	44.0	13.2	42.8	100.0
1990-91	158688	49640	168567	376895	42.1	13.2	44.7	100.0
1991-92	162528	49522	182170	394220	41.2	12.6	46.2	100.0
1992-93	163400	50745	185561	399706	40.9	12.7	46.4	100.0
1993-94	167616	52504	195978	416098	40.3	12.6	47.1	100.0
1994-95	171277	60300	193007	424584	40.3	14.2	45.5	100.0
1995-96	171992	57045	212592	441629	38.9	12.9	48.1	100.0
1996-97	170948	60756	224604	456308	37.5	13.3	49.2	100.0
1997-98	176984	61653	222714	461351	38.4	13.4	48.3	100.0
1998-99	171611	60669	233210	465491	36.9	13.0	50.1	100.0
1999-00	179611	72715	240959	493284	36.4	14.7	48.8	100.0
2000-01 (QE)	183828	73572	258159	515559	35.7	14.3	50.1	100.0
2001-02 (Adv.)	184141	77652	268145	529938	34.7	14.7	50.6	100.0

Note: Figures for 1994-95 onwards are obtained by using annual growth rates from the new series with 1993-94 as base year.

2.6 Effects of Growth and Distribution on Poverty

9. In this section, we use the data set created at the World Bank on mean consumption expenditure, Gini coefficient and head count ratio of poverty based on the National Sample Survey Organisation (NSSO) consumption expenditure data for various rounds and reported in Datt (1998). This data set, available for 1957-58 to 1993-94, has been created at comparable all-India rural and urban prices and could help us to examine the long-term effects of real income growth and its distribution on changes in poverty. This is attempted below. Before estimating this relationship, we make a few general observations on Assam's development process on the basis of the World Bank's data set.

10. While the overall income growth rate is slow, the Assamese society has been more egalitarian than most other Indian states. The Gini coefficient in consumption expenditure distribution has been only around 0.19 for rural areas and around 0.29 for urban areas of Assam in recent years. Among the major Indian states, Assam's income distribution is the most egalitarian in rural areas and the second best in urban areas on an average basis during 1990-94 (See Table 2.6).

11. Another noteworthy feature of the development process of Assam is the striking difference in relative position of rural and urban areas by per capita consumption expenditure. According to estimates made at the World Bank, Assam occupies the second highest level in mean consumption among the major states in urban areas on a comparable basis, but it is the second lowest in rural areas. This gets reflected in Datt's poverty estimates too. As Table 2.6 indicates, among the major Indian states, Assam's average head count ratio is the lowest during 1990-94 in urban areas (12 per cent) and the fourth highest in rural areas (49 per cent). The more egalitarian consumption expenditure distribution obviously helps the state to improve its ranking in poverty ratio compared to ranking in mean consumption.

12. However, more worrisome are the following trends in real consumption expenditure and poverty revealed by the NSSO data (See Table 2.7):

    - Per capita mean consumption expenditure in real terms has fallen at a trend rate of 0.37 per cent per year in rural Assam[2] over a long period of above 35 years spanning over 1957-94[3].

    - As a result, Assam is the only major state where rural poverty has not fallen during1957-94. In fact, the poverty measures – head count ratio as well as distribution sensitive measures such as squared poverty gap – showed an increasing trend, though not significant (Datt, 1998)[4].

    - This was so despite a falling trend in rural Gini coefficient during the above period. The benefits of reduced inequality on the poverty ratio have obviously been more than offset by the rapid fall in real mean consumption level in rural Assam.

13. To formally establish the relationship of poverty ratio with the mean income and distribution parameter, we have run a set of regression equations. Two types of data have been used: (i) time series data for rural and urban areas of Assam on head count ratio (HCR), mean consumption expenditure in real terms (MC) and the distribution parameter as given by the Gini coefficient (GINI) and (ii) cross section data across various states on trend annual growth rates on HCR, MC and GINI.

[2] Bihar is the only other state that showed a marginal fall of 0.03 per cent during the same period.
[3] In the post 1975 period, mean consumption in rural Assam grew marginally at 0.47 per cent (Datt and Mukherjee, 2000).
[4] As discussed earlier, the head count ratio in Assam dropped by 5 per cent during 1993-94 to 1999-2000.

Table 2.6: Poverty, Consumption and Distribution: Averages 1990-91 to 1993-94

	RURAL			URBAN		
	MC	**HCR**	**GINI**	**MC**	**HCR**	**GINI**
Andhra Pradesh	68.34	35.89	28.39	78.66	30.59	32.50
Assam	**52.63**	**49.33**	**19.27**	**97.75**	**11.95**	**28.94**
Bihar	48.60	63.20	22.36	67.22	42.39	31.72
Gujarat	59.27	41.77	24.07	68.27	37.33	29.52
Jammu & Kashmir	70.70	31.20	27.87	99.36	14.01	28.45
Karnataka	57.69	46.88	26.46	79.13	34.09	34.63
Kerala	73.32	33.01	30.67	89.53	30.62	37.16
Madhya Pradesh	60.56	49.79	30.53	71.80	38.17	33.76
Maharashtra	58.76	50.50	30.02	74.18	37.47	34.86
Orissa	66.32	34.66	26.29	75.06	43.31	37.83
Punjab & Haryana	83.27	20.64		93.41	13.63	
Rajasthan	60.02	45.79	27.98	75.90	29.50	29.61
Tamil Nadu	63.93	41.80	29.39	84.14	31.87	36.82
Uttar Pradesh	62.57	41.72	28.09	70.63	39.35	32.75
West Bengal	68.13	31.51	25.75	92.80	23.79	34.37

Source: G. Datt, Indian Journal of Labour Economics, 1998

Note: MC = Mean Consumption in Rs per month at 1973-74 prices

HCR = Head Count Ratio of Poverty, GINI = Gini Coefficient
More recent estimates of official head count ratio for the period 1973-74 to 1999-2000 have been reported earlier in Table 2.3.

Table 2.7: Trend Growth Rates in Poverty, Consumption and Distribution (1957-58 to 1993-94; per cent per annum)

	RURAL			URBAN		
	MC	**HCR**	**GINI**	**MC**	**HCR**	**GINI**
Andhra Pradesh	1.14	-2.12	-0.21	0.92	-1.50	0.17
Assam	**-0.37**	**0.46**	**-0.60**	**0.47**	**-1.63**	**0.18**
Bihar	-0.03	-0.02	-0.96	0.57	-0.86	-0.14
Gujarat	0.70	-1.49	-0.58	0.75	-1.28	-0.05
Jammu & Kashmir	0.34	-0.51	0.47	1.32	-3.40	0.18
Karnataka	0.18	-0.64	-0.56	0.91	-1.42	0.06
Kerala	1.63	-2.41	-0.21	1.67	-2.06	0.30
Madhya Pradesh	0.21	-0.40	-0.44	0.45	-0.87	-0.15
Maharashtra	0.82	-0.99	0.23	0.20	-0.46	-0.10
Orissa	0.67	-1.47	-0.35	0.84	-0.95	-0.09
Punjab & Haryana	0.41	-1.92		0.83	-3.06	
Rajasthan	0.16	-0.54	-0.52	0.65	-1.42	-0.16
Tamil Nadu	1.04	-1.45	-0.03	0.72	-1.10	-0.16
Uttar Pradesh	0.33	-0.70	-0.22	0.62	-1.11	-0.40
West Bengal	0.77	-1.74	-0.06	0.44	-0.56	0.25

Source: G. Datt, Indian J. of Lab. Econ., 1998

Note: MC = Mean Consumption (Real), HCR = Head Count Ratio, GINI = Gini Coefficient
Trends on head count ratio during 1973-74 to 1999-2000 have been reported in Table 2.3

The results are given below:

Time series data on Assam:

Rural: Ln (HCR)= 11.067 – 2.355 Ln (MC) + 0.728 Ln (GINI), R^2=0.96
(35.8) (20.1) (8.2)

Urban: Ln (HCR)= 12.436 – 3.197 Ln (MC) + 1.396 Ln (GINI), R^2=0.82
(6.6) (8.3) (5.1)

Cross-section data on trend growth rates G(.) across major States:

Rural: G (HCR)= -0.085 – 1.554 G (MC) + 0.255 G (GINI), R^2=0.927
(0.62) (10.48) (1.20)

Urban: G (HCR)= -0.297 – 1.377 G (MC) + 0.375 G (GINI), R^2=0.59
(0.84) (3.20) (0.46)

14. These equations do reveal strong relationship of poverty index with mean consumption expenditure and distribution parameter on time series data for Assam. The cross section data across states also reveals significant influence on poverty trend by mean consumption, though influence of distribution is not significant. The first equation set is obviously more relevant for our purpose. It indicates that the partial elasticity of HCR with respect to MC and GINI are –2.35 and 0.72 in rural Assam. This means that a 1 per cent rise in per capita real consumption expenditure reduces rural poverty ratio by as much as 2.35 per cent, while a 1 per cent rise in GINI coefficient increases rural poverty ratio by 0.72 per cent. Thus, given that rural Assam has witnessed a trend decline in MC by 0.37 per cent and in GINI by 0.60 per cent (Table 2.7), the overall effect on HCR was (-2.35) (–0.37) + (0.72) (–0.60) = 0.87 – 0.43 = 0.44 per cent per annum. This estimated change in HCR is very close to the observed trend increase of 0.46 per cent per annum, which implies that, estimated relation explains the observed changes fairly well. Note also that the final effect on HCR is dominated by the growth effect. Indeed, if the mean consumption fall in rural Assam could have been arrested or reversed (as in most other states), rural poverty in Assam would have shown a falling trend over the years rather than an increasing trend.

15. Similarly, if per capita consumption could grow at an additional rate of 3 per cent per annum in future, the poverty ratio HCR would fall by about 7 per cent per year assuming distribution parameter to remain constant. If this trend could be continued for five years, HCR would fall by 30 per cent of the initial level. For example, if 40 per cent of the population is below the poverty line initially, the level would go down to 28 per cent over

five years and to 19 per cent over 10 years with a 3 per cent growth in mean consumption per annum. This establishes the need for a higher growth rate in per capita income and consumption to reduce poverty.

2.7 Higher Income Growth Scenarios

16. What is the order of higher growth rate Assam should target for? An answer to this question would depend on several factors:
    1. What would be the desired growth rate for the Assamese economy?
    2. What is the likely growth rate in the medium run (say, five years)?
    3. What is growth potential in the long run (say, two decades)?

17. As discussed above, the normative consideration for a desired growth rate could be based on the poverty alleviation target so as to ensure a decent minimum income to the people. Thus, if incidence of absolute poverty should be reduced to about 10 per cent over the next two decades, the per capita consumption expenditure must grow by at least 3 per cent per year. The corresponding growth in per capita income would be larger than 3 per cent because of higher savings requirement to finance the growth. This translates to a GSDP growth rate of more than 5 per cent.

18. Another normative consideration is: can Assam pull its income up to the average national level? Such a reference is often made in policy circles in Assam for fixing a growth target for the medium or long run. In order to have an examination of the relative magnitudes, we have estimated the per capita income levels for Assam and all-India for about two decades under alternative assumptions about the future growth rates in Table 2.8. Several observations might be made in connection with the estimates in this table.

19. First, given that the economy of Assam has grown at a lower rate than the national average for several decades, it would be unrealistic to think of bridging the gap in the medium run of 5-10 years. Hence, we consider a more modest target of accelerating Assam's growth rate to 6 per cent from the current 3.5 per cent per annum in the medium run, that is, during the next five years. This would help the state to catch up to the national level in terms of its growth rate and arrest the present relative difference to diverge further. The percentage difference in per capita income of Assam and all-India remains at current level for five years in this situation. This growth scenario translates to a growth rate of about 4 per cent per annum in per capita terms. The corresponding per capita income estimates are about Rs 8000 for Assam and Rs 13000 for all-India at 1993-94 prices (see Panel A of Table 2.8).

20. Second, once the growth rate of Assam accelerates to the national average during the first five years, more ambitious targets could be fixed in a long-term perspective for the

following 15 years. Panel B of Table 2.8 shows the effects of a two-percentage points higher growth rate for Assam (6 per cent per capita) than the all-India rate (4 per cent per capita) during the period 2007-2022. The per capita income of Assam would then come closer to the national average and the current difference of about 40 per cent gets reduced to about 20 per cent in this scenario. The current difference is so large that a two-percentage points higher growth for 15 years can bridge the gap only by about half.

Table 2.8: Per Capita Income: Long-Term Scenarios

Year	Growth rates		Terminal year		Assam/
	Assam	All-India	Per Capita Income		All-India
			Assam	All-India	
Panel: A					
2001-02			6299	10623	0.593
2002 to 2007	4.0	4.0	7970	13441	0.593
Panel: B					
2002 to 2007	4.0	4.0	7970	13441	0.593
2007 to 2012	6.0	4.0	10666	16354	0.652
2012 to 2017	6.0	4.0	14273	19897	0.717
2017 to 2022	6.0	4.0	19101	24207	0.789
Panel: C					
2002 to 2007	4.0	4.0	7970	13441	0.593
2007 to 2012	6.0	4.0	10666	16354	0.652
2012 to 2017	7.0	4.0	14960	19897	0.752
2017 to 2022	7.0	4.0	20982	24207	0.867
2022 to 2027	7.0	4.0	29428	29452	0.999
Panel: D					
2002 to 2007	6.0	6.0	8935	15069	0.593
2007 to 2012	8.0	6.0	13129	20166	0.651
2012 to 2017	9.0	6.0	20200	26986	0.749
2017 to 2022	9.0	6.0	31081	36114	0.861
2022 to 2027	9.0	6.0	47821	48328	0.990

Note: Per capita income at 1993-94 prices (Rs)

Year 2001 represents financial year 2001-02 and so on.

21. Third, panel C indicates a scenario where Assam catches up with national level per capita income by 2027. Such an aspiration is reflected in the "Vision: Assam 2025" document prepared by a group of Ministers recently. This scenario involves high growth rates on a sustained basis for the next 25 years: same growth rate as the national level (4 per cent per capita) for first five years, two percentage points higher growth rate (6 per cent per capita) for next five years and three percentage points higher growth rates (7 per cent per capita) during the following 15 years.

22. Fourth, if the national economic growth rises to about 6 per cent per capita as is being suggested now as the target for the 10th Plan, then Assam too must attempt to grow at that

rate during the next five years to keep the relative disparity at the current level. Further, another 2-3 percentage point higher growth rates would be needed to catch up by 2027 (panel D of Table 2.8). A per capita growth rate of 8-9 per cent for about two decades, as panel D suggests, might look infeasible[5] and Assam would then have to reconcile with a longer time horizon to catch up with the national level.

2.8 Investment Need

23. We now ask the question: what would be the investment requirement if Assam were to accelerate its growth rate to 6 per cent per annum over the next five years? Capital being the constraining factor for growth in a labour abundant economy, the feasibility of medium-term growth would mostly depend on availability and efficient use of financial resources. We make an attempt to answer this question below.

24. The latest data available on GSDP refer to the year 2001-02 (advanced estimates) and it has been estimated to be Rs 34030 crore at current at 2001-02 prices. Corresponding to a 6 per cent compound annual growth rate, the GSDP in 2006-07 would be Rs 45540 crore. The incremental income turns out to be Rs 11510 crore during the five years 2002-06 at 2001-02 prices (See Table 2.9).

25. The sectoral composition of GSDP for 9 broad sectors is projected using the current trends and likely growth pattern. Projections of current trends in GSDP composition indicate that share of primary sectors would fall by about 2 percentage points to 38.7 per cent in 2006-07 from 40.7 per cent in 2001-02, share of service sector would rise to 40.5 per cent from 38.8 per cent and industry share would marginally rise to 20.8 per cent over this period.

26. Next, in order to estimate investment need of various sectors, we need an indication about likely values of incremental capital output ratios (ICOR). We started with the ICORs reported in 9th Five-Year Plan and calibrated them keeping in mind the intra-sectoral composition of Assam and projected efficiency gains for the 10th Plan. Applying the ICORs on incremental income, we get a total investment requirement[6] of about Rs42500 crore for the five-year period 2002-03 to 2006-07 (See Table 2.9). A few major points emerging from this table are:

    - Agricultural growth could not be neglected for achieving a higher overall growth. It needs to grow at about 4.8 per cent per annum corresponding to GSDP growth of 6 per cent. The investment requirement is relatively lower in agriculture

[5] Note that the GSDP growth rate would be at least 1.5 per cent higher because of population growth. There are very few instances of 9-10 per cent steady growth for an economy for two decades.

[6] We might note here that the investment requirements estimated here provide only an indicative pattern. It was not possible for us to estimate state level ICORs in the absence of sufficiently long time series data on investment for Assam.

because of lower capital-output ratio. About 13 per cent of investment needs to be allocated to agriculture as against its share of above 32 per cent in GSDP.

- Substantial proportions of investment are required in the infrastructure sectors like electricity, gas, transport and communication. The estimates indicate that about 17 per cent of total investments is needed in these sectors even though they account for only about 5 per cent of state income. Infrastructure sectors have high ICORs and long gestation lags. Unless adequate investments are made early enough, bottlenecks might arise for future growth prospects.

- The manufacturing sector, which accounts for about 13 per cent of GSDP might need about similar per cent of total investment. We discuss later priorities within the manufacturing sector based on inter-sectoral linkages and comparative advantage.

- Given the continuation of likely shift in GSDP in favour of service sectors, investment requirement in these sectors would be almost proportional to share in GSDP at about 40 per cent.

Table 2.9: Income and Investment Estimates during 2002-06

	GSDP 2001-02		GSDP 2006-07		Incremental Income	Growth Rate	ICOR	Investment Needed
	Level	%	Level	%				
Agriculture	11047	32.5	13965	30.7	2918	4.80	1.90	5545
Forestry & Logging	500	1.5	608	1.3	108	4.00	2.30	249
Fishing	584	1.7	782	1.7	198	6.00	2.20	435
Mining & Quarrying	1702	5.0	2278	5.0	576	6.00	5.90	3396
Manufacturing	4451	13.1	5845	12.8	1394	5.60	4.10	5715
Construction	2119	6.2	2972	6.5	853	7.00	2.70	2303
Electricity, Gas and Water Supply	430	1.3	632	1.4	202	8.00	14.30	2886
Transport, Storage & Communication	1284	3.8	1887	4.1	603	8.00	7.50	4520
Trade, Hotels and Restaurants	4132	12.1	5795	12.7	1663	7.00	4.80	7984
Real Estate, Ownership of Dwellings and Business Services	761	2.2	1067	2.3	306	7.00	4.80	1470
Finance &Public Administration	4201	12.3	5723	12.6	1522	6.38	2.39	3645
Other Services	2819	8.3	3987	8.8	1168	7.18	3.80	4439
GSDP	34030	100.0	45540	100.0	11510	6.00	3.70	42587

Note: All income and investment levels in Rs Crore at 2001-02 prices. Investment refers to gross capital formation by public and private sectors together.

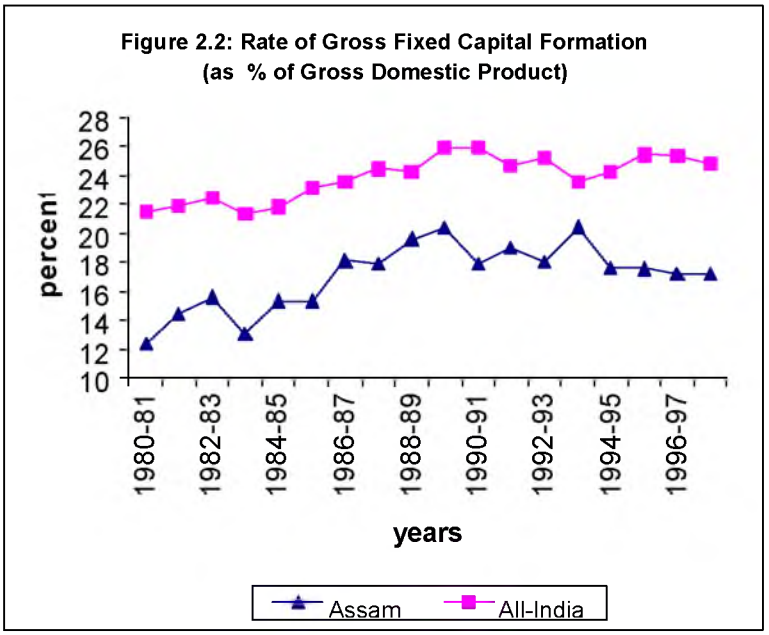

Table 2.10: Investment and Income Profile for 2000-2005

(By public and private sectors together; Rs Crore at 2001-02 prices)			
Year	Investment	GSDP	Investment/GSDP (%)
2001-02	6125	34030	18.0
2002-03	6923	36072	19.2
2003-04	7720	38236	20.2
2004-05	8517	40530	21.0
2005-06	9315	42962	21.7
2006-07	10112	45540	22.2
Total (2001-06)	42587	203340	20.9

27. The base investment data for 2000-01 are not available. Figure 2.2 indicates the investment rate of Assam and that of all-India for the period 1980-81 to 1997-98. One major reason for low-income growth in Assam is low rate of investment. The gross fixed capital formation (GFCF) rate was only 12.3 per cent for Assam in 1980-81 when the all-India rate was high at 21.4 per cent. The difference has narrowed down over time, but still Assam's GFCF rate for 1997-98 at 17.2 per cent is still way below the all-India rate by 7.5 percentage points. Unless this difference is further narrowed down, Assam's income growth cannot catch up with rest of India.

28. We assume an investment (GFCF) rate of 18 per cent of GSDP for Assam that is consistent with the current level of income growth and investment rate of 17.2 per cent in

1997-98. The absolute investment level then is estimated to be about Rs 6100 crore in the state. Under a linear growth path of investment over the five years 2002-06, we have an investment and income profile as in Table 2.10. The rate of investment need to grow by at least 4 percentage points to 22 per cent of GSDP during 2002-06 to realize the 6 per cent growth target.

29. The government has fixed the Annual Plan for 2002-03 at Rs 2770 crore[7]. This turns out to be about 40 per cent of the estimated investment for 2002-03. The public sector had a share of 34.5 per cent in total GFCF in 1997-98. The National Development Council has notified Assam as a Special Category State in the early 1990s. This notification had a major effect in the grant to loan component of Central assistance. It entitled Assam to receive Central assistance for State Plans with 90 per cent as grants and 10 per cent as loans (the grant-loan components used to be 30 per cent and 70 per cent earlier). Despite this provision, the state government finds it hard to raise resources for financing its 10 per cent share in plan outlay.

30. A report prepared by the National Institute of Public Finance and Policy (NIPFP) states that large dependence on Central funding leads to a fall in state's effort to raise its own resources and further increases dependence on Central fund (Srivastava, Chattopadhyay and Rangamannar, 1998). While very liberal Central funding cannot continue in the long run, we must also keep in mind immediate measures to tighten it would get reflected in reduced public investment and lower growth and further erosion of the tax base of the state. The appropriate sequence should be: downsize the government, reduce non-discretionary expenditure and increase state surplus for investment.

31. Assam would not be able to attract large-scale private investment till insurgency problem is solved. The urgent action for investment and growth also cannot be postponed for it would fuel the insurgency problem further. Hence, Central government should continue liberal support for investment for a few years. The share of public sector in total GFCF should be maintained between 35-40 per cent in Assam for at least five years. As insurgency problem is solved and the state becomes attractive for private investment, the Central government might reduce the plan grants in stages to the normal level.

2.9 Inter-sectoral Linkages

32. Another question that arises is whether we can identify some sectors where investments and consequent growth might have strong effects on other sectors to grow as well. In order to look at this question, we need to examine the backward and forward linkages of various sectors in the economy. The backward linkage of a sector measures the extent of inducement it has on the growth of other sectors that supply inputs to it. The forward

[7] See, "Draft Tenth Five year Plan and Annual Plan 2002-03", Government of Assam.

linkage, on the other hand, measures the extent of inducement a sector has on the growth of other sectors, which use inputs from it in their production process. The higher the total linkages of a sector, the more is the inducement on other sectors to grow. On this consideration, one might argue that sectors with high backward and forward linkages should get some priority in initial investment decisions.

33. What are the sectors in Assam that qualify for such considerations? A team of researchers from Gauhati University and Indian Statistical Institute has constructed an input-output table for Assam. On the basis of this table, the team identified the following sectors as having high backward (>1) and high forward (>1) linkages :

(a) Nonferrous Metal Products
(b) Other Metal Products
(c) Iron and Steel
(d) Other Wood Products
(e) Cotton Textiles
(f) Other Non-Electrical Equipments
(g) Paper and Paper Products
(h) Construction
(i) Electricity
(j) Petroleum Products
(k) Chemical Products

The list of sectors with high backward linkage (but low forward linkage) includes sectors such as leather products, fertilizers, cement, edible oil, sugar, jute, plywood and silk textiles. Some of the sectors that have high forward linkage (but low backward linkage) are crude and natural gas, animal husbandry, non-rail transport, forestry and agricultural produces.

34. Such a list provides guidelines for priorities in either direct provision of investment by the public sector or inducement to private sector's investment decisions. While inter-sectoral linkages are major considerations, it cannot be the exclusive basis regarding investment decisions in the economy. Other important factors to be considered are:

- Demand considerations: likely demand within the state as well as possible export demand outside the state.
- Comparative advantage: comparative advantage must ultimately guide the final decision for production within the state or imports.

Once the sectors are selected on these considerations, those having high backward and forward linkages should get priority while allocating scarce resources. This would help in deriving the maximum multiplier effects.

35. Assam's economy continues to depend heavily on agriculture. While a third of the SGDP originate from agriculture, a majority of the working population depends on this sector. As such, agriculture would continue to play a major role in the future growth process and

would call for a fairly good share of total investment as we have already noted. Since a separate chapter is devoted to agriculture in this report, we outline below a few points about prospects of non-agricultural sectors.

2.10 Industrial Diversification

36. Consistent with the state's natural resource base, industries like tea, petroleum refinery and plywood have occupied historically important positions in Assam. The tea industry dates back to mid-19th century and has played an important role in the economic and cultural life of upper Assam. Production, acreage and yield of tea have gone up over the years with large employment opportunities more favourable to rural areas and female employment. The petroleum refinery industry at Digboi is also about 100 years' old. Refineries have also been set up at other places like Guwahati, Bongaigaon and Numaligarh. Despite these industries, the industrialization process has not been wide spread in Assam. The contribution of manufacturing sector in the state's GDP remains low at about 10 per cent compared to all-India figure of about 19 per cent. Moreover, as the Industrial Policy Resolution of Assam Government points out future prospects for expansion of the large traditional industries is rather limited. Tea industry is believed to be approaching a saturation point. Petroleum sector might not be able to grow very much unless new oil fields are discovered. In the absence of a sustainable forest use plan, most units in the plywood industry have currently faced closure due to court intervention. Against this background, the need for diversification of the state's industrial base could not be overemphasized.

37. Other major manufacturing sectors in the state at present are cement, paper, petrochemicals, fertilizer and sugar. As pointed out in the chapter on Development Strategy, the scope for expansion of the new technology based information industry is no less in Assam than any other part of the country. In fact, Assam would have a relative advantage with the establishment of the new Indian Institute of Technology. The emphasis placed on information technology in the Draft Tenth Plan is in right direction. Another area where more attention needs to be devoted relates to agriculture and plantation based mass consumption products. These have high backward linkages as well as large employment effects. Development of industries based on locally available resources should naturally get priority. Assam also enjoys comparative advantage in tourism, handicraft and handloom sectors. In fact, handicraft and handloom markets could have a special tourists (and exports) focus in view of higher value addition.

2.11 Conclusion and Strategic Actions

38. In this chapter, we have reviewed the macroeconomic development process of Assam. Two major standard data sources in the country provide sufficient evidence to the fact

that Assam has not been able to keep pace with the national level on economic front. The National Accounts data income indicates that growth rate of state income has remained low for several decades and there is no evidence of acceleration in the post-reform period. The NSSO consumption expenditure data too shows that real mean consumption expenditure is falling in rural Assam. While income distribution in Assam has been more egalitarian compared to other states, it has not helped to reduce rural poverty in the state. Poverty reduction necessarily calls for higher economic growth in Assam.

39. A growth strategy for Assam to raise its per capita income to the national average by 2025 would require:

- A pick-up in state income growth to the national level in the medium run of about five years.
- A 2-3 percentage points higher growth rate than the national level thereafter for about two decades.

Admittedly, it is not an easy task. Yet, it is not an impossible task. Assam has got the required natural and human resources. Generation of required financial resources would involve the following:

- Steady pick up in investment rate in relation to state income by about 4 percentage points.
- Attraction of private investment in a big way. This in turn requires quick solution of the insurgency problem.
- Maintenance of the important role of the public sector in areas like irrigation, infrastructure and social sectors where private investment might not come forward.
- Priority should be given to those sectors that have both comparative advantage and high linkages with other sectors.

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3 Assam: Reorienting Fiscal Strategies Towards Economic Development

3.1 Introduction

1. Notwithstanding a decade of relatively rapid economic growth in India following the sweeping economic reforms initiated in 1991, the pace of growth in Assam has slowed down in recent years. It has among the poorest infrastructure and social indicators. Its infrastructure development index is only 79 in comparison to the base level of 100 for the country [NIPFP (1998)]. Despite its rich natural resources and environment, its per capita income is the third lowest among India's states (after Bihar and Orissa). In this respect, its position has also been worsening relative to states such as Kerala, Madhya Pradesh (MP) and Uttar Pradesh (UP) that were at similar levels five years ago but have now advanced to higher levels. There has been little progress at reducing poverty and Assam's population estimated to be below the poverty line was about 41 per cent in 1993-94 against the all-India average of 36 per cent. While poverty in Assam declined from 51 per cent in 1973-74, its relative ranking among 15 major states dropped from 6 to 12. Apart from Haryana, Assam is the only state where there was a drastic worsening of the rank [Agrawal and Srinivasan (2000)]. Together with large-scale migration, this has led to a large and rapidly rising unemployment.

2. Needless to say, a state's public finances play an important role in improving its development performance. But, while the government's development spending increased at the rate of 12 per cent in the 1990s, its spending on non-development grew at a much faster pace of 17 per cent (See Table 3.1). Within development, the share of spending on economic services shrunk over this period owing particularly to the decline within revenue expenditure (whose magnitude is three times more than capital expenditure). On the one hand, the growth in development spending has not kept pace with that in non-development spending and on the other most anti-poverty programmes suffer from considerable leakage and inefficiencies in their implementation. For example, in the running of the public distribution system for food security, Assam is the fourth lowest among 17 states in terms of reaching the subsidy to the bottom 20 per cent of households. At the same time, the leakage of rice and wheat from the system is as high as 69 per cent and 98 per cent respectively [Jha and Srinivasan (1998)].

3. In this Chapter, we analyze the performance in recent years of Assam state government and local governments with a view to finding ways of improving the state's development performance. The rest of the Chapter is organised as follows. In the next section we give a

brief overview of the continuing fiscal problems in the state and consider various options. In section 3, we analyze the situation of local government finances as the lack of adequate effort towards local decentralization has gained a prominent place in recent policy deliberations. In section 4, we present possible fiscal strategies for the state government to pursue in order to improve the development conditions in the state and summarise them in the form of an action plan in the last section.

Table 3.1: Annual Rate of Growth in State Finances of Assam (1990-91 to 2000-01)

Variable	Growth rate (per cent)
GSDP	**8**
Total Revenue Receipts	**11**
Own Revenue	**9**
Own Tax Revenue	12
Own Non-Tax Revenue	5
Central Transfers	**12**
Share in Central Taxes	13
Total Grants from Centre	12
State Plan Grants	12
Central Plan Grants	17
Centrally Sponsored Schemes	11
Non-Plan Grants	12
Total Expenditure	**14**
Development Expenditure	**12**
Social services	14
Economic services	11
Non-Development expenditure	**17**

Source: RBI Report on State Finances

Notes: 1. GSDP figures from 1997-98 are projected based on past trends. 2. The budget data for 1999-2000 relate to revised estimates and for 2000-01 to budget estimates.

3.2 The Fiscal Position of the State Government

4. As the first step in its response to the fiscal crisis, the Government of Assam (GoA) decided to inform the public of the magnitude of the problem. It issued a White Paper on the state's finances, pointing out specifically that it "had to resort to increased borrowings over the years to meet its current expenditure requirements which, if not drastically curbed, will lead the state irretrievably into a debt trap" [GoA (1999)]. This gives an insight that the Assam government is indeed aware of the need to take steps to set right its fiscal position. However, the White Paper stops short of making any recommendations whatsoever on the strategies that it should adopt to get over its fiscal problems. In the following, we analyze various

aspects of state fiscal policies and performance and suggest possible strategies to be followed.

3.3 Revenue and Expenditure

5. Analyzing data over a 15-year period beginning 1984-85, GoA (1999) recognises the "failure of revenue receipts to meet … rapidly growing expenditure commitments, particularly expenditure on salaries, wages, allowances and pensions". While the wage bill is rising due to both rising number of employees and higher wages, the state government has "never been able to meet" this expenditure from its own revenues, except in 1986-87. However, subsequently the fiscal reforms committee [GoA (2001)] set up by the government recommended "curb on fresh employment and reduction of total number of government employees @ 2 per cent per year over the next 5 years". It also recommended a freeze on dearness allowance for at least three years. The White Paper points out the heavy losses incurred from negligible returns from capital expenditure on projects and investments in public sector undertakings, declining buoyancy of state tax revenues, and the consequent rising costs of public debt and higher borrowings.

6. Increased spending on infrastructure, social sectors and maintenance will be required to improve the quality of services provided before such costs can be recovered through increased user charges. The reform framework should ensure that the proposed public investments are fiscally viable. They should also create an environment for implementation of the sector reforms focusing on programs in the education, health, irrigation, infrastructure and other sectors to crowd-in private investment. Such a statewide reform program would provide Assam with a unique opportunity to breakout from stagnation and move on to a rising growth path.

3.4 Dependence on the Centre

7. The increasing dependence of the state government on the Centre is reflected in the share of revenue generated from its own sources in its total revenue receipts declining from about 40 per cent at the beginning of the decade to just about 30 per cent at the end of it (See Table 3.2 and Figure 3.1). This is a result of a lower annual growth rate of 12.5 per cent in the state's own revenue receipts than that of Central revenue transfers 16.4 per cent [GoA (1999)]. In addition, the composition of Central transfers shows a decline in the share of state plan transfers and shared taxes; to be covered up mainly by Centrally sponsored schemes and non-plan grants. Furthermore, as regards borrowings, market loans by the government have risen at the rate of 18.1 per cent and state provident funds at 15.41 per cent against the rate of growth of Central

loans at 6.31 per cent.[1] Table 3.3 presents the accumulated arrears of revenue that has not been collected partly due to pending court cases.

Table 3.2: Percentage share of Revenue Receipts in GSDP

Tax Revenue	Non-Tax Revenue	Share in Central Taxes	State Plan Grants	Central Plan Grants	Centrally Sponsored Schemes	Non-Plan Grants	NEC/ Special Plan Scheme	Total Grants from Centre	Observed	NIPFP projections (with state level reforms)
3.96	2.61	4.59	2.33	0.08	1.07	2.08	0.000	5.57	16.73	
4.32	2.22	4.48	6.12	0.24	0.99	2.04	0.000	9.39	20.41	
3.97	3.53	4.52	5.68	0.42	0.65	1.27	0.003	8.01	20.03	
4.16	2.37	5.28	8.54	0.07	0.90	1.11	0.098	10.72	22.54	
3.83	1.98	4.97	4.46	0.33	1.69	0.61	0.065	7.16	17.94	
3.99	1.91	5.19	4.78	0.29	0.77	2.24	0.001	8.09	19.17	
4.03	1.69	6.18	5.37	0.17	0.70	2.02	0.106	8.37	20.27	
4.30	1.86	7.19	5.31	0.13	0.58	1.67	0.053	7.74	21.09	18.75
4.48	2.06	6.15	5.45	0.09	0.83	1.40	0.089	7.85	20.54	21.93
5.71	1.98	6.96	6.36	0.59	1.28	1.72	0.378	10.33	24.98	21.74
5.74	1.91	5.97	6.27	0.56	2.03	3.41	0.533	12.79	26.41	22.64

Report on State Finances, various issues and NIPFP (1998)
igures from 1997-98 are projected based on past trends.

Table 3.3: Outstanding arrears of state government tax revenue (Rs Lakh)

Tax	Arrears as on March 31, 1997	Tax revenue in 1997-98
Sales tax	16010	50766
Land revenue (including taxes on commercial crops)	2271	6089
Agricultural income tax	3486	8431
Electricity duties	2040	186
Motor vehicles/ Passenger and Road tax	881	6568
Taxes on profession, trades, calling, employment etc.	105	14172
Others	169	1982
Total arrears	24962	88194

Data Source: Government of Assam (1999)

[1] Central loans comprise 10 per cent plan assistance, 75 per cent of net small savings raised in the state, special WMA to be paid within the year and loans for central schemes. Market borrowings include loans raised through issue of SLR based Assam Bonds as per the allocations made by the Planning Commission. The RBI on behalf of the state government raises the latter's market borrowings. Money raised under the State Provident Fund imposes an additional liability, as it is a loan that will have to be repaid to subscribers with interest.

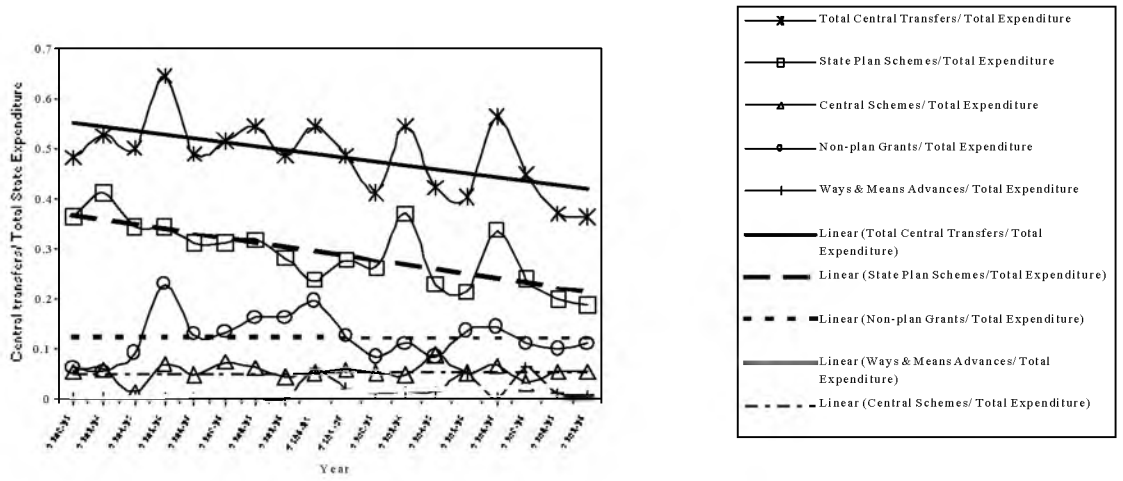


Figure 3.1: Contribution of Central transfers to State Government Expenditure

3.5 Deficits

8. Assam is currently facing a fiscal crisis of unprecedented proportions. It is caught in a vicious circle where low growth keeps both living standards down and reduces revenue yields. There are growing concerns about rising revenue deficit in the state, mainly due to a deterioration of its budgetary position and the persistence of poverty (See Figure 3.2). Frequent law and order problems over the past decade have led to a rapid deterioration in the quality of governance. Poor governance and high growth in the government's wage bill have led to high and growing deficits (See Tables 3.4 and 3.5). For instance, the revenue surplus of 1.41 per cent of GSDP in 1996-97 declined to 0.41 per cent in 1998-99. The revised and budgeted figures for 1999-00 and 2000-01 show a further and steep decline in this surplus (converting it into deficit) to –5.84 per cent and –3.63 per cent respectively. The corresponding fiscal deficit is of the order of about 10 per cent and 8 per cent respectively. It is interesting to note that under two alternative reform scenarios, one with reforms by the state government and the other including a major role by the centre as well, NIPFP (1998) had projected the fiscal deficit of the state to decline to less than 3 per cent by 2000-01.[2]

[2] This deficit reduction was obtained despite the rise in expenditure to accommodate the 5th Pay Commission's awards. The main recommendations of NIPFP (1998) pertaining to Assam's state finances in relation to its other economic and non-economic problems are based on counterfactual simulations and include alternative profiles for a 5-year adjustment period beginning 1997-98. Among other things, they recommend targeting capital expenditure to

Among other things, their first scenario assumed annual reduction in government employment of 1 per cent while for the second it was 2 per cent accompanied by payment of arrears of petroleum royalty and insurgency related expenditure by the Centre. Obviously, there has been a slowdown in the past few years in implementing the suggested reforms.

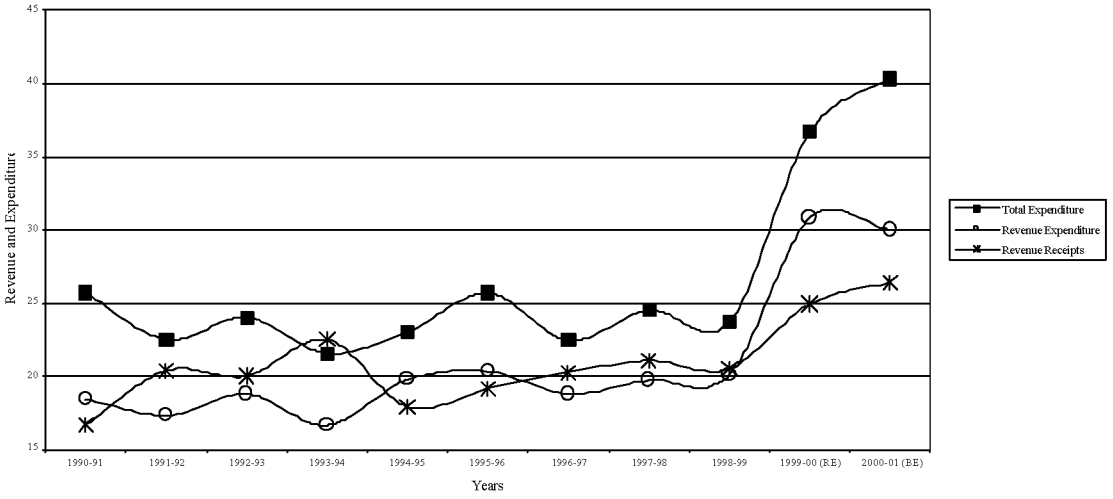


Figure 3.2: Deficits of the State Government (per cent of GSDP)

Table 3.4A: Percentage share of Expenditure in GSDP

Years	Development Expenditure			Non-Development Expenditure			Other Revenue Expenditure	Other Capital Expenditure				Total Expenditure
	Revenue Expenditure	Capital Expenditure	Total	Revenue Expenditure	Capital Outlay	Total	Compensation and Assignment to local bodies	Discharge of internal debt	Repayment of central loans	Loans and Advances by State	Total	
1990-91	12.40	2.28	14.68	5.61	0.05	5.66	0.46	0.01	3.18	1.72	4.91	25.70
1991-92	13.54	2.35	15.89	3.73	0.06	3.78	0.07	0.07	0.65	2.07	2.78	22.53
1992-93	12.10	1.76	13.86	6.63	0.06	6.69	0.05	0.12	2.24	1.07	3.44	24.04
1993-94	12.60	1.66	14.26	4.01	0.05	4.06	0.06	0.12	2.02	1.04	3.18	21.56
1994-95	12.43	1.62	14.05	7.35	0.06	7.41	0.04	0.01	0.79	0.78	1.58	23.07
1995-96	13.31	2.10	15.42	6.93	0.05	6.98	0.11	0.01	2.13	1.05	3.20	25.71
1996-97	11.84	1.25	13.08	6.92	0.03	6.95	0.06	0.09	1.64	0.65	2.38	22.48
1997-98	12.09	1.58	13.67	7.60	0.03	7.63	0.05	0.13	2.53	0.53	3.19	24.54
1998-99	12.82	1.64	14.46	7.26	0.02	7.28	0.05	0.17	1.41	0.35	1.93	23.72
1999-00 (RE)	19.02	2.88	21.90	11.75	0.08	11.83	0.05	0.18	1.60	1.13	2.92	36.71
2000-01 (BE)	19.58	7.29	26.86	10.42	0.07	10.48	0.05	0.19	1.48	1.28	2.95	40.35

Source: RBI Report on State Finances, various issues
Note: GSDP figures from 1997-98 are projected based on past trends.

government departments and allocated to priority sectors of irrigation, health, education, infrastructure and modernization and computerization of general administration.

Table 3.4B: Composition of Expenditure (Percentage of GSDP)

Years	Revenue Expenditure	Capital Expenditure	Total Expenditure	
			Observed	NIPFP projections (with state level reforms)
1990-91	18.46	7.24	25.70	
1991-92	17.34	5.19	22.53	
1992-93	18.78	5.25	24.04	
1993-94	16.68	4.88	21.56	
1994-95	19.81	3.26	23.07	
1995-96	20.36	5.34	25.71	
1996-97	18.82	3.66	22.48	
1997-98	19.75	4.80	24.54	26.25
1998-99	20.13	3.59	23.72	31.69
1999-00 (RE)	30.82	5.89	36.71	30.61
2000-01 (BE)	30.04	10.31	40.35	28.04

Sources: RBI Report on State Finances, various issues and NIPFP (1998)
Notes:
1. GSDP figures from 1997-98 are projected based on past trends.
2. The NIPFP trends incorporate increased salaries due to the 5th Pay Commission recommendations but with a downsizing of staff

Table 3.5: Fiscal deficit as a percentage of GSDP

Composition of fiscal deficit				
Year	Fiscal deficit	Revenue deficit	Capital outlay	Net lending
1998-99	1.54	-0.41	1.66	0.29
1999-00 (RE)	9.90	5.84	2.97	1.09
2000-01 (BE)	8.31	3.63	7.35	-2.68
Financing of fiscal deficit				
Year	Fiscal deficit	Net central loans	Net market borrowings	Others
1998-99	1.54	0.64	1.62	-0.72
1999-00 (RE)	9.90	1.12	1.44	7.33
2000-01 (BE)	8.31	0.89	1.39	6.03

Source: RBI (2000)
Note: '-' indicates surplus

3.6 Borrowings, Guarantees and Debt

9. Persisting fiscal deficits are one of the most significant weaknesses of the state economy, with public sector borrowing crowding out private sector borrowing and increasing macroeconomic risks. Among other things, the declining contribution of Central transfers to total state spending in the last decade has led the state to rely increasingly more on borrowing of various kinds including market borrowing at rising interest rates. The "debt servicing costs account for as much as 95 per cent of fresh debt contracted" and the repayment of principal and interest on Central loans exceed the receipts [GoA (1999)].

10. In addition to borrowings, government guarantees are growing and being used extensively in mobilising funds for capital expenditure (Table 3.6). The high levels of guarantees may not imply immediate obligation but could lead to a large burden on state finances in future. State guarantees have the potential of worsening an already poor fiscal system through the hidden fiscal risk of contingent liabilities associated with such guarantees in a situation of default.[3] In cases when guarantees are invoked, the state government would be liable to pay both the principal and the interest due. Indeed, most of the government guaranteed loans have been subject to default according to GoA (1999).

Table 3.6: Guarantees (contingent liabilities) given by Assam State Government (Rs Lakh)

Year	New guarantees	Outstanding guarantees	
		Total	% given to ASEB
1991-92		102796	80
1992-93	11921	109399	76
1993-94	12462	122984	68
1994-95	32482	138382	64
1995-96	14214	124986	53
1996-97	500	114939	56
1997-98	850	143000	63
1998-99 (RE)		143000	66

Sources: RBI (1999) and Government of Assam (1999)
Note: ASEB refers to Assam State Electricity Board.

[3] Article 293(1) of the Constitution of the India allows state governments to give guarantees within limits as fixed by the legislature of the concerned state. Unlike for raising loans, states do not require prior consent of the Government of India before giving a guarantee and this is irrespective of whether or not they are indebted to the Government of India.

11. The fiscal crisis along with diversion and inefficient utilization of funds does not allow the state to invest for strengthening the foundations for economic growth and improving social achievement. This has resulted in an unsustainable level of indebtedness. The combined burden of interest bearing public debt and guarantees together as a ratio of NSDP currently stands at 43 per cent. Trends in public debt should be seen with caution as the reported debt has been lower than the actual debt by a factor of about 20-30 per cent due to exclusion of contingent liabilities on account of guarantees issued by the government. For example, in 1998-99 the government's actual outstanding aggregate liability was 37 per cent of GSDP against the conventional estimate of only 31 per cent (See Table 3.7).

Table 3.7A: Outstanding Debt Position of Assam State Government (Rs Lakh)

Year	Central loans	GPF	Market loans	Other Financial institutions	WMA from RBI	Guarantees (contingent liability)	Total	
							Excluding guarantees	Including guarantees
1990-91	363518	18636	22751	4205	21834		430944	
1991-92	378875	22169	26521	4009	24874	102796	456448	559244
1992-93	373536	25722	38686	4602		109399	442546	551945
1993-94	335775	29141	49860	4213	1728	122984	420717	543701
1994-95	355022	33166	66011	5034	2082	138382	461315	599697
1995-96	386380	37926	82269	5497	20839	124986	532911	657897
1996-97	399784	43557	100158	3594	24059	114939	571152	686091
1997-98	415162	50818	120199	2450	19758	143000	608387	751387
1998-99	421960	68180	155699	8153	19758	143000	673750	816750
1999-00 (RE)	455370	135080	191899	21327	19758		823434	
2000-01 (BE)	477450	184580	228099	NA	NA			

Table 3.7B: Outstanding Debt Position of Assam State Government (per cent of GSDP)

Year	Central loans	GPF	Market loans	Other Financial institutions	WMA from RBI	Guarantees (contingent liability)	Total	
							Excluding guarantees	Including guarantees
1990-91	34	1.75	2.14	0.40	2.06		41	
1991-92	32	1.87	2.24	0.34	2.10	8.68	39	47
1992-93	29	1.97	2.96	0.35	0.00	8.38	34	42
1993-94	23	1.98	3.39	0.29	0.12	8.36	29	37
1994-95	22	2.01	4.00	0.30	0.13	8.38	28	36
1995-96	22	2.15	4.67	0.31	1.18	7.10	30	37
1996-97	21	2.29	5.27	0.19	1.27	6.04	30	36
1997-98	20	2.48	5.86	0.12	0.96	6.97	30	37
1998-99	19	3.11	7.10	0.37	0.90	6.52	31	37
1999-00 (RE)	19	5.78	8.21	0.91	0.85		35	
2000-01 (BE)	19	7.44	9.19					

Sources: Government of Assam (1999) and RBI Bulletin on state finances, various issues.

Note: Loans from "other financial institutions" include those from LIC, NABARD and NCDC.

3.7 Shortage of Liquidity and Ways and Means Advances

12. A government can spend only to the extent that it has the cash to pay for. But often due to delays in receiving payments in time, they run into short run liquidity problems. To tide over such mismatches between their receipts and expenditure state governments maintain certain interest-free balances with the RBI.[4] In turn, the RBI provides them reasonable amount of temporary advances to tide over their liquidity problems through Ways and Means Advances (WMA) and Overdrafts. The record of the North-Eastern states, particularly of Assam, in their dealings with the RBI in this arrangement is worrisome. For example, during 1997-98, of the 16 states that resorted to overdrafts, in three states – Assam, Manipur and Mizoram – payments were stopped, as they could not clear their overdrafts with the RBI within the stipulated time limit of 10 consecutive working days. The problem was particularly severe in Assam where payments were stopped as many as eight times. A similar situation continued during the following year. In the first seven months (April-October) of 1998-99, 16 state governments were again in overdrafts. Of these, in four States – Assam, Manipur, Mizoram and Nagaland – payments were once again withheld, as they could not clear their overdrafts within the specified period.

3.8 Public Sector Enterprises

13. Assam has 49 state Public Sector Enterprises (PSEs). Of these, the Assam State Electricity Board (ASEB) and the Assam State Transport Corporation (ASTC) alone account for more than 90 per cent of the total state government investment in the PSEs, which was of the order of Rs 2243 crore in 1996-97. But such investments have yielded very poor returns to the state government due to over-staffing, large overhead costs, low capacity utilisation, and financial mismanagement making most of the PSEs unviable. In addition ASEB also suffers from frequent breakdowns, high "transmission and distribution losses" and the cost of production in thermal, gas based and hydel-power plants exceed tariff. Interestingly, ASEB accounts for the lion's share of guarantees given by the state government while the arrears of electricity duty to be collected have surpassed more than 1000 per cent of actual tax collected (See Tables 3.3 and 3.6). Due to accumulated losses and high liabilities on account of power purchase, fuel supplies and rising debt obligations the net worth of the Board has become negative. It was less than –Rs 880 crore in 1998-99. While the average tariff charged by ASEB in that year was Rs 2.62/ Kwh, its net loss per unit of sale was much higher at Rs 3.15/

[4] Under section 21A of the RBI Act, 1934, a state can entrust to it its banking business by voluntarily entering into an agreement to undertake general banking business in India, including payments, receipts, collection, remittance of money, management of public debt and issue of new loans. 23 states have made such agreements.

Kwh.[5] Clearly, imposition of appropriate user charges should be high on the agenda of reform. According to GoA (1998), a high-level committee set up is likely to recommend further investment to restructure the Board and strengthen and improve its distribution network and this will increase the net outflow from ASEB.

14. The ASTC is the only statewide public transport service covering remote rural and hilly areas with poor road conditions, uneconomic load factors and lack of private operators. Moreover, it also runs buses for school children, aged people and the public sector. These add up to a high cost and with low tariffs the operation of ASTC is uneconomical making it increasingly more dependent on budgetary support from the state government. The immediate solutions seem to be to invest in better roads and to reduce ASTC's services in areas that are served well by private transport operators.

15. Among the rest of the PSEs in the state, most were created for implementation of socio-economic programmes for weaker sections again with very low returns. Many of these are not operational and the government is trying to revive them through joint private partnerships and leases. Once again, the solution seems to be to charge appropriate fees/ charges for the services provided while at the same time improving the efficiency of operation of these enterprises.

3.9 Local Decentralization and Governance Issues

16. An important aspect of the fiscal situation in a state is the position of its local governments. Local decentralization has both political and economic rationales. It leads to increased political responsiveness and participation at the local level, higher allocative efficiency of public spending reflecting local needs, higher competitiveness of local governments leading to better innovation and increased willingness to pay for local services. It is also expected to achieve higher economic efficiency, better accountability, larger resource mobilisation, lower cost of service provision and higher satisfaction of local preferences. Moreover, at the macroeconomic level, quality of governance could be greatly enhanced by greater fiscal decentralization. These improvements can be brought about through local fiscal autonomy, which stands for the right and capacity of local governments to collect, decide upon and spend their own revenues. But for such achievements local bodies require, among other things, substantial administrative capacity, significant discretion over financial resources and willing bureaucrats.

[5] Report on the Financial Performance of ASEB, prepared by Planning and development Department, Government of Assam.

17. Among the seven sisters, most of which were carved out of Greater Assam – and include Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, the state of Assam pioneered the introduction of Panchayat Raj System and conducted regular elections till 1992. However, since then there has been no election despite the 73rd and 74th Constitutional Amendment Acts to strengthen local decentralization. At present there are three distinct systems of local government in Assam.

    - Plain areas with 21 districts having Panchayati Raj System

    - Hilly and tribal districts under two Autonomous District Councils: Karbi-Anglong and North Cachar Hills with elected councils at district level but no village government

    - Areas inhabited by Bodo and other tribals under different autonomous councils representing different ethnic groups

18. The local governments in this state are not developed well particularly in rural areas. For example, as opposed to 2500 people that are served by a rural panchayat on average among all the states in the country, in Assam the corresponding number is more than 7000. While the numbers served by urban municipalities is lower for this state at 3100 against the all-state average of 5600, the urban share of its population is too small to make a difference. Despite the Amendments to the Constitution, the local governments are very poor in contrast with the situation in other states. Tables 3.8 and 3.9 show that rural governments in Assam are much poorer than their urban counterparts and compared to other states, both urban and rural local governments in Assam play a relatively insignificant role in the provision of local services. The rural governments in Assam spend on average just about Rs 17 per capita per annum as against the average for all-states, which is close to Rs 300. Even in urban areas the per capita spending made by local bodies in Assam is less than Rs 200 per annum against the average figure for all-states of almost Rs 7000 (Figure 3.3). A substantial portion of local government spending in this state is on non-developmental items including staff salaries and other administrative expenses. The expenditure on core services is less than 40 per cent of the total by urban governments and less than 30 per cent by rural governments.

19. While the existence of panchayats in terms of resources generated is negligible in Assam, its municipal bodies also generate a meagre amount of about Rs 130 per capita per annum. In contrast, municipal bodies in the other states generate as much Rs 560. The state government carries out most of the spending in the state as seen from Figure 3.4. This reflects to a great extent the lack of decentralization in the state. The weak local governments that lack adequate powers, functions and resources have resulted in a poor pace of development and adversely affected the process of poverty alleviation. In the absence of proper governments at the local levels, this situation is compounded by the fact that programmes for rural development are planned and implemented by state officials and instead of catering to the

poor they benefit more the undeserving classes. Increasing poverty, division between tribals and non-tribals and diversion of public funds has encouraged corruption and also the youth to join the cadres of insurgency thereby adding to the law and order problem. Moreover, some development funds of the state government are also apparently being used to support these groups [Thapliyal (2001)]. One of the ways out of such a situation would be to increase people's participation in the process of governance through regular elections to local bodies and their strengthening by means of implementation of the 73rd and 74th Amendments in true spirit. The first and foremost requirement therefore is to establish well-functioning rural and urban local governments through regular and fair elections.

Table 3.8: Composition of local government finances: 1997-98

Region		Urban areas		Rural areas	
Area		Assam	All-States	Assam	All-States
Total Revenue (Rs lakh)		3960	1217879	1550	1935554
Total Expenditure (Rs Lakh)		5338	15130843	4057	2093116
Total Population in lakhs	(Rural share of 1991)	30.26	2171.66	242.36	7270.35
Per capita Total Revenue (Rs)		130.86	560.80	6.40	266.23
Per capita Expenditure (Rs)		176.41	6967.39	16.74	287.90
Revenue Composition	Own Revenue	60	69	22	3
	Tax	21	51	22	2
	Non-Tax	39	18	0	2
	Other Revenue	40	31	78	97
	Total Revenue	100	100	100	100
Expenditure Composition	Expenditure on core services	38	67	27	7
	Other Expenditure	62	33	73	93
	Total Expenditure	100	100	100	100

Source: Author's calculations

Data Source: Report of the Eleventh Finance Commission

Notes:

1. For rural areas, all-States refer to 23 States - Andhra Pradesh, Assam, Bihar, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.
2. For urban areas, all-States refer to 23 States - Andhra Pradesh, Assam, Bihar, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.
3. Core services comprise water supply, street lighting, sanitation and roads.

Table 3.9A: Per capita revenue generated in local areas from own sources by local and state governments net of shared taxes and transfer of grants (Rs per annum)

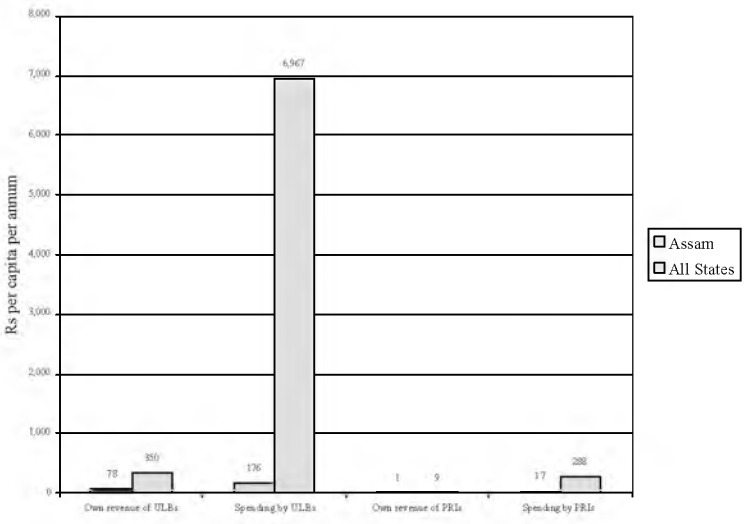
Level of Government	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
I. Assam State Government	296	322	397	382	373	396	407	463
II. Assam's urban local bodies	47	49	52	65	63	72	86	78
Nagar Panchayats	7	7	9	9	10	10	9	9
Municipalities	16	16	18	18	21	21	17	17
Municipal Corporations	24	26	24	37	32	41	59	52
III. Assam's rural governments	1.438	1.434	1.432	1.429	1.427	1.426	1.426	1.428
Gram Panchayats (Village level)	0.977	0.974	0.972	0.970	0.969	0.968	0.968	0.969
Panchayat Samitis (Block/ *taluk* level)	0.461	0.460	0.460	0.459	0.458	0.458	0.458	0.459
Zilla Parishads (District level)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Assam: Per capita urban revenue (I+II)	**343**	**371**	**449**	**447**	**436**	**468**	**493**	**541**
Assam: Per capita rural revenue (I+III)	**298**	**323**	**399**	**384**	**374**	**397**	**408**	**465**
IV. All State Governments	473	568	607	701	859	946	1047	1119
V. All states' urban local bodies	142	162	180	214	272	304	355	350
V'. All states' urban local bodies (excluding Maharashtra)	76	86	93	114	158	172	199	221
Nagar Panchayats	6	7	7	8	10	12	13	15
Municipalities	35	41	43	55	61	73	82	89
Municipal Corporations	101	114	130	150	201	219	260	246
Municipal Corporations (excluding Maharashtra with Mumbai)	35	39	43	50	87	88	104	117
VI. All states' rural governments	5.75	5.35	5.49	6.25	6.89	7.67	8.68	9.31
Gram Panchayats (Village level)	4.90	4.44	4.46	5.08	5.65	6.36	7.25	7.82
Panchayat Samitis (Block/ *taluk* level)	0.27	0.28	0.31	0.35	0.37	0.43	0.45	0.47
Zilla Parishads (District level)	0.58	0.63	0.72	0.83	0.88	0.88	0.98	1.02
All states: Per capita urban revenue (IV+V)	**616**	**730**	**787**	**915**	**1131**	**1250**	**1402**	**1469**
All states: Per capita urban revenue (IV+V') (excluding Maharashtra)	**550**	**655**	**700**	**815**	**1017**	**1118**	**1246**	**1340**
All states: Per capita rural revenue (IV+VI)	**479**	**574**	**613**	**707**	**866**	**954**	**1056**	**1128**

Table 3.9B: Per capita spending in local areas by local and state governments net of shared taxes and transfer of grants (Rs per annum)

Level of Government	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
I. Assam State Government	1122	1143	1272	1435	1553	1666	1590	1842
II. Assam's urban local bodies	99	108	108	115	129	128	157	176
Nagar Panchayats	18	18	18	20	24	25	32	34
Municipalities	20	21	24	29	36	36	51	52
Municipal Corporations	62	68	66	66	70	66	74	90
III. Assam's rural governments	1.02	3.86	16	16	17	17	19	17
Gram Panchayats (Village level)	0	1.36	12.14	12.11	13.32	13.15	14.03	12.05
Panchayat Samitis (Block/ *taluk* level)	1.02	2.24	2.65	2.93	3.22	3.37	3.60	3.65
Zilla Parishads (District level)	0.00	0.26	0.77	0.84	0.92	0.95	1.03	1.04
Assam: Per capita urban spending (I+II)	**1221**	**1251**	**1380**	**1550**	**1682**	**1794**	**1747**	**2019**
Assam: Per capita rural spending (I+III)	**1123**	**1147**	**1287**	**1451**	**1570**	**1683**	**1609**	**1859**
IV. All State Governments	1080	1254	1360	1509	1779	1920	2224	3922
V. All states' urban local bodies	1269	1237	1255	1753	1972	2236	3810	6967
V'. All states' urban local bodies (excluding Maharashtra)	904	1120	1115	1583	1747	1874	2619	2986
Nagar Panchayats	12	14	15	17	19	25	33	39
Municipalities	317	353	365	431	384	518	612	916
Municipal Corporations	940	871	874	1306	1569	1692	3165	6012
Municipal Corporations (excluding Maharashtra with Mumbai)	575	754	734	1136	1344	1331	1974	2031
VI. All states' rural governments	111	126	145	171	187	206	248	288
Gram Panchayats (Village level)	31	34	42	54	55	59	67	74
Panchayat Samitis (Block/ *taluk* level)	35	38	42	50	60	61	73	83
Zilla Parishads (District level)	45	54	60	67	72	86	108	131
All states: Per capita urban spending (IV+V)	**2349**	**2491**	**2614**	**3262**	**3751**	**4156**	**6034**	**10889**
All states: Per capita urban spending (IV+V') (excluding Maharashtra)	**1984**	**2374**	**2474**	**3092**	**3526**	**3794**	**4843**	**6908**
All states: Per capita rural spending (IV+VI)	**1191**	**1380**	**1504**	**1680**	**1966**	**2126**	**2472**	**4210**

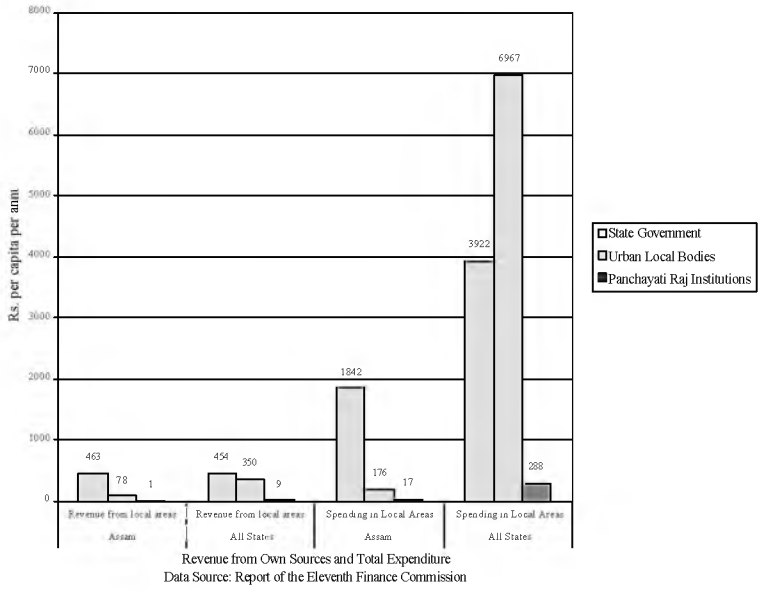
Source: Author's calculations

Data Source: Report of the Eleventh Finance Commission



ULBs: Urban Local Bodies PRIs: Panchayati Raj Institutions
Data Source: Report of the Eleventh Finance Commission

Figure 3.3: Per Capita Own Revenue and Total Spending of Local Bodies – Assam and All-States: 1997-98



Revenue from Own Sources and Total Expenditure
Data Source: Report of the Eleventh Finance Commission

Figure 3.4: Revenue and Expenditure Decentralization: Shares of State and Local Governments – Assam and All-states: 1997-98

20. The administrative machinery and tax collection capacity of local governments would have to be improved through institutional development in addition to passing more tax powers to them. The buoyancy of local taxes could be improved by imposing taxes on an ad valorem basis, correcting for under-valuation of property, introducing price differentiation between commercial and residential property, and cutting out exemptions. The state government should fix only the minimum rates – leaving the actual rate fixation to local governments to promote tax competition, higher revenue generation and better service provision. New taxes such as on cable television could also be envisaged for improving local revenues.

21. To improve the availability of trained staff the state could either transfer its own staff or make new recruitment from within local areas. The appointments could be made on temporary/ short-term contract basis to keep the service costs low and avoid legal complications. It is to be noted in this context that due to increase in service cost, the state government has been planning to downsize the strength of its employees by not filling up posts, which have fallen vacant due to retirement and the like. However, the target for staff strength could be maintained even with new contractual appointments by downsizing to a greater extent appropriately. As an additional measure, the workload of staff that are laid off could be reallocated to other regular workers as some officers and staff have been found to have insufficient workload. As yet another measure, some of the work on accounts and establishment may be computerized and work carried out by technically competent staff to allow for further downsizing. The government could also cancel illegal appointments of teachers.

22. There would also be a continuing need to develop training infrastructure and train the technical staff, for example, the accounts staff to be trained in panchayat/ municipal finance, accounts and budgeting. Apart from induction courses, they would need refresher courses at regular intervals. Another key to successful decentralization is to train local staff so as to make them more supportive of the community action programs. These steps aimed particularly at the educated youth would also help solve the insurgency problem, at least to a certain extent.

3.10 Fiscal Strategies for the Future

23. An immediate consequence of the state's fiscal crisis is a decline both in the quantity as well as the quality of public outlays in physical and social infrastructure. Such problems can be addressed by drastically reorienting the state's economic policy framework to restore trust in its public institutions and improve its fiscal capacity to invest in basic infrastructure and social services. The state now needs to initiate a set of fiscal, governance and public enterprise reforms to restore fiscal sustainability, improve governance, and also accelerate economic growth through reforms in the key sectors of the economy to bring about greater technical and financial efficiency. A comprehensive set of fiscal reforms would include:

3.10.1 Public Expenditure Management

24. There is a need for the Assam government to reorient its spending priorities towards growth and development enhancing activities such as capital expenditure/ rural infrastructure and employment programs particularly targeted at the youth to control the problems of insurgency. The safety net programmes of the government can be designed so as to create employment opportunities for uneducated youth. Since most poor live in rural areas, increasing employment in agriculture through higher investment in irrigation and other infrastructure, for example, roads and electricity can induce growth in the state. Also, higher irrigation through better productivity will help to raise real agricultural wages. Given the complementarity between public and private agricultural investment, maintaining a certain minimum level of public investment can crowd in more private investment in agriculture thereby improving the farming conditions, raising growth and reducing poverty. The government can also earmark funds to promote employment of educated youth for qualified jobs in schools, public offices and so on by appropriate downsizing elsewhere. For instance, it can examine the feasibility of curbing the rise in staff cost by transferring some staff from the state government to rural and urban locations to keep its staff size at a prudent level. Any new employment of staff can be on contractual and temporary basis. The government must also work towards rationalising subsidies and restricting guarantees to projects that have good credit rating and are financially viable.

3.10.2 Tax Policy

25. The revenue collections in the state – both at the state and local levels – leave much to be desired. The situation at the state level can be improved by strengthening the administrative machinery for tax collection and by imparting technical training with possible help from the Centre. A focus is also needed on high-yielding and more buoyant sources of tax revenue such as land revenue, tax on vehicles/ passengers and goods, and state sales tax. In the current practice of collection of land revenue through the *Mouzadars* the government is loosing a large amount in the form of commission offered to these agents. Instead, the revenue officials in the circle offices may be entrusted with collection of land revenue. The government also loses substantial land revenue due to illegal occupation of government land and it would be worth initiating steps to evict them. Moreover, a sizeable proportion of cultivable and homestead land in rural areas are under Annual *Patta*. If these lands were brought under periodic *Patta*, the government would earn land revenue at enhanced rate. GoA (2001) specifies several measures to strengthen tax collection from different sources.

26. At the local level, the administrative machinery and tax collection capacity of governments would require institutional development along with more tax powers. The buoyancy of local taxes could be improved by levying taxes on an ad valorem basis, correcting for under-

valuation of property, introducing price differentiation between commercial and residential property, and cutting out exemptions.

3.10.3 Public Sector Enterprises

27. The investments in Assam's State Public Sector Enterprises (PSEs) have yielded very poor returns to the state government due to poor organisation making most of the PSEs unviable. Two large enterprises, ASEB and ASTC, that have accounted for the major share of total state government investment in PSEs, are plagued with problems of high costs and low tariffs and the Jain Committee has recommended a comprehensive package for ASTC. Increasing user charges and improving efficiency of operations of the PSEs is inevitable. User charges are potentially an important source of revenue and should be levied and collected vigorously for all public services whether provided by the state or the local governments. Such measures would generate resources for investments, encourage private investment in these sectors, reduce consumer costs and improve quality of services by promoting competition.

28. Privatizing public sector enterprises would help reduce both the government's role in not-so-relevant sectors and the dependence on special purpose vehicles for its borrowing requirements that allow a state to incur commitments but defer actual expenditures by, for example, accumulating payables to contractors in response to a budgetary crunch. Such mechanisms make the state budget constraint soft. Fiscal deficit in the state is increasing the borrowing requirements on the one hand and pre-empting a high proportion of borrowed funds into current consumption on the other. In line with the thinking in some other states, the government of Assam could also pursue the option of a fiscal responsibility act to impose an overall limit on borrowings or debt accumulation.

3.10.4 Accountability

29. One of the important ways for the state government to proceed with reforms would be to make its fiscal operations transparent to the public. This would require full disclosure of all relevant fiscal information on its fiscal policy intentions, public sector accounts and projections in a timely and systematic manner. Its accountability can be increased by regularly (quarterly/ half-yearly) publishing reports on its receipts and expenditure including contingent liabilities and deviations from budgeted estimates with explanation for the latter. Transparency in fiscal policy can improve the quality of decision-making through greater scrutiny of government decisions and also facilitate a congenial atmosphere for investment and growth.

3.10.5 Decentralization to Local Bodies

30. In the light of the 73rd and 74th Constitutional Amendment Acts to promote local governments, the state should work towards establishing well functioning rural and urban local governments through regular and fair elections. This will have to be supplemented by providing them fiscal autonomy to collect, decide upon and spend their own revenues. Programmes for local development will also have to be planned and implemented by local governments with people's participation in the process of governance. Pasting monthly/ quarterly reports on receipts and expenditure of the local government outside their offices can increase the accountability of local governments and help to monitor the progress made through their development programmes. Strengthening local governments by giving them adequate powers, functions and resources is an important key to improve the pace of development and the process of poverty alleviation.

3.10.6 Role of the Central Government

31. Per capita growth in Assam will continue to stagnate in the absence of wide-ranging fiscal and structural reforms. The suggested fiscal correction would however require counterpart funding from Central government/ donors (at least in the initial phase of reform), which would have to be done with appropriate monitoring and evaluation. The release of funds could be linked to actual improvements in social and economic indicators as reflected in incomes, poverty, mortality, quality of services, provision of basic infrastructure through spending on priority sectors particularly covering backward areas and the lagging classes of people. The devolution and transfer of funds from the Centre would have to be linked more firmly with improvement in fiscal performance, for example, tax collection relative to tax capacity, imposition of user charges, rationalisation of subsidies etc. The Central government may also need to give a special phased grant to repay part of the state liabilities with strict monitoring of its use and promotion of transparency in its fiscal operations.

32. With the proposed reforms the state can improve the quality of its public services, raise the growth rate of its per capita income, stabilise its public debt and work towards reducing its debt-service ratio to focus greater attention on developmental issues.

3.11 A Summary of Action Plan

33. Initiate fiscal, governance and public enterprise reforms to restore fiscal sustainability, improve governance and accelerate economic growth.

    a. Reorient spending priorities

    - Capital expenditure – rural infrastructure

        ° Irrigation

- Roads
- Electricity

- Employment
  - safety net programmes targeted at rural areas and uneducated youth
  - of educated youth in schools, public offices etc. by appropriate downsizing elsewhere

- Any new government employment on contractual basis along with downsizing of regular staff

- Staff transfer from state to rural and urban locations

- Rationalisation of subsidies

- Restriction of guarantees to viable projects with good credit rating

b. Improve tax revenue generation

- Strengthen administrative machinery for tax collection at state and local level

- Impart technical training with help from the Centre

- Focus on high-yielding/ buoyant taxes

- Levy taxes on ad valorem basis (on value, not quantity)

- Introduce price differentiation

- Cut out exemptions

c. Improve non-tax revenue generation

- Increase user charges appropriately at state and local level

- Improve efficiency of operation of public enterprises

- Privatize enterprises in sectors not very relevant for the government

d. Impose limit on total borrowings/ debt accumulation

e. Make fiscal operations transparent to the public

- Full disclosure of policy intentions

- Report on receipts/ expenditure and contingent liabilities

f. Establish well functioning local governments in urban and rural areas with

- Adequate powers, functions and resources
- Fiscal autonomy to decide upon, collect and spend their revenues
- Planning and implementation of development programmes

f. Central government to provide
- Initial counterpart funds for reform, with monitoring and evaluation
- Special phased grant to repay part of state liabilities
- Transfer of funds linked to fiscal performance

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4 Poverty, Health and Education in Assam: Achievements and Challenges

4.1. Introduction

1. The main objective of this chapter is to examine the progress made so far by Assam on the human development front and the challenges it faces in the coming years and to identify areas of action. We analyze the trends in several social indicators including poverty and provide possible explanations for the same. Then we identify the target groups for public intervention aimed at poverty reduction and suggest appropriate policy measures for each of these groups. We also look at Assam's performance in relation to other States and examine if any lessons can be learnt from other States. Once we identify who and where the poor are we need to examine the causes and identify the structural and institutional impediments for faster growth and poverty reduction. The ultimate objective is to arrive at a human development strategy consisting of macroeconomic, structural and social policies among others.

4.2. Poverty in Assam

2. The historical trend in the incidence of rural poverty in Assam (between 1957-58 to 1993-94) shows an increasing trend as opposed to a secular decline in all other States.[1] This does not come as a surprise considering the slow growth of Gross State Domestic product (GSDP) in Assam as compared to the growth in the all India GDP. Unfavourable initial conditions (for example, only 4 per cent of the operated area was irrigated around 1960) has been an important reason for the poor performance of Assam in terms of poverty reduction. The growth rate of GSDP in Assam has been declining in recent years. Trends in real wages also show negative growth rates compared to positive growths in most other States and at the all India level (Table 4.1, Figure 4.1). Unemployment rate among the youth is also observed to have risen during the last two decades (Table 4.2). Since 1973-74, however, the incidence of poverty in Assam showed a declining trend (Table 4.3). Urban poverty declined in a smooth and remarkable way, whereas rural poverty has some ups and downs. For example between 1987-88 and 1993-94 rural poverty increased by 5 percentage points while urban poverty declined by 2 percentage points. However, since the population has been growing at an

[1] See Datt and Ravallion, 1996, Why have some Indian States done better than others at reducing rural poverty? Economica; 65(257), February 1998, pages 17-38.

alarming rate the absolute number of the poor (rural-urban combined) is on the rise (Figure 4.2).[2] Inter decadal growth rate in population in Assam between 1981 and 1991 was 24.24 per cent compared to 23.86 per cent at the all India level. The recent consumption expenditure survey results show that rural poverty declined between 1993-94 and 1999-2000 and the overall absolute number of the poor declined marginally during this period (Table 4.3). Provisional totals of the 2001 census indicate that inter decadal growth rate in population in Assam between 1991 and 2001 was lower compared to the previous decade. It was 18.85 per cent compared to 21.34 per cent at the all India level.

Table 4.1: Annual percentage change in real wages for unskilled agricultural labour

	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	CAGR
Andhra Pradesh	-11.43	1.61	8.6	2.71	-1.73	1.51	4.33	-3.46	4.13	1.92
Assam	-8.84	0.75	-6.58	-1.67	2.68	1.52	0.77	1.18	-1.02	-0.12
Bihar	-4.46	-4.67	-5.98	1.69	-2.3	15.15	-4.7	-5.7	-3.26	-0.45
Gujarat	-4.28	7.72	2.86	1.27	2.92	5.08	14.43	7.37	10.14	5.81
Karnataka	-13.02	-14.37	41.31	-15.6	-8.61	21.39	17.05	-2.83	8.42	4.75
Kerala	4.11	9.74	-2.84	5.24	13.2	14.54	15.67	4.9	-14.53	7.07
Madhya Pradesh	-3.94	12.31	-3.53	4.93	1.24	1.31	0.83	0.79	3.74	1.96
Maharashtra	-14.74	0.47	25.58	-0.68	-7.89	8.31	8.78	-5.41	-10.84	2.39
Orissa	-3.45	10.71	-0.14	-3.52	0.55	-0.41	2.39	0.61	-0.23	0.56
Punjab	3.76	4.11	1.51	-1.17	-6.5	-0.42	0.56	-2.92	-0.74	-1.23
Rajasthan	5.96	-3.64	-7.66	1.05	10.33	17.81	5.12	-16.26	16.83	3.06
Tamil Nadu	-5.08	13.37	11.6	1.03	3.63	7.9	13.39	2.63	16.84	7.34
Uttar Pradesh	1.35	7.56	-6.77	-2.31	14.78	-6.39	17.36	0.38	-5.61	2.57
West Bengal	-6.19	24.31	-6.5	-5.29	-0.28	11.15	3.02	-3.14	0.65	1.68
All India	-6.15	5.24	5.61	-0.39	0.72	6.37	7.17	1.56	1.15	3.36

Source: Economic Survey, various issues.
Note: CAGR indicates the compounded annual growth rate.

[2] The annual population growth rate over the decades starting from the 1951 to 1991 census for Assam is 2.56 compared to 2.14 for all India.

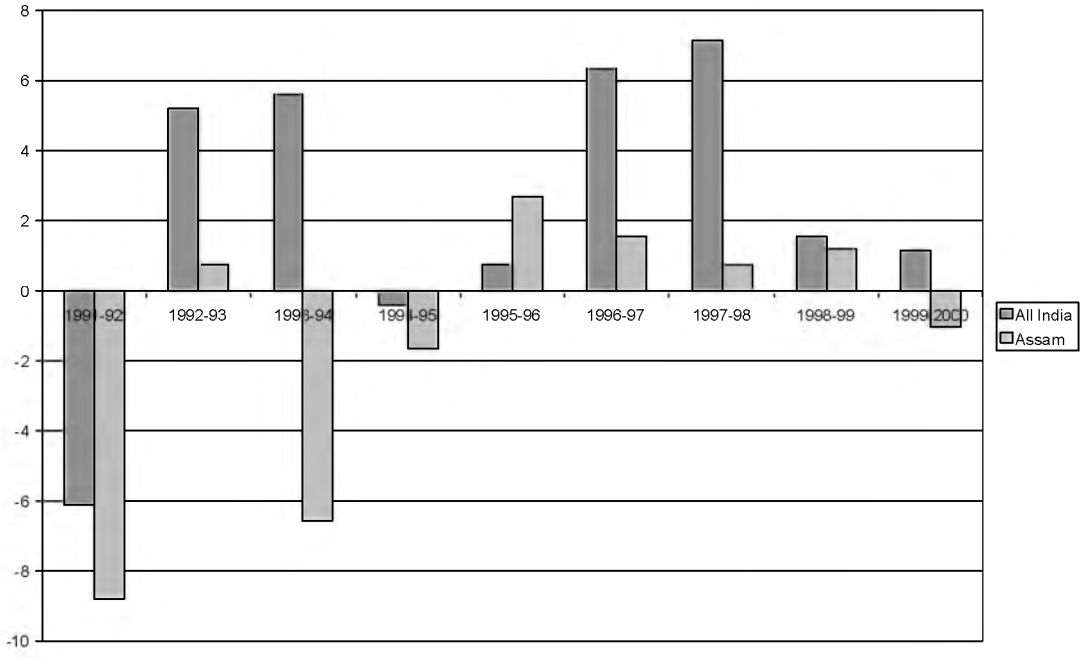

Figure 4.1: Annual percentage change in real wages for unskilled agricultural labour

Table 4.2: Unemployment rate among youth (age 15 – 29)

	1983-84	1993-94
Andhra Pradesh	2.49	3.45
Assam	**3.01**	**19.25**
Bihar	2.75	7.36
Gujarat	2.15	4.10
Haryana	3.31	6.20
Karnataka	2.60	4.99
Kerala	13.49	25.62
Madhya Pradesh	0.91	4.39
Maharashtra	2.79	6.55
Orissa	2.48	7.37
Punjab	4.23	5.32
Rajasthan	1.27	1.75
Tamil Nadu	5.88	8.03
Uttar Pradesh	1.96	3.79
West Bengal	5.66	11.45
All-India	3.31	6.46

Source: Aggarwal and Goyal (2000) The Indian Journal of Labour Economic\s, Vol. 43, No. 4

Table 4.3: Number of poor in Assam (per cent of total and in lakhs)

Years	Rural head count ratio	Urban head count ratio	Combined head count ratio	Rural poor (lakhs)	Urban poor (lakhs)	Total poor (lakhs)
1973-74	52.67	37.16	51.23	76.37	5.50	81.87
1977-78	59.82	37.58	57.63	97.55	6.70	104.25
1983	42.60	26.38	40.86	81.28	6.06	87.35
1987-88	39.35	9.94	36.21	73.53	2.22	75.75
1993-94	45.01	7.73	40.86	94.33	2.03	96.36
1999-2000 (30 day recall)	40.04	7.47	36.09	92.17	2.38	94.55
1999-2000 (7 day recall)	34.00	6.29	30.64	78.27	2.0	80.27

Source: http://www.indiastat.com (Planning Commission estimates based on Expert Group methodology)

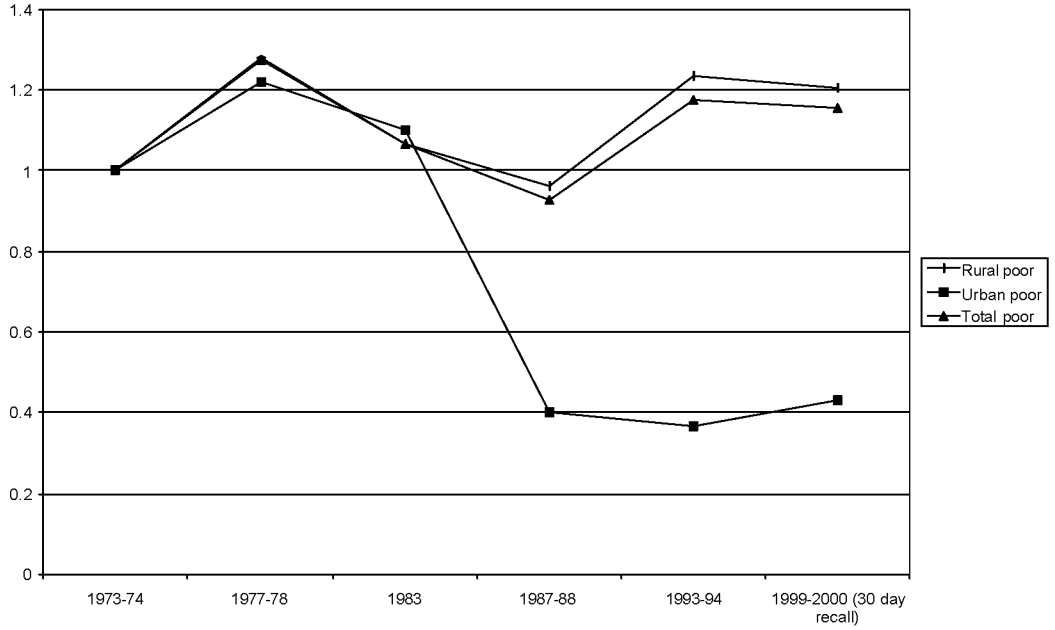

Figure 4.2: Absolute number of poor (1973-74 = 1)

4.2.1. Rural-Urban contrasts

3. Incidence of poverty in rural Assam is similar to that at the all-India level whereas poverty in urban Assam is much lower than that observed for urban areas at the all-India level. The trend in recent years shows that there has been a worsening of rural poverty even though there has been a decline in urban poverty in Assam. Concentration of poverty in urban areas is much lower than in rural areas (less than 50 per cent). Along with these trends if we consider the fact that bulk (almost 90 per cent) of the population lives in rural areas we could

say that poverty in Assam is predominantly a rural phenomenon. The key to poverty reduction therefore lies in the growth of the rural economy. Agricultural yields in Assam are low due to lack of modernization of agriculture. Policy initiatives are therefore needed to modernize agriculture and develop non-farm employment opportunities simultaneously. The poor transport, storage, communication and marketing facilities imply that there is substantial potential for encouraging rural non-farm employment. As will be seen below, the least poor group in rural Assam is the group that is self-employed in non-agriculture.

4. For policy purposes it is not enough to know the number of poor. It is important to know who the poor are and what their various characteristics are. A detailed profile of poverty in Assam depicting the extent to which people from different geographic locations, occupation, education and social backgrounds are afflicted by poverty would be required. This information is important to target the poor through appropriate programs and make the best out of limited resources.

4.2.2. Regional dimensions of poverty

5. Poverty estimates at sub-regional levels have become available for the two time periods 1987-88 and 1993-94. The National Sample Survey Organization based on agro-climatic homogeneity has grouped the districts/ tehsils in the country into several regions termed as the NSS regions. Assam has been divided into three regions, western, eastern plains and hills. Their poverty estimates suggest that western plains are the poorest parts of Assam (Table 4.4, Figure 4.3). The hill regions and the eastern plains have somewhat similar levels of poverty. In the hill regions however, rural poverty doubled between 1987-88 and 1993-94. It needs to be explored as to what caused such a big change. At the sub-regional or the district level we find a wide variation in the incidence of rural poverty (Table 4.4a, Figure 4.3a). These are estimates obtained from an estimated relationship between the incidence of poverty and variables such as urbanization and child mortality, the most significant determinants of poverty. It is found that the least urbanized districts are the poorest. Districts with low health status as indicated by under-five mortality also turn out to be poor. A wide variation is found even in the levels of access to basic health, education and other infrastructure facilities across the districts (Tables 4.4b – 4.4f and Figures 4.3b and 4.3c).

4.2.3. Social and economic dimensions of poverty

6. In rural areas, the incidence of poverty is the highest among agricultural and other labour (as high as 76 per cent and 80 per cent respectively), followed by self-employed in agriculture and self-employed in non-agriculture in that order (Table 4.5). Among the social groups incidence of poverty is higher among the scheduled castes as compared to that among scheduled tribes.

Table 4.4: Regional distribution of poverty in Assam

	Percent of population below poverty line					
	Rural		Urban		Combined	
	1987-88	1993-94	1987-88	1993-94	1987-88	1993-94
Plains - Eastern	32.25	40.09	9.14	8.23	33.15	36.70
Plains - Western	43.28	53.02	22.71	18.20	41.55	49.53
Hills	26.68	45.05	11.04	4.73	25.96	41.72
All-Assam	39.75	48.00	17.56	13.95	37.95	44.53
All-India	39.54	33.35	40.32	33.84	39.72	33.47

Source: Dubey and Gangopadhyay (1998)

Notes:

The poverty estimates correspond to the Expert Group Official Poverty lines (EOPL). EOPL for rural India: Rs 115.43 and Rs 196.83 respectively for 1987-88 and 1993-94 and for urban India Rs 165.58 and Rs 286.06 respectively for the years 87-88 and 93-94.

EOPL for rural Assam: Rs 127.44 and Rs 238.21 respectively for the years 87-88 and 93-94 and for urban Assam Rs 140.45 and Rs 241.43 respectively for the years 87-88 and 93-94.

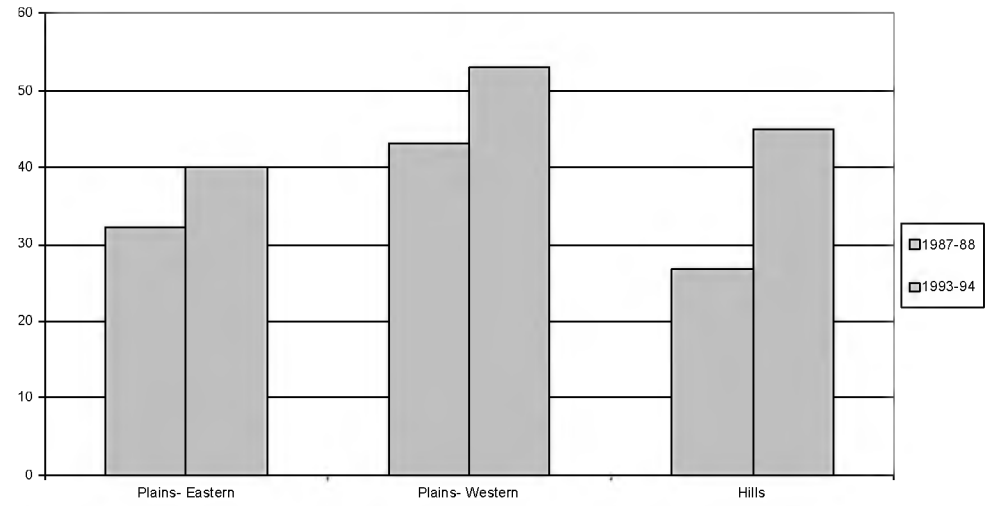

Figure 4.3: Rural poverty in Assam: Regional dimensions

7. Between the years 1987-88 and 1993-94, rural poverty increased across all the socio-economic groups. The highest increase occurred in the occupation group 'other labour' followed by the group 'self-employed in agriculture'. Although the overall urban poverty

head count decreased between these years it increased among the group of households categorized as employed with regular wages and salaries. The lower level of poverty in upper compared to lower Assam is mainly due to higher urbanization. Also two big industries- Petroleum and Tea are concentrated in upper Assam. In upper Assam, poverty is also linked to the flooding of Brahmaputra, which in one sweep can push families into poverty overnight. The frequent floods cause erosion and displacement. The displaced people lack the skills and resources that are required to survive outside their closed, self-sufficient communities.

Table 4.4a: District wise population and rural poverty estimates

District	Rural poverty (per cent below poverty line)	Rural poverty (Number of poor)	Total population	Per cent urban population	Per cent SC population	Per cent ST population	Per cent Muslim population
Dhubri	28.66	335450	1332475	12.16	4.82	2.42	70.45
Kokrajhar	75.92	569322	800659	6.34	3.76	41.15	19.33
Bongaigaon	57.46	421546	807523	9.15	10.74	17.53	32.74
Goalpara	60.34	371708	668138	7.8	5.5	17.23	50.18
Barpeta	50.19	646641	1385659	7.02	6.54	7.97	56.07
Nalbari	85.29	846854	1016390	2.31	8.78	17.67	19.94
Kamrup	24.52	329757	2000071	32.76	7.54	10.72	23.38
Darrang	64.12	791771	1298860	4.93	4.95	17.32	31.98
Sonitpur	36.8	485876	1424287	7.3	5.69	10.71	13.33
Lakhimpur	57.05	400701	751517	6.54	8.01	23.57	14.51
Dhemaji	69.53	326738	478830	1.86	6.37	43.92	1.49
marigaon	80.14	486189	639682	5.16	13.78	15.4	45.31
Nagaon	38.96	657405	1893171	10.87	10.02	3.69	47.19
Golaghat	33.55	261434	828096	5.9	5.59	10.25	7.11
Jorhat	22.75	167934	871206	15.27	7.61	12.09	4.32
Sibsagar	20.33	171247	907983	7.23	3.56	3.8	7.63
Dibrugarh	16.34	140341	1042457	17.61	4.02	7.95	4.49
Tinsukia	11.45	89160	962298	19.08	2.61	5.35	3.13
Karbi Anglong	36.85	218254	662723	10.63	4.22	51.56	1.57
North Cachar	33.01	38395	150801	22.87	2.6	65.54	2.21
Karimganj	48.23	369773	827063	7.3	14.58	0.17	49.17
Kailakandi	43.79	181694	449048	7.6	12.05	0.16	54.79
Cachar	41.04	449862	1215385	9.81	14.7	1.36	34.49

Source: Census of India, 1991, for population data and author's estimates for poverty head count ratio.

Notes: District-wise poverty estimates are obtained as follows. Since poverty estimates are available at the level of NSS regions (for example, Dubey and Gangopadhyay, 1998) we obtain through regression a relationship between regional poverty and its most significant determinants percentages of urban, SC/ST and muslim population, information on which is available from the census. The district level census data is aggregated to the level of NSS region for running the regression. The fitted relationship is used to obtain rough estimates of poverty in the districts. Although the prediction errors are likely to be very high this method gives a fairly accurate poverty ranking of the districts.

The poverty estimates are based on the survey data for the year 1993-94 and the poverty line used Rs 223.19 per capita consumption expenditure per month (referred to as alternative poverty line ("APL") in Dubey and Gangopadhyay, 1998).

Table 4.4b: District-wise Percentage of Inhabited Villages Having Different Types of Medical Institutions (1991) Part-I

Districts	Any Medical Facility (%)	Primary Health Sub-centre(%)	Primary Health Centre(%)	Health Centre (%)	Dispensary (%)	Hospital (%)	Nursing Home (%)	Maternity & Child Welfare Centre (%)
Assam	14.13	4.12	2.5	1.60	1.61	2.95	0	0.82
Barpeta	19.41	17.55	2.87	1.43	4.02	1.63	0	1.82
Bongaigaon	10.26	2.68	2.8	1.52	2.21	1.83	0	0.35
Cachar	17.19	2.25	3.91	1.37	2.93	6.63	0	0.59
Darrang	13.40	5.35	1.66	2.03	1.05	3.99	0	0.60
Dhemaji	6.58	2.25	1.80	0.18	0.18	0.27	0	0
Dhubri	12.54	4.83	1.01	0.62	1.64	1.56	0	0.55
Dibrugarh	20.98	6.20	4.67	1.91	0.84	6.97	0	0.54
Goalpara	20	5.37	1.07	0.13	1.21	4.03	0.13	0
Golaghat	14.07	2.93	5.19	3.21	0.19	2.46	0	0.16
Hailakandi	22.02	2.45	5.20	5.20	2.45	5.50	0	0.31
Jorhat	16.54	6.39	3.01	0.75	0.75	4.39	0	0.88
Kamrup	18.23	6.06	2.38	2.85	3.15	2.08	0	0.54
Karbi Anglong	3.33	0.36	0.44	0	0.87	0.16	0	1.63
Karimganj	20.49	4.59	1.68	0.22	2.35	4.70	0	0.11
Kokrajhar	8.13	1.19	2.06	1.84	2.38	1.63	0	0.22
Lakhimpur	10.70	4.65	1.93	0.88	0.18	1.40	0	1.14
Marigaon	15.82	4.57	3.51	3.16	3.16	3.16	0	0.35
Nagaon	18.18	7.05	2.55	2.11	2.11	2.69	0.07	0.73
Nalbari	21.30	5.98	0.87	2.74	3.36	2.49	0	8.22
North Cachar Hills	6.93	0.17	1.91	1.73	1.39	0.52	0	0
Sibsagar	13.74	4.47	5.50	1.15	0.34	1.72	0	0.11
Sonitpur	16.32	4.79	3.73	3.13	1.95	3.67	0	0.06
Tinsukia	15.93	3.26	1.76	2.20	0.70	8.27	0	0.18

Source: Census of India, 1991 (as given by http:// www.indiastat.com).

Table 4.4c: District-wise Percentage of Inhabited Villages Having Different Types of Medical Institutions (1991) Part-II

Districts	Maternity Home (%)	Child Welfare Centre (%)	Family Planning Centre (%)	T. B. Clinic (%)	Registered Medical Practice (%)	Sub.Medical Practice(%)	Community Health Work (%)	Others (%)
Assam	0.08	0.77	0.41	0.02	10.62	0.02	0.28	0
Barpeta	0.26	1.82	1.53	0	0.57	0.19	0.29	0.10
Bongaigaon	0	0.23	0.12	0	0.58	0	0	0.12
Cachar	0	0.00	0.20	0	1.17	0	0.10	0
Darrang	0.08	0.15	0.23	0.15	0.06	0	0	0
Dhemaji	0	1.71	0.00	0	0.70	0	0	0.27
Dhubri	0	0.16	2.65	0	0.31	0	0	0
Dibrugarh	0	0	0.61	0	0	0	0	0.08
Goalpara	0.27	11.14	0.27	0	0	0	0	0.13
Golaghat	0	0.28	0	0	0.50	0	0.19	0.09
Hailakandi	0.31	1.53	0.31	0.61	1.53	0	0.00	0.00
Jorhat	0.25	0.25	0	0	0	0	0.00	0.38
Kamrup	0.77	0.54	0.54	0	0	0	3.00	0.23
Karbi Anglong	0	0	0.04	0	0	0	0	0.04
Karimganj	0	0	0.67	0	9.85	0	0	0.11
Kokrajhar	0.11	0.22	0.11	0	0.22	0	0	0.11
Lakhimpur	0	1.58	0.09	0	0	0	0	0
Marigaon	0	1.05	0.35	0	0.26	0	0	0
Nagaon	0	0.36	0.22	0	0.19	0.07	1.82	0.36
Nalbari	0	0.37	0.62	0	0.87	0.25	0	0.12
North Cachar Hills	0	0	1.04	0	0	0	0	0.52
Sibsagar	0	0.92	0.11	0	0	0	0	0.11
Sonitpur	0	0.18	0.06	0	0.09	0	0	0.06
Tinsukia	0	0	0.09	0	0.18	0	0	0.09

Source: Census of India, 1991 (as given by http:// www.indiastat.com)

Table 4.4d: District-wise Percentage of Inhabited Villages Having Different Types of Educational Institutions (1991)

Districts	Any Educational Facility	Primary School	Middle School	Secondary School	Jr. College/ Higher. Secondary/Senior Secondary School	Degree College	Adult Literacy Center	Industrial Training School	Other Training School	Any Other
Assam	79.48	78.52	20.08	11.07	0.47	0.46	0.39	0	0.08	0.48
Barpeta	92.07	91.40	34.23	21.70	0.19	1.24	0.10	0	0.38	0.38
Bogaigaon	90.91	89.74	20.4	10.14	0.35	0.23	0.35	0	0	0.35
Cachar	84.67	84.18	24.51	11.43	0.39	0.49	0	0	0	0
Darrang	90.66	89.76	17.85	10.77	0.08	0.75	0.08	0	0	2.18
Dhemaji	72.61	70.72	12.70	6.76	0.27	0.27	0.36	0	0	0
Dhubri	88.32	87.46	30.84	9.19	0.47	0.16	1.25	0	0	1.40
Dibrugarh	85.76	84	12.94	9.04	0	0.31	0	0	0.08	0.08
Goalpara	91.01	89.80	31.01	11.54	2.82	0.94	0.40	0	0.13	0.40
Golaghat	69.78	69.22	16.81	11.52	0.85	0.57	0.19	0	0.09	0.47
Hailakandi	92.35	91.44	53.82	8.87	0.31	0	0	0	0	0.53
Jorhat	89.10	88.35	27.32	25.19	0.25	2.13	0.25	0	0.25	0.13
Kamrup	85.38	84.85	28.46	19.15	0.85	0.85	0.46	0	0.15	0.31
Karbi Anglong	33.69	33.17	4.25	2.58	0	0.08	0.24	0	0	0
Karimganj	89.14	88.47	18.25	5.38	0.34	0	0	0	0	0.22
Kokrajhar	90.90	89.60	14.08	6.61	0.33	0.22	0	0	0	0
Lakhimpur	89.56	88.51	31.23	14.63	0.53	0.35	0.35	0	0.53	0.79
Marigaon	90.33	88.93	28.12	15.47	0.35	0.35	0	0	0	0.53
Nagaom	86.62	85.53	26.91	13.38	1.53	0.36	0.53	0	0.15	1.89
Nalbari	90.54	90.16	31.01	19.80	0.62	0.75	0.75	0	0	0.29
North Cachar Hills	82.32	81.63	6.59	2.60	0	0.17	0.87	0	0.17	0
Sibsagar	86.60	85.45	24.51	17.18	0.11	0.69	0.11	0	0	0.46
Sonitpur	70.79	69.66	9.46	8.75	0.24	0.18	0.95	0	0	0
Tinsukia	74.03	72.71	10.74	5.90	0.70	0.18	0	0	0	0

Source: Census of India, 1991 (as given by http:// www.indiastat.com)

Table 4.4e: District-wise Percentage of Inhabited Villages Having Post & Telegraph Offices and Telephone Connections

Districts	Percentage of inhabited Villages Having			
	Any P&T Facilities	Post Office	Telegraph Office	Telephone Connections
Assam	13.34	12.33	0.82	0.70
Barpeta	18.16	17.97	0.29	0.19
Bongaigaon	13.87	12.94	0.93	0.58
Cachar	25.99	23.05	2.54	0.59
Darrang	10.99	10.24	0.90	0.90
Dhemaji	5.32	5.32	0	0
Dhubri	10.98	10.20	0.70	0.78
Dibrugarh	14.40	12.02	1.23	1.99
Goalpara	10.47	9.40	1.07	0
Golaghat	12.84	11.99	0.85	0.28
Hailakandi	25.99	24.16	1.53	2.14
Jorhat	22.68	20.43	1.75	0.75
Kamrup	14.62	14.31	0.38	0.23
Karbi Anglong	2.10	1.98	0.12	0.08
Karimganj	17.13	15.34	1.90	1.01
Kokrajhar	10.62	9.97	0.75	0
Lakhimpur	12.98	11.93	0.53	0.53
Marigaon	14.94	14.41	0.53	0
Nagaon	20.29	19.27	1.31	0.65
Nalbari	25.90	25.53	0.37	0.25
North Cachar Hills	4.51	3.99	0.35	0.17
Sibsagar	14.20	13.40	0.57	0.34
Sonitpur	12.54	11.30	0.89	2.13
Tinsukia	11.62	9.07	0.70	2.29

Source: Census of India, 1991 (as given by http:// www.indiastat.com)

Table 4.4f: District-wise Percentage of Inhabited Villages Having Electricity for Different Purpose (1991)

Districts	Any Purpose	Domestic Purpose	Agriculture Purpose	Other Purpose	All Purpose
Assam	53.18	53.03	1.71	3.69	1.17
Barpeta	56.88	56.88	3.73	3.82	2.29
Bongaigaon	46.74	45.57	0.93	2.56	0
Cachar	56.15	54.79	2.73	4.10	0.68
Darrang	57.15	57.15	1.66	2.56	1.28
Dhemaji	6.67	6.67	0	0	0
Dhubri	59.97	59.74	0.31	0.78	0.08
Dibrugarh	74.35	74.35	2.45	5.97	1.23
Goalpara	61.21	61.21	0.40	0.94	0.13
Golaghat	48.44	47.40	1.51	5.85	1.23
Hailakandi	58.41	55.66	3.98	5.81	3.36
Jorhat	71.93	71.55	4.76	7.77	3.76
Kamrup	60.31	60.08	0.69	2.15	0
Karbi Anglong	24.72	24.72	1.71	1.71	1.71
Karimganj	57.45	57.22	0	2.24	0
Kokraijhar	52.22	52.22	3.36	3.90	3.36
Lakhimpur	40.09	37.54	0.61	4.30	0
Marigaon	42	42	0.70	1.23	0
Nagaon	69.38	69.38	4.15	5.89	2.47
Nalbari	77.33	77.33	2.24	3.36	2.12
North Cachar Hills	15.60	15.08	0.52	0	0
Sibsagar	83.51	83.39	0.69	3.89	0.57
Sonitpur	60.73	60.62	0.83	7.69	0.77
Tinsukia	68.93	68.93	2.29	7.04	2.20

Source: Census of India, 1991 (as given by http:// www.indiastat.com)

Table 4.5: Incidence of poverty in different economic and social groups: Assam and All India

	Rural				Urban			
	Head-count index (per cent)		Per cent of total poor		Head-count index (per cent)		Per cent of total poor	
	1987-8	1993-4	1987-8	1993-4	1987-8	1993-4	1987-8	1993-4
Self employed in agriculture	45.72 (37.28)	52.01 (30.04)	50.62 (31.36)	42.07 (28.46)	-	-	-	-
Self employed in non-agriculture	34.89 (38.72)	46.93 (33.31)	8.23 (10.67)	9.75 (10.50)	15.72 (36.34)	8.73 (30.34)	49.56 (38.36)	35.47 (37.4)
Agricultural labour	73.04 (61.80)	76.76 (55.21)	25.21 (42.36)	26.85 (43.44)	-	-	-	-
Other labour	57.16 (47.90)	80.73 (41.81)	10.35 (9.59)	14.41 (8.43)	-	-	-	-
Employed with regular wages or salaries	-	-	-	-	6.24 (20.99)	7.84 (16.53)	24.63 (29.45)	35.94 (26.16)
Casual labour	-	-	-	-	48.54 (61.24)	40.61 (55.12)	23.48 (24.59)	26.0 (26.40)
Scheduled castes	42.78 (55.22)	61.15 (49.04)	6.84 (24.72)	9.94 (28.24)	21.40 (47.07)	16.78 (42.35)	22.48 (17.63)	11.30 (21.65)
Scheduled tribes	53.84 (59.92)	56.35 (50.07)	16.80 (14.62)	14.14 (14.40)	9.96 (44.69)	8.35 (35.67)	3.39 (5.67)	3.31 (4.43)

Source: NSSO 43rd and 50th rounds.

Notes:

Figures for all India are given in parentheses.

'Head count index' indicates the percentage of population in each group that fall below poverty line. For example, in Assam 52.01 per cent of the self-employed population in agriculture were poor in 1993-94. The corresponding all India figure is 30.04 per cent.

'Percent of total poor' indicates the percentage distribution of the poor across different groups. For example, 42.07 per cent of the total poor population in Assam is self-employed in agriculture.

The poverty estimates correspond to the Official Poverty lines (OPL). OPL for rural India: Rs 125.68 and Rs 214.31 respectively for 1987-88 and 1993-94 and for urban India Rs 161.31 and Rs 278.68 respectively for the years 87-88 and 93-94.

OPL for rural Assam: Rs 137.35 and Rs 256.73 respectively for the years 87-88 and 93-94 and for urban Assam Rs 129.11 and Rs 221.94 respectively for the years 87-88 and 93-94.

8. From the distribution of the total poor across different groups it is seen that the largest fraction of the poor in rural areas belong to the 'self employed in agriculture' category followed by agriculture and other labour (Figures 4.4 and 4.5). There has not been much change in the occupation wise distribution of the poor in rural areas between the two periods 1987-88 and 1993-94. In the urban areas there has been a remarkable change in the distribution of the poor across occupation groups. The proportion of the poor belonging to the self employed category dropped from 50 per cent in 1987-88 to 35 per cent in 1993-94. The proportion of the poor belonging to the employed with regular wages/salaries category however increased from 25 per cent in 1987-88 to 36 per cent in 1993-94.

4.2.4. Areas of action

9. The government should assign top priority to tackling rural poverty. It should aim at reducing the incidence of poverty in rural areas by strengthening the capabilities of the poor and vulnerable groups to earn income through better education and health facilities. The existence of several anti-poverty programs such as the food subsidy program through the Public Distribution System (PDS), the employment generation program, Jawahar Rozgar Yojana (JRY) and the subsidized credit program for self-employment (IRDP) has not made much impact on poverty. The reasons for the poor performance, which holds good for most States in India, have been discussed in several evaluation reports. In the case of Assam, survey data reveals (Table 4.6) that a greater percentage of the population had access to PDS compared to All India. However, the income support provided by these programs has not been large enough to pull people out of poverty on a sustained basis. Access to IRDP is found to be lower in Assam compared to all India. In both PDS and IRDP, leakage in terms of benefits accruing to the non-poor has been high. Contrary to expectations, asset formation has been lacking in rural areas through employment programs.

10. In order to reduce geographical disparities, the government needs to identify the strengths of different regions and devise anti-poverty strategies appropriate for those regions. The effectiveness of poverty alleviation programs can be improved by targeting poorer villages and districts. The district or the village level poverty map can be obtained by combining NSS survey data with Census data since the sample size for the NSS at the level of the district is insufficient to obtain estimates of statistical significance.[3] With limited resources it is important that the policies and programs first target the regions with the greatest proportion of the poor. Instead of spreading resources thinly across many people they could be restricted to a selected few. In the case of IRDP for example, the credit extended would then be adequate for the beneficiaries to come out of poverty on a sustained basis.

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[3] See Bigman and Srinivasan, 2001, Geographical Targeting of Poverty Alleviation Programs: Methodology and Applications in Rural India, IGIDR (mimeo) and the references therein.

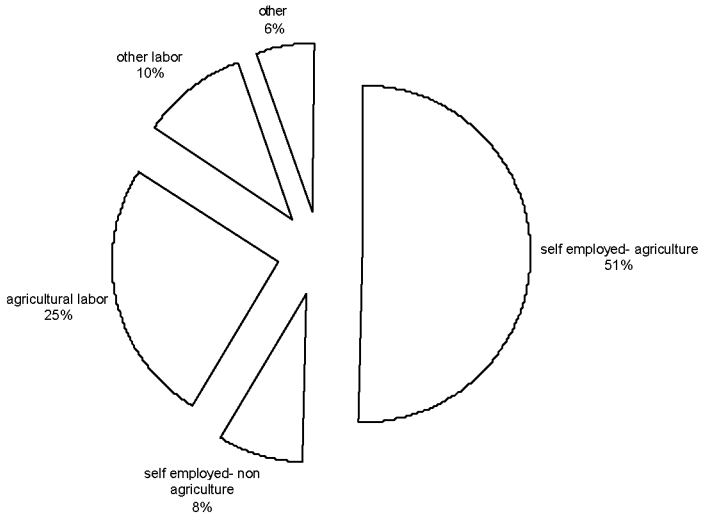

Figure 4.4: Distribution of rural poor 1987-88

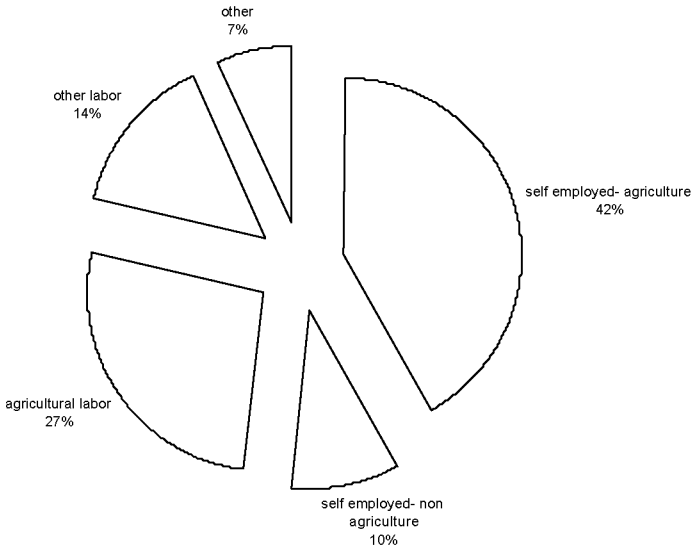

Figure 4.5: Distribution of rural poor 1993-94

Table 4.6: Access to PDS and IRDP: Beneficiaries as per cent of total

	1987-88		1993-94	
	All-India	Assam	All-India	Assam
PDS rural	62.85	74.32	77.23	86.35
PDS urban	63.86	50.61	68.97	57.91
IRDP rural	6.83	3.17	7.51	2.69

Source: Dubey (2000): Hunger and poverty in North Eastern states, Implications for food security, paper presented at the National Seminar on Food security in India, CESS Hyderabad, March 25-27.

Notes: Figures in each cell denote the percentage of population benefiting from the program. For example, 62.85 per cent of rural population in All India and 74.32 per cent of rural population in Assam benefit from PDS.

11. Since the majority of the poor are employed in agriculture they are vulnerable to fluctuations in weather, floods etc. There is therefore a need to develop risk management mechanisms. At the individual level this can be done through diversification of income sources (e.g. pisciculture, livestock and horticulture). At the community level this has to be done through mechanisms for common property and infrastructure management.

12. Since a large fraction of the poor are self-employed in agriculture, diversification through better irrigation facilities and water management can increase their incomes substantially. The chain of value addition has to be developed through better roads, storage, transport and other marketing infrastructure.

13. Underdeveloped rural marketing infrastructure has been the hindering factor for the commercialization and diversification of agriculture into areas such as horticultural and floricultural activities. There is therefore a need to develop contract farming in cooperation with the corporate and business sectors to remove the initial market uncertainties faced by farmers.

14. The food-processing sector has great potential for generating rural non-farm employment. However, this would require a transition from subsistence to commercialized agriculture. Captive cultivation of raw material would be needed to prevent under utilization of productive capacities. Factors that can help in the overall development of the non-farm sector include, deregulation of markets through removal of restrictions under the Essential Commodities Act, removal of small scale sector reservation and entry barriers in sectors such as dairy, removal of selective credit controls etc.

15. A major part of the rural infrastructure can be provided through public employment schemes. The Maharashtra model of Employment Guarantee Scheme (EGS) can be used where urban employees are taxed to fund this scheme. It is now well known that such schemes can have several advantages. They are self-financing, reduce poverty through provision of

employment, ensure minimum wages to labour and build public assets. The EGS wage is set at such a level that only those unable to find employment elsewhere are attracted to it. This self-selecting feature of such programs makes it very convenient to target benefits at the poor.

16. The general experience through out the country including Assam has been that the administration of most developmental and anti-poverty programs is centrally controlled. Funding and administering of Centrally sponsored schemes has been in the hands of Central and State government ministries and departments with inadequate local participation in decision making. In order to strengthen the decentralization process the 73rd constitutional amendment provided for democratically elected rural local governments at three levels (district, block and village). Decentralized process however is yet to take off in Assam. It has been observed that funds allocated to the lower level bodies are not released by the State government. Elections to the Panchayats have not been held since 1997 when they were due.

17. Most of the anti-poverty programs are in the nature of short-term measures. The long-term solution lies in increasing the overall productivity in the economy. High percentage of rural population and limited opportunities for labour absorption in the urban areas underscores the importance of increasing agricultural productivity. However, for sustained poverty alleviation policy measures have to be taken not only to increase agricultural productivity but also to increase urban employment through greater urbanization and industrial growth. In the current national scenario where almost all the states are vying with each other to attract private investment through different concessions, tax holidays, etc, Assam has a clear disadvantage due to poor law and order situation and infrastructural facilities. In the short term there is hope mainly from local entrepreneurs who can deal with militants effectively. Industrial strategy should focus initially on development of industries to meet local demand since the transport bottlenecks make exports unattractive. To begin with the state should exploit its own resources to the maximum. Untapped potential exists in the fields of tourism and forest produce.

18. Modern technology could be used to overcome some of the existing infrastructural bottlenecks. For example, cellular phones can be provided in rural areas on the lines of Grameen phone in Bangladesh. License fee to cellular operators can be reduced for creating networks in rural areas. Easy access to information on prices etc from markets can help farmers get the upper hand on middleman to sell their produce in urban markets.

4.3. Health and education in Assam

19. It is well known that low economic growth and widespread poverty get reflected in poor social indicators of development such as low levels of achievement in health and education. Assam ranks 12 among 16 States when ordered in the descending order of Human Development Index (HDI) and Gender Development Index (GDI). In fact it can be grouped

with the BIMARU States in this respect. Rural urban disparities are high in several of the indicators. Life expectancy at birth is 54.1 in rural as compared to 63.3 in urban areas. 52 per cent of children are underweight in rural compared to 37 per cent in urban areas. These disparities are a matter of concern especially if we consider the fact that the level of urbanization in Assam is quite low. Around 10 per cent of the population lives in urban areas. The corresponding figure at the all India level is 30 per cent.

20. Publicly provided social services especially those on education and healthcare play an important role in reducing poverty. The usefulness of education and its role in poverty reduction is widely recognized. Investment in quality education makes people more productive in home and at work. Evidence suggests that schooling raises labour productivity through increasing cognitive competencies of people (increases their capacity for logical and analytical thinking and reasoning). Non-cognitive competencies that are relevant for economic and social change are also enhanced through quality education. Educated people become better informed and more open to new ideas and technological changes. Educational attainment is known to have a positive effect on health outcomes also. There is substantial evidence linking high fertility and mortality to low levels of female literacy and educational attainment. It is also observed that infant and child mortality rates are lower for households with higher levels of education (Table 4.7). The National Family Health Survey data reveals that the total fertility rate for India is 1.5 children higher for illiterate women than for women with at least a high school education. Infant mortality rates for all India declines sharply with increasing education of mothers ranging from a high of 87 deaths per 1000 live births for illiterate mothers to a low of 33 deaths per 1000 live births for mothers who have at least completed high school (Table 4.8). At the same time we also notice that school attendance and educational attainment among the poor are lower compared to others (Table 4.9). It is also the case that educational attainment among females is lower compared to males and rural areas lag behind urban ones (Table 4.10).

21. Although, in general, a positive relation is found between social development and economic growth, policies aimed at increasing economic growth alone are not sufficient to ensure social development. Direct intervention by the government is necessary not only for redistribution purposes but also because most of the basic services have a public good characteristic. Insofar as poverty acts as a constraining factor in the utilization of these services by the poor the strategies and priorities of the Assam government should be focused on the core issue of poverty, along with a greater provision of these services. The latest available data on households' access to basic amenities shows that Assam fares worse than the national average in indicators such as access to electricity and drinking water. Only 26 per cent of the households in Assam are with electricity compared to the national average of 60 per cent and 72 per cent in Kerala. In this aspect the other North-Eastern States fare much better than Assam (Table 4.11).

4.3.1. Health sector:

22. Good health is important to keep the labour force productive and efficient. Frequent illnesses and inadequate nutrition will have adverse impact on the incomes of households making them vulnerable. Good health not only increases productivity and earnings of an individual but also improves the overall quality of life and the socio-economic development of the general population. Malnourishment and under-nourishment can be avoided not just by poverty reduction and higher food intake but also through good health that can be brought about through improved access to sanitation and drinking water facilities.

Table 4.7: Infant and child mortality by level of education- Assam (1991 census)

	Infant Mortality			Under five Mortality		
	Male	Female	Total	Male	Female	Total
Rural						
Illiterate	97	92	94	135	124	131
Literate but below middle	77	71	73	99	99	99
Middle but below matric	60	54	57	72	64	69
Matric but below graduate	48	48	47	56	60	59
Graduate and above	50	47	49	59	55	56
Urban						
Illiterate	68	74	72	94	102	101
Literate but below middle	61	57	59	73	73	71
Middle but below matric	36	39	39	41	46	41
Matric but below graduate	22	25	22	27	30	27
Graduate and above	32	28	29	39	34	36
Rural-Urban Combined						
Illiterate	69	73	73	90	101	95
Literate but below middle	74	71	72	95	95	95
Middle but below matric	56	51	53	68	63	65
Matric but below graduate	39	39	39	44	47	46
Graduate and above	36	42	38	42	49	45

Source: Irudayarajan and Mohanachandran, EPW, December 16-22, 2000

Table 4.8: Fertility rates and infant and child mortality rates by mother's education, 1998-99

	Total fertility rate	Mean number of children ever born to ever-married women age 40-49 years	Neonatal mortality	Post neonatal mortality	Infant mortality	Under-five mortality
Illiterate	3.47	4.98	55.3	31.2	86.5	122.8
Literate, < middle complete	2.64	4.06	40.5	18	58.5	75.8
Middle school complete	2.26	3.41	33.7	14.4	48.1	58.1
High school complete and above	1.99	2.66	24.3	8.5	32.8	37.1
All	2.85	4.45	47.7	25.3	73.0	101.4

Source: NFHS-2, Tables 4.4 and 6.4

Table 4.9: Achievement levels in education by status of wealth

	Proportion of 6-14-year-olds in school		Proportion of 15-19-year-olds who completed at least grade 8	
	Bottom 40 percent	Top 20 percent	Bottom 40 percent	Top 20 percent
Andhra Pradesh	0.457	0.917	0.160	0.859
Assam	**0.615**	**0.846**	**0.229**	**0.866**
Bihar	0.378	0.942	0.183	0.864
Gujarat	0.552	0.962	0.212	0.845
Haryana	0.605	0.957	0.189	0.728
Karnataka	0.507	0.943	0.205	0.816
Kerala	**0.887**	**0.975**	**0.531**	**0.923**
Madhya Pradesh	0.461	0.937	0.172	0.832
Maharashtra	0.671	0.962	0.279	0.832
Orissa	0.552	0.969	0.189	0.908
Punjab	0.427	0.957	0.153	0.777
Rajasthan	0.414	0.910	0.141	0.773
Tamil Nadu	0.717	0.950	0.269	0.838
Uttar Pradesh	0.484	0.939	0.239	0.836
West Bengal	0.527	0.902	0.137	0.734

Source: Filmer and Prichet (1998)

Table 4.10: Gender and rural-urban gaps in educational attainment: Assam 1992-93

Proportion of 15- to 19-year-olds who have completed different grades						
Grade	Male	Female	Gap	Urban	Rural	Gap
1	0.796	0.635	0.161	0.878	0.692	0.186
2	0.785	0.62	0.165	0.871	0.678	0.193
3	0.756	0.601	0.155	0.862	0.652	0.21
4	0.73	0.572	0.158	0.839	0.624	0.215
5	0.645	0.513	0.132	0.789	0.549	0.24
6	0.592	0.481	0.111	0.746	0.508	0.238
7	0.532	0.434	0.098	0.701	0.452	0.249
8	0.47	0.374	0.096	0.642	0.391	0.251
9	0.374	0.298	0.076	0.543	0.307	0.236

Source: Filmer (1999)

Table 4.11: Living conditions by state, 1998-99

	Percentage of households:					
State	With Electricity	With Drinking Water that is piped or from a hand pump	With a toilet or latrine	Using biomass fuel for cooking	Living in a *pucca* house	Mean number of persons per room
India	**60.1**	**77.9**	**35.9**	**71.7**	**32**	**2.7**
Arunachal Pradesh	68.9	80.7	73	80.8	14.2	2.2
Assam	**26.4**	**60.1**	**63**	**87.1**	**10.9**	**2.1**
Manipur	75.3	48.9	92	69.2	7.1	2.1
Meghalaya	41.2	42.1	52	83.5	14.5	2
Mizoram	84.1	63.2	97.7	57.4	16.2	2.6
Nagaland	56.3	40.5	74.3	86.1	18.1	1.6
Sikkim	80.7	84.6	72.7	63.2	50.6	2
Kerala	**71.8**	**19.9**	**85.2**	**81.7**	**79.8**	**1.3**

Source: NFHS-2, 1998-99. Table 2.12

Notes: Majority of the households in Kerala obtains their drinking water from wells.

23. The health sector in Assam is characterized by the following. Although the infant mortality rate in Assam has been falling over the years it is still higher than the all India rate. Female infant mortality in 1997 was, for example, 77.8 per thousand live births compared to 12.9 in Kerala and 72.2 at the all India level. High mortality is mainly due to neo-natal mortality, which is affected by several factors including health of mother, birthing facilities, care of newly born etc. Part of it is also due to the fact that a large percentage of the population is deprived of access to basic health services such as vaccinations (BCG, measles, DPT, Polio, etc) (Table 4.13). The level of utilization of vaccination services in Assam is lower than the all India average as well as most other northeastern States. Disease control, particularly of vector born diseases such as malaria and encephalitis is an important area of concern in

Assam. Since the poor are more susceptible to these diseases provision of safe drinking water and sanitation facilities becomes extremely important.

Table 4.12: Infant and child mortality by state, 1998-99

State	Neonatal Mortality (NN)	Post neonatal Mortality (PNN)	Infant Mortality (${}_1q_0$)	Child Mortality (${}_4q_1$)	Under-five Mortality (${}_5q_0$)
India	**43.4**	**24.2**	**67.6**	**29.3**	**94.9**
Arunachal Pradesh	41.8	21.3	63.1	37.4	98.1
Assam	**44.6**	**24.9**	**69.5**	**21.4**	**89.5**
Manipur	18.6	18.4	37.0	19.9	56.1
Meghalaya	50.7	38.3	89.0	36.2	122.0
Mizoram	18.8	18.2	37.0	18.4	54.7
Nagaland	20.1	22.0	42.1	22.7	63.8
Sikkim	26.3	17.6	43.9	28.4	71.0
Kerala	**13.8**	**2.5**	**16.3**	**2.6**	**18.8**

Source: NFHS-2, Table 6.6

Notes:

Mortality is given as deaths per 1000.

The definitions are as given below.

Neonatal mortality: the probability of dying in the first month of life.

Post neonatal mortality: the probability of dying after the first month of life but before the first birthday.

Infant mortality: the probability of dying before the first birthday.

Child mortality: the probability of dying between the first and the fifth birthday.

Under-five mortality: the probability of dying before the fifth birthday.

Post neonatal mortality is computed as the difference between the infant and neonatal mortality rates

Table 4.13: Utilization of vaccination services, 1998-99

	Percentage Vaccinated		DPT			Polio					
State	BCG	Polio 0	1	2	3	1	2	3	Measles	All[1]	None
India	71.6	13.1	71.4	65.0	55.1	83.6	78.2	62.8	50.7	42.0	14.4
Arunachal Pradesh	54.2	4.5	57.4	52.7	41.8	67.6	62.5	43.3	33.6	20.5	28.7
Assam	53.5	3.1	57.4	48.5	37.5	61.8	53.6	37.9	24.6	17.0	33.2
Manipur	71.0	32.1	76.4	71.0	59.1	81.3	76.9	62.5	45.8	42.3	17.2
Meghalaya	46.1	11.5	44.8	36.8	25.4	51.8	43.8	27.6	17.7	14.3	42.3
Mizoram	88.2	4.6	86.9	83.9	69.5	88.3	83.5	71.9	71.0	59.6	10.5
Nagaland	46.1	5.5	48.1	40.9	29.6	66.6	60.3	41.8	19.6	14.1	32.7
Sikkim	76.5	8.2	75.7	71.7	62.5	79.8	75.7	63.5	58.9	47.4	17.6
Kerala	96.2	60.6	96.0	94.4	88.0	96.9	95.2	88.4	84.6	79.7	2.2

Source: NFHS-2, Table 6.11

Note: Percentage of children age 12-23 months who received specific vaccinations at any time before the interview (according to the Vaccination card or the mother). Table includes only surviving children from among the two most recent births in the three years preceding the survey. All includes BCG, measles, and three doses each of DPT and polio vaccines (excluding Polio 0).

24. Maternal mortality rate (MMR) in Assam in 1997 (401 per 100,000 live births) was close to the all India average of 407 (Table 4.14). This means that each year approximately one maternal death occurs for every 200 pregnancies. Assam's MMR is twice that of Kerala, five times that of Tamil Nadu and thirteen times that in Gujarat. In terms of this indicator Assam ranks among the worst performing States namely Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar. The large number of deaths each year due to pregnancy related causes is mainly due to large number of deliveries being conducted at home and by untrained persons. Primitive methods of childbirth are still prevalent in parts of Assam. In addition lack of adequate referral facilities to provide emergency obstetric care for complicated case also contributes to the high maternal mortality and morbidity. Assam's access to many of the antenatal and maternal care services is lower than the all India average and most other North-Eastern states (Tables 4.15-4.16). A significant proportion of maternal deaths are due to unsafe abortion. Medical Termination of Pregnancy is therefore an important means of reducing maternal mortality. A wide variation is found among districts in terms of access to public services such as immunization for children and facilities for safe delivery for pregnant women (Tables 4.16a and 4.16b).

Table 4.14: Health indicators by State

	Maternal Mortality Rate, 1997	Life Expectancy at birth 1989-93		Infant Mortality Rate, 1997	
		Female	Male	Female	Male
Andhra Pradesh	154	61.5	59.5	62.0	64.2
Assam	**401**	**55.3**	**54.6**	**77.8**	**74.4**
Bihar	451	57.2	59.7	71.1	71.6
Gujarat	29	61.1	59.0	62.5	62.2
Haryana	105	63.7	62.5	68.1	68.3
Karnataka	195	63.5	60.2	54.2	50.8
Kerala	**195**	**74.7**	**68.8**	**12.9**	**11.5**
Madhya Pradesh	498	53.8	54.1	90.0	98.3
Maharashtra	135	65.4	63.0	44.7	49.7
Orissa	361	55.3	55.7	98.1	94.5
Punjab	196	67.6	65.2	54.2	48.3
Rajasthan	677	58.5	57.4	96.2	74.7
Tamil Nadu	76	63.4	61.4	57.3	48.0
Uttar Pradesh	707	55.1	56.5	90.3	81.3
West Bengal	264	62.3	60.8	51.0	59.2
All India	408	Na	Na	72.2	70.3

Sources:Economic Survey, 2001-2002, Table 10.10, Page 201.

Notes: Maternal mortality rates are given as deaths per 100,000 live births. Infant mortality rate is given as deaths per 1000 live births.

Table 4.15: Access to antenatal care by State, 1998-99

State	Percentage that received at least one antenatal check-up	Percentage that received three or more antenatal check-up	Percentage that received an antenatal check-up in the first trimester of pregnancy	Percentage that received two or more Tetanus toxoid Injections	Percentage given any iron and folic acid tablets or syrup	Percentage that received supply of iron and folic acid tablets or syrup for 3+ months
India	**65.4**	**43.8**	**33.0**	**66.8**	**57.6**	**47.5**
Arunachal Pradesh	61.6	40.5	24.5	45.6	56.3	47.6
Assam	**60.1**	**30.8**	**30.7**	**51.7**	**55.0**	**45.3**
Manipur	80.2	54.4	45.0	64.2	50.0	38.0
Meghalaya	53.6	31.3	20.6	30.8	49.5	40.6
Mizoram	91.8	75.8	39.6	37.8	72.7	62.0
Nagaland	60.4	23.1	23.8	50.9	42.5	26.7
Sikkim	69.9	42.6	30.2	52.7	62.4	50.4
Kerala	**98.8**	**98.3**	**81.1**	**86.4**	**95.2**	**88.6**

Source: NFHS-2, Table 8.7

Notes:

Antenatal care (ANC) refers to pregnancy related health care provided by a doctor or health worker in a medical facility or at home.

The table includes only the two most recent births during the three years preceding the survey.

Table 4.16: Access to maternal care by state, 1998-99

State	Percentage that received all recommended types of antenatal care[1]	Percentage of births delivered in a medical institution	Percentage of deliveries assisted by a health professional[2]	Percentage of non-institutional deliveries with a post-partum check-up within two months of birth[3]	Percentage of non-institutional deliveries with a post-partum check-up within two days of birth[3]
India	**20.0**	**33.6**	**42.3**	**16.5**	**2.3**
Arunachal Pradesh	17.3	31.2	31.9	10.5	0.3
Assam	**15.8**	**17.6**	**21.4**	**25.5**	**0.5**
Manipur	18.3	34.5	53.9	27.1	1.4
Meghalaya	10.4	17.3	20.6	20.8	0.0
Mizoram	13.5	57.7	67.5	20.9	0.9
Nagaland	8.9	12.1	32.8	4.3	0.0
Sikkim	15.3	31.5	35.1	38.0	0.7
Kerala	**64.9**	**93.0**	**94.0**	**27.4**	**7.5**

Source: NFHS-2, Table 8.13

Note:

Table includes only the two most recent births during the three years preceding the survey.

[1] Three or more antenatal check-ups (with the first check-up within the first trimester of pregnancy), two or more tetanus toxoid injections, and iron and folic acid tablets or syrup for three or four months.

[2] Doctor, auxiliary nurse, midwife, nurse, midwife, lady health visitor, or other health professional.

[3] Based on the births in the 2-35 months preceding survey.

Table 4.16a: District-wise Eligible Women Giving Safe Birth- 1999

	Percentage of Eligible women with Live/Still Births who had					
Districts	3 or more ANC Check -up	Two or more TT Injections during Pregnancy	Consumed one or two IFA Tablets Regularly	Total Institutional Delivery	Delivery at Home by Trained Personnel	Total Safe Delivery
Bongaigaon	20.4	49	54.5	16.7	9	25.7
Darrang	22.7	66.3	64.6	20	14.5	34.5
Dhubri	21.2	46.5	50	11.5	6.9	18.4
Goalpara	9.6	47.9	43.4	10.6	10.6	21.2
Hailakandi	31.1	47.2	47.8	16.9	13.2	30.2
Kamrup	38.2	63.6	72.7	32.6	8.5	41.1
Karimganj	29.6	59.6	45.7	12.7	11.8	24.5
Lakhimpur	33	60.4	45	21.7	6.3	28
Nagaon	7.8	50.8	41.6	5.6	4.4	10
North Cachar Hills	8.7	12.4	24	7.7	14.9	22.7

Source : Ministry of Health and Family Welfare

Table 4.16b: District-wise Children who Received Immunization

Districts	Percentage of Children who Received					
	BCG	DPT (3 Injections)	Polio (3 Doses)	Measles	Complete Immunization	At Least one Dose of Vitamin 'A'
Bongaigaon	71.9	67.3	69.7	60.4	51.6	48
Darrang	28.9	57.2	70.2	60.5	48.5	34.3
Dhubri	75.6	63.2	62	53.7	48	12.5
Goalpara	55	44.6	46.9	38.4	34.2	27
Hailakandi	61.2	41.6	38.1	33.5	20.8	9.7
Kamrup	82.5	58.9	74.6	58.9	46.4	47.8
Karimganj	56.2	38.9	57.2	27.1	23	45
Lakhimpur	80.7	76.6	77.3	77.6	75.2	90.7
Nagaon	66.3	42.9	64.4	40.1	31	14.3
North Cachar Hills	53.6	37	63.3	12.9	7.5	2.4

Source: Ministry of Health and Family Welfare.

25. Though the per capita revenue expenditure on health in Assam is lower compared to the average of all States, the share of SDP spent on health services in Assam is quite high, above the average of all States (Figures 4.6 and 4.7). Why then do the expenditures not get translated into better indicators?

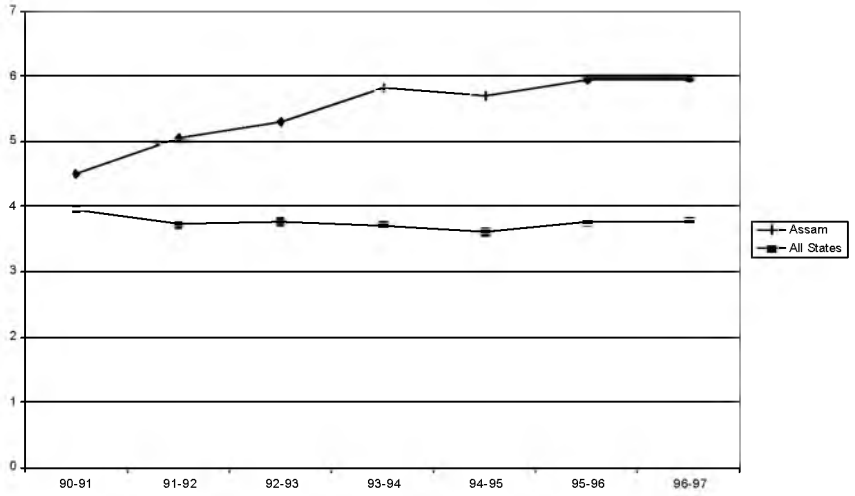

Figure 4.6: Education expenditure as percent of SDP

4.3.1.1. Reasons for inefficiencies

26. While there appears to be adequate physical health infrastructure with primary health centres (PHC) and hospitals, etc, the quality of service provision is low. Lack of adequate complementary infrastructure such as roads, etc makes health services effectively inaccessible to people. Poor living conditions in villages with inadequate infrastructure facilities such as electricity, roads and sanitation make it unattractive for doctors and other health workers to work in PHCs.

27. There is also a high degree of administrative inefficiency. A high percentage of current expenditure goes to salaries and wages. Posts created under plan expenditure continue to exist even after the completion of projects. Due to this problem the Central government allowed the use of plan expenditure up to 20 per cent on the revenue account. However, currently 90 per cent of the plan expenditure is spent on revenue account.

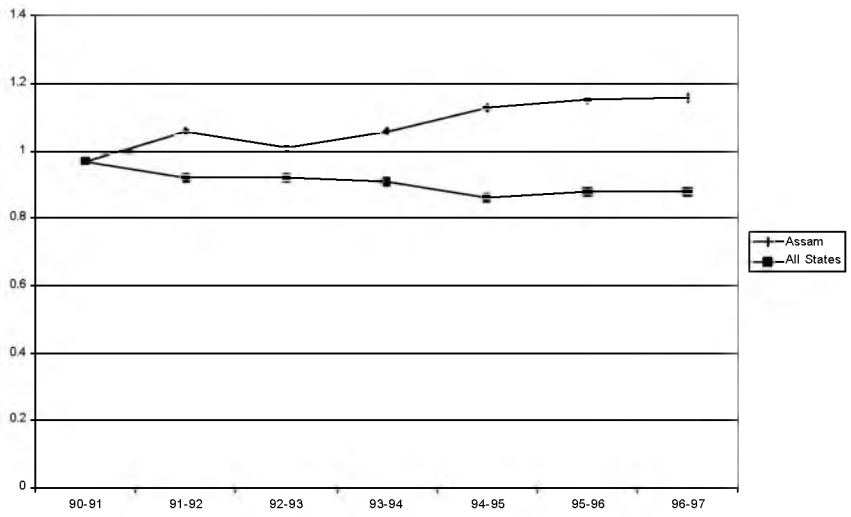

Figure 4.7: Health expenditure as percent of SDP

28. Other problems pertain to the design of the health sector expenditures. Greater importance is given to curative, rather than preventive care and cost recovery is low even from well off individuals.

4.3.1.2. Areas of action

29. The delivery of immunization and maternal care services needs to given top priority in order to improve Assam's ranking in terms of human development. Maternal, infant and child mortality is influenced by a whole range of socio-economic factors, the status of women, which includes low level of education, economic dependency and lack of access to services. States like Kerala, Karnataka, Tamil Nadu, Maharashtra, Andhra Pradesh, Punjab and Haryana, which have relatively better socio-economic and education status, have lower MMR than the other states. Thus, besides improving the maternal health care services, it is necessary to improve the social status of women, including the education standard, to reduce the current level of MMR. To end unwanted pregnancies, women resort to abortions. The absence of appropriate quality of contraception is an important reason for abortion. Lack of safe abortion facilities in rural areas force women to resort to unsafe abortions. Most of the services are located in the urban areas, while nearly 90 per cent of the population lives in the rural areas. This distinct urban bias in the provision of these services needs to be corrected.

30. The resource constraint faced by the health sector implies that there is an urgent need to improve cost recovery through introduction of reasonable levels of user charges at least in certain areas such as curative services. Resources generated should be sufficient enough to operate and maintain the existing capital equipment. Households' ability to pay can be

enhanced through risk sharing mechanisms such as health insurance and other forms of social financing. Employer health-based insurance schemes need also to be developed.

31. There is also a need to protect the poorer and vulnerable sections through direct targeting. Health cards (similar to ration cards) can be issued to the poor so that they become eligible for free or subsidized treatment and other services. Clear guidelines can be specified for qualifying to be a beneficiary. And social workers, NGOs, etc can aid the process of identifying beneficiaries.

32. Expenditure decentralization with strict accountability and transparency can increase the efficiency of use of funds through greater involvement of stakeholder fraternity. Direct resources transfers to the local level will lead to increased participation of the local authorities in health care delivery. However, capacity building for management and leadership at the local level is necessary to improve governance. It is crucial to have institutional reforms to make them responsive to the needs of the traditionally marginalized groups such as women, tribal groups and the poor in general. The *Rogi Kalyan Samiti* (RKS) or Patients' Welfare Committee in Madhya Pradesh is an example where a community of volunteers (stakeholders) was allowed to collect user fees to generate funds to improve hospital amenities.[4] The RKS are registered as autonomous NGOs and have complete control over the funds.

4.3.2. Education:

33. The education scene in Assam is characterized by the following facts. A large number of eligible children of school going age still remain out of school. The recent NFHS survey indicates that 72 per cent of the population in the 6-17 age group is attending school in Assam, which is same as the all India average (Table 4.17). This figure is however much lower than that of Kerala (91 per cent) and lower than all other North-Eastern States (in the range of 80 per cent to 87 per cent). The school completion rates are found to be low, indicating high dropout rates. Median number of years of schooling completed among the male population age 6 and above is 4.4 compared to 8.1 for Kerala and 5.5 for all India (Table 4.18). Female educational achievement in Assam is found to be better relative to the all India performance. The various gaps: rural-urban gap, gender gap (male/female) and poverty gap (poor/non-poor)) is very much evident from the data on educational attainment. The problem of school dropouts in Assam relative to other Indian States has also been brought out sharply in the Economic Survey 2000-01 (Table 4.19). During 1998-99, the gross enrolment ratio for primary school (class I-V) children was 109.63 in Assam compared to 92.14 per cent in all India. But for the upper primary level (classes VI to VIII), the enrolment ratio was merely 61.12 compared to 57.58 per cent for all India. Although the primary level

[4] See Madhya Pradesh Human Development Report, 1998.

enrolment during 1998-99 in Assam is higher than most other States, the gross enrolment ratio is considerably lower at the upper primary level indicating a high percentage of dropouts. One important reason for high dropout rate is the non-availability of educational facilities above the primary level in villages. A large percentage of the villages are still without an upper primary school. This especially accounts for a large chunk of girls dropping out after primary level. The parents are reluctant to send the girls to other villages for schooling, for fear of their security.

34. Literacy rate for the State has improved substantially between 1991 and 2001 (Table 4.20). The district wise performance in literacy shows wide variations in performance. Not only has there been an overall reduction in illiteracy but there has also been a substantial reduction in regional disparities in literacy (Figures 4.7a and 4.7b). The gender gap in literacy however persists. The role of literacy in bringing about a demographic transition and better health outcomes is well recognized in the literature.

Table 4.17: Percentage population age 6-17 years attending school, 1998-99

State	Male			Female			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
India	83.0	75.8	77.6	80.0	61.7	66.2	69.0	69.0	72.1
Arunachal Pradesh	96.7	82.3	84.2	87.3	74.3	75.9	92.2	78.3	80.1
Assam	86.8	73.3	74.2	81.1	69.0	69.9	83.8	71.2	72.1
Manipur	91.8	87.3	89.1	89.3	82.0	84.4	90.5	84.7	86.6
Meghalaya	91.4	75.3	78.5	91.3	76.8	79.9	91.3	76.0	79.2
Mizoram	92.6	78.6	85.5	89.3	79.9	85.3	91.0	79.2	85.4
Nagaland	87.3	84.5	85.1	89.8	78.0	79.4	86.0	81.1	82.2
Sikkim	88.0	82.7	83.2	84.8	83.6	82.6	80.6	83.2	82.9
Kerala	95.6	89.7	91.0	94.5	89.8	90.8	95.0	89.8	90.9

Source: NFHS-2, Table 2.9

Table 4.18: Percentage distribution of population across different levels of educational attainment, 1998-99

State	Illiterate	Literate, Primary School Complete	Primary School Complete	Middle School Complete, Male	High School Complete	Higher Secondary Complete and above	Median Number of years of Schooling
Male							
India	**25.5**	**21.1**	**18.4**	**13.0**	**10.7**	**11.2**	**5.5**
Arunachal Pradesh	27.0	26.6	16.5	13.2	7.4	9.2	4.4
Assam	**25.4**	**27.2**	**15.7**	**15.8**	**6.9**	**8.9**	**4.7**
Manipur	20.3	15.0	14.7	20.5	12.3	17.3	8.0
Meghalaya	28.3	35.1	14.0	11.2	5.5	5.8	3.2
Mizoram	6.4	31.9	24.4	19.7	7.6	9.9	6.4
Nagaland	19.4	27.6	20.3	15.3	8.7	8.5	5.4
Sikkim	20.7	32.0	20.2	11.2	7.2	8.6	4.7
Kerala	**7.2**	**18.4**	**23.4**	**17.4**	**21.2**	**12.4**	**8.1**
Female							
India	**48.6**	**17.1**	**14.5**	**8.1**	**6.0**	**5.6**	**1.6**
Arunachal Pradesh	43.0	22.0	14.5	11.3	5.2	4.0	2.1
Assam	**40.9**	**24.0**	**12.5**	**13.7**	**4.9**	**3.8**	**2.5**
Manipur	41.3	13.1	11.6	15.5	7.4	11.0	4.3
Meghalaya	33.2	35.9	13.0	9.4	4.6	3.9	2.3
Mizoram	10.6	36.3	21.7	17.9	7.5	6.0	5.5
Nagaland	31.7	26.3	19.1	13.2	5.4	4.3	3.7
Sikkim	35.6	26.4	18.0	10.3	5.2	4.5	3.3
Kerala	**14.9**	**16.9**	**21.4**	**16.0**	**18.5**	**12.3**	**4.5**

Source: NFHS-2, Table 2.8

Notes: Illiterate means persons cannot read and write. Primary school complete means 5-7 completed years of education. Middle school complete means 8-9 completed years of education. High School complete means 10-11 completed years of education. Higher secondary complete and above means 12 or more completed years of education.

Table 4.19: Gross Enrolment Ratio for Major States- 1998-99

	Primary (I-V)			Upper Primary (VI-VIII)		
	Boys	Girls	Total	Boys	Girls	Total
Andhra Pradesh	99.20	94.50	96.89	50.86	40.93	46.03
Assam	118.78	100.16	109.63	69.41	52.42	61.12
Bihar	93.20	61.51	78.02	42.43	23.13	33.55
Gujarat	122.92	100.70	112.22	72.06	58.00	65.39
Haryana	82.25	84.05	83.09	67.17	61.09	64.37
Karnataka	111.35	104.38	107.90	70.94	61.06	66.08
Kerala	88.69	87.00	87.86	97.15	93.24	95.22
Madhya Pradesh	119.58	96.46	108.35	75.03	48.09	62.25
Maharashtra	114.38	111.01	112.74	89.28	83.29	86.40
Orissa	109.53	79.82	94.91	64.79	37.43	51.31
Punjab	81.33	84.16	82.66	67.29	65.02	66.22
Rajasthan	125.52	75.68	101.82	78.57	33.60	57.56
Tamil Nadu	109.47	107.10	108.31	97.67	87.94	92.91
Uttar Pradesh	75.97	49.31	63.35	48.88	26.41	38.57
West Bengal	100.06	87.01	93.66	56.99	43.60	50.50
All India	100.86	82.85	92.14	65.27	498.08	57.58

Sources: Economic Survey, 2001-2002, Table 10.7, Page 197.

Table 4.20. District-wise literacy in Assam (Per cent)

	Literacy Rate					
	1991			2001		
	Persons	Males	Females	Persons	Males	Females
Assam	52.89	61.87	43.03	64.28	71.93	56.03
Kokrajhar	40.47	49.46	30.83	52.55	61.9	42.65
Dhubri	38.36	47.38	28.79	49.86	56.61	42.64
Goalpara	46.81	55.47	37.58	58.56	65.36	51.4
Bongaigaon	49.06	58.67	38.72	60.27	68.81	51.16
Barpeta	43.24	52.61	33.2	57.35	65.95	48.16
Kamrup	65.04	73.67	55.01	74.69	81.24	67.31
Nalbari	55.99	66.95	44.19	68.08	77.12	58.4
Darrang	42	50.8	32.53	55.92	64.32	46.95
Marigaon	47.99	56.17	39.19	59.46	66.13	52.36
Nagaon	54.74	62.49	46.3	62.28	68.52	55.57
Sonitpur	48.14	56.7	38.6	60.29	67.64	52.43
Lakhimpur	58.96	68.28	48.85	69.59	78.26	60.47
Dhemaji	53.84	65.43	41.12	65.96	75.15	56.11
Tinsukia	50.28	59.27	39.99	63.28	72.16	53.4
Dibrugarh	58.32	66.72	48.89	71.21	79.58	62.1
Sibsagar	64.46	71.91	56.14	75.33	82.08	68
Jorhat	65.51	73.29	56.88	77.91	82.76	72.54
Golaghat	58.54	66.5	49.75	70.36	78.01	62.07
Karbi Anglong	45.57	55.55	34.35	58.83	68.11	48.65
North Cachar Hills	57.76	66.39	47.34	68.59	76.59	59.4
Cachar	59.19	68.79	48.76	68.42	76.51	59.85
Karimganj	54.71	64.05	44.76	67.21	73.87	60.09
Hailakandi	53.07	64.08	41.04	59.84	68.47	50.65
Coefficient of variation	0.14889	0.12457	0.18790	0.11493	0.09819	0.14035

35. Surveys indicate that the majority of school dropouts belong to the poorest and the least developed areas. They are usually from SC/ST communities, backward rural areas and urban slums. The factors responsible for dropouts range from economic to cultural reasons. Children are pulled out of school due to economic reasons- they have to earn livelihood for their family. Lack of access to a school in the vicinity of their home is another reason why children dropout. Gender discrimination against girl child is a major cultural issue. Since girls are made to do domestic chores they are left with very little time for learning. The absence of women teachers in the village schools and the lack of separate toilet facilities for girls are other factors, which keep girls away from school. Also high teacher absenteeism and poor quality teaching does not motivate children to remain in schools. It is very important to tackle the problem of dropouts in order to achieve universal elementary education. The classroom experience needs to be made enjoyable to the children by using modern and interesting teaching materials. Community participation in the management of schools needs to be encouraged in order to reduce teacher absenteeism and improve the overall quality of education.

36. With the objective of supplementing access to schools and of providing exclusive and easy social access to Muslim children especially girls, alternative schools sponsored by the District Primary Education Programme (DPEP) have been opened at the Maktabs to which these children are religiously bound to attend. Since each Muslim habitation has its own Maktab, it is easy to open the Alternative School at the Maktabs, depending on the number of out-of-school Muslim children. According to the programme proposals, the Maktabs with 25 out-of-school Muslim children including 15 minimum female children and with matriculate Janabs will be converted into Alternative Schools.

37. The Mid-day Meal programmes started by certain States provided some motivation for children, especially those from poorer background to attend school. The National Programme of Nutritional Support to Primary Education was launched in 1995 in order to consolidate earlier efforts to provide the Mid-day Meal in primary schools to supplement nutrition for children in the age group 5-9 years. By doing so it was hoped school enrolment would increase and drop out rate would decline. A nation-wide Mid-day Meal programme was launched from August 15, 1995 to give a boost to universalization of elementary education by improving enrolment, retention and attendance in primary schools and also to improve the nutritional status of children. Under the scheme, foodgrains at the rate of three kg per child are provided per month subject to a minimum attendance of 80 per cent. Central Government supplies free of cost the full requirement of foodgrains for the programme. As an incentive to facilitate the movement of foodgrains to villages, the Central government has even decided to reimburse the actual transportation charges for moving foodgrains from Food Corporation of India godowns to schools/villages under the Scheme. The success of this programme however is limited.

4.3.2.1. Reasons for inefficiencies

38. The poor performance as seen from the various indicators is despite the fact that the percentage of SDP devoted to education and per capita public expenditure on education have been consistently higher than the corresponding all India averages (Figures 4.8 and 4.9). The pattern of distribution of expenditure across different sub sectors, primary, secondary, university etc is not very different from other States. A major share of education expenditure goes to elementary education followed by secondary and higher education. Given that the social returns on elementary education are high, a larger share in public expenditure is justified. In spite of a high share in expenditure physical infrastructure facilities are found to be poor. A high percentage of schools lack facilities such as all weather usable rooms, drinking water and separate toilets and common rooms for girls. The percentage of untrained teachers is also quite high, 40 per cent in the case of primary and 70-80 per cent in the case of secondary/higher secondary schools.

39. There are also problems with the implementation of the nation wide Mid-day Meal scheme. According to the Comptroller & Auditor General of India Report, the National Programme of Nutritional Support to Primary Education, failed to realize its primary objective of improving the nutritional status of the students as well as the secondary objectives of promoting the universalisation of primary education. It has also failed in reducing the percentage of school dropouts. Financial constraints both at the Central and state level led to inadequate coverage and the "complex administrative arrangement" led to "considerable leakages between the FCI godowns and the primary school". Even in the food-surplus States of Punjab and Haryana the scheme is being discontinued due to financial constraints. While there is no cash involved in getting the wheat from the FCI as it is a department-to-department transaction, the District Education Officer has to collect the carriage charges to transport the wheat to various primary schools. The distribution is left to the schoolteachers. The teachers, however, want to be disassociated from the scheme since they are made to transport wheat to their schools at their own cost. This additional responsibility also affected their teaching work.

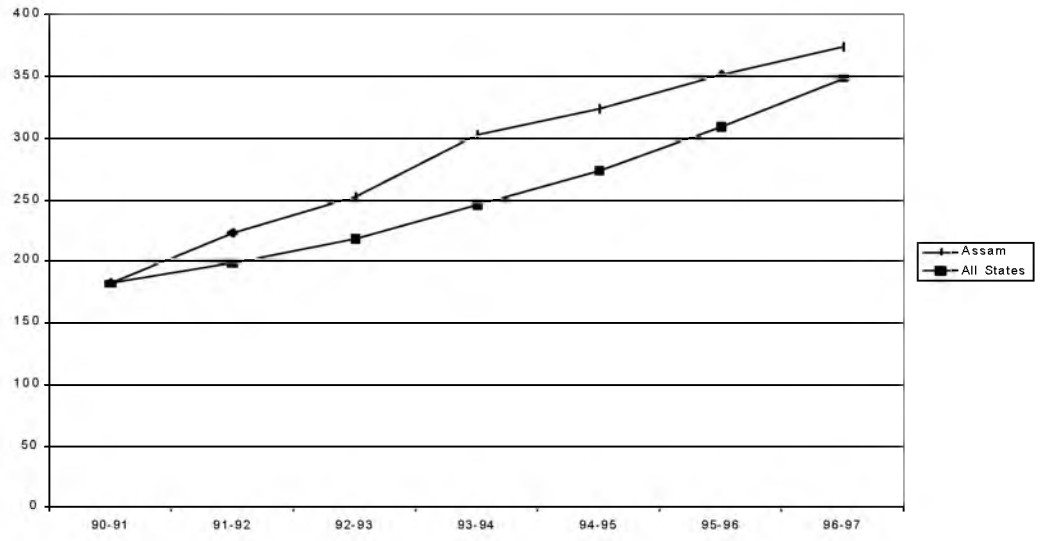

Figure 4.8: Per capita revenue expenditure on education

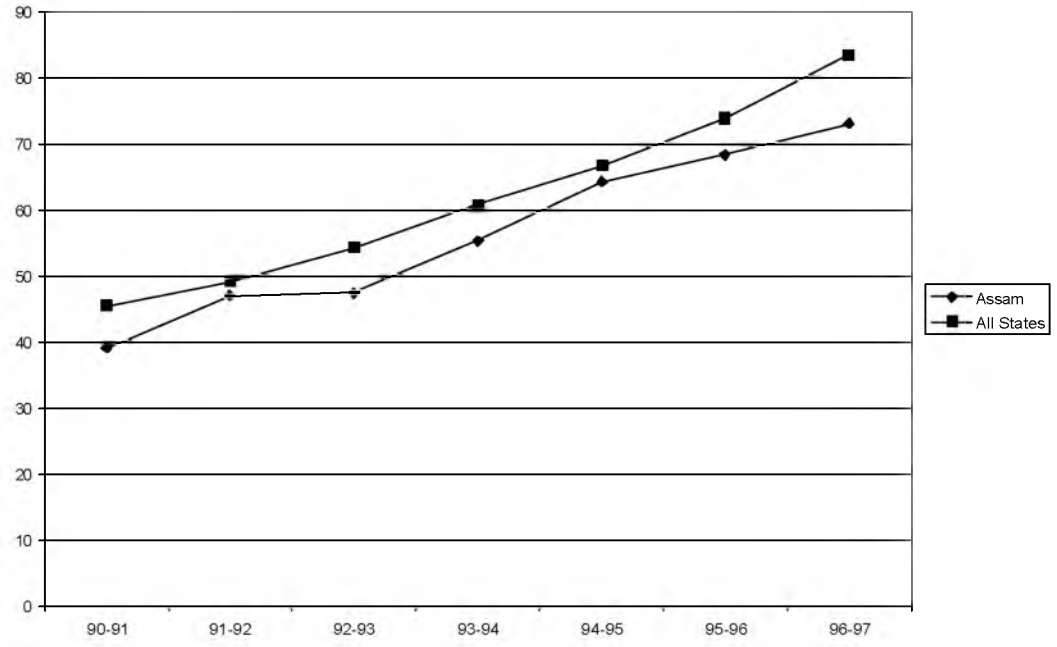

Figure 4.9: Per capita revenue expenditure on health

40. The Planning Commission's monitoring and evaluation study assessing the impact of DPEP intervention of Maktab Alternative Schooling on access, infrastructural enrolment and retention situations in Darrang, Dhubri and Morigaon districts revealed the following. "The DPEP strategy of Alternative Schooling through Maktabs, to a certain extent, has been successful in providing additional access, enrolment and retention". "In terms of enrolment and retention, the sample Maktabs have been able to induct a large number of out-of-school Muslim children especially girls. The retention of these children however has been of relative success because of their higher age and difficult domestic situation."

4.3.2.2. Areas of action

41. In order to achieve the goal of universalization of elementary education, concerted efforts have to be made with a greater focus on school dropouts, working children, girls who cannot attend formal schools, particularly those belonging to SCs/STs and other disadvantaged groups. Special attention has to be given for removal of caste, sectional, regional and gender disparities.

42. The Mid-day Meal scheme should be targeted at these focus groups. Currently the scheme does not serve its purpose well because it encompasses all children of primary schools, irrespective of their economic backgrounds producing strain on the state budget. In order to avoid the administrative burden falling on the educational system foodgrains could be distributed free of cost to the focus groups through the regular fair price shops of the Public Distribution System.

43. In both the education and health sectors the quality of governance needs to be improved. The decentralization of administration has to be strengthened. It has been observed that funds allocated to the lower level bodies were not being released to them.

44. Given that there is wide gap to be bridged in terms of achievements in education compared to several other states or the all India average and given the financial resource constraint Assam indeed faces a major challenge in fostering the human capital accumulation of the poor.

45. There is no doubt that poverty is a major stumbling block to higher educational attainment. Though school-feeding programs encourage children's participation in schooling this alone may not suffice. Quality of education needs to be improved to prevent children from dropping out and increase school completion rates. As has been noted in the World Development Report (2001) subsidies can be used to close gender gaps in education. Experience from several countries suggests that subsidizing various expenses for girls has increased their enrolment rate. The access of the poor to education can be improved through geographic targeting. That is location of schools in rural and remote areas where most of the poor live.

46. Some States have made reforms in this direction and Assam could follow these examples. For instance, the State governments in MP, Rajasthan and UP are adopting more efflcient methods of expenditure control. They are trying to outsource funds, by contracting out work such as replacing government teachers with "shiksha karmis" (para teachers). Preliminary evidence from some tribal villages [Sharma (1999)] suggests that appointment of a local shiksha karmi as teacher tremendously improved the quality of education.[5] The karmi was devoted, committed and motivated to educating the children of the community, was regular and punctual, did not face the language problem and worked for a lower salary, unlike a city-based teacher coming to the school. Resources saved from such expenditure control can be spent on modern learning materials, etc to improve quality.

47. The Education Guarantee Scheme (EGS) promoted in 1997 in Madhya Pradesh, for example, has been responsible for providing a primary education facility within one kilometre of every inhabitation. Under this scheme, the Madhya Pradesh government guaranteed the provision of a teacher, his/her salary, learning material and contingencies to start a school within ninety days wherever there was a demand from a community without a primary schooling facility within one kilometre. This is an effort at community-centred and rights-based education to provide primary education to all children in a quick and time-bound manner. EGS operates on a decentralized basis through collaboration of the State government, local body/panchayat and the community. The community raises demand, identifies a local resident to be a teacher and provides a startup space for school. The Panchayat appoints the teacher and oversees the functioning of the school. The State government supports the school through grant for teacher's salary, teacher's training, etc. The EGS school bypasses the major abuses of the formal government school system. The EGS teacher is accountable to the local community unlike the government teachers who are unionized, powerful and are accountable only to the distant State government. The *Shiksha Lehar* in Haryana is another programme involving the local community. It is one of the programmes initiated by government agencies, NGOs and UN agencies using a decentralised approach.

48. Given the resource constraint, more innovative measures would be needed in cost recovery and raising of resources for education. There is a lot of scope for cost recovery in higher education. The fee structure should reflect the cost of provision of education. It should at least recover the long run marginal cost. The poorer and deserving sections can be protected through a system of scholarships or subsidized loans. Private financing and provision of higher education needs to be encouraged simultaneously. There is a lot of scope in making technical education self financed. Engineering colleges and polytechnics can generate funds by providing consultancy services to industry and trade. There is also a need for greater

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[5] Sharma, R., 1999, What manner of teacher? Some lessons from Madhya Pradesh, Economic and Political Weekly, June 19, 1597-1607.

emphasis on vocational education so that the prospects for self-employment and wage employment are increased and students would be willing to pay higher fees.

49. Some of these problems are common to many States in India and are not exclusive to Assam. However, the sorry state of finances of the government of Assam indicates that there is a need to tackle these problems with utmost urgency.

4.4. Summary and concluding remarks

50. We note that poverty in Assam is predominantly a rural phenomenon with close to 90 per cent of the population being rural. Rural poverty is more than twice that of urban poverty. Urban poverty in Assam is much lower than all India urban poverty whereas rural poverty is at a similar level as all India. Whereas urban poverty decreased steadily rural poverty showed fluctuations with very little decrease over the years. The population growth in Assam also implied that there has hardly been any reduction in the absolute number of the poor over the years. The main reasons for poor performance in terms of rural poverty is the continuously declining real wages of non-skilled agricultural labour and increasing unemployment among the youth. Growth of the rural economy is therefore the key to poverty reduction in Assam.

51. Information regarding who and where are the poor is important to target the poor through appropriate programs and make the best out of limited resources. Regional dimensions (NSS regions) of poverty indicate that the western plain region of Assam is the poorest. Incidence of rural poverty is the highest among agricultural labour and least among self-employed in non-agriculture. Urban poverty is the highest among casual labour. Large proportions of the rural poor belong to the agricultural labour and self-employed in agriculture groups. The self-employed in the non-agricultural section form the largest proportion of the urban poor. Incidence of poverty among SC/STs is higher than the general level of incidence. More than 40 per cent of the poor are SC/STs.

52. Assam's achievements, in health and education are mostly below or at par with all India levels and well below the levels achieved in Kerala. Assam ranks 12th among 16 States in terms of Human and Gender development indices. Public expenditure on health and education as a percentage of SDP is higher than the average for all states and increasing. Per capita expenditure on education is higher than the average for all States and increasing. Per capita health expenditure is lower that the all-State average but increasing. Poverty exists not so much due to expenditure shortfall as due to inefficient expenditure management. A large percentage of expenditure is unproductive, going to wages and salaries. There is a considerable overlap in development activities by different layers of government. Gap between plan outlay and utilization exists possibly due to the inability in mobilizing resources to meet the matching fund requirements for centrally sponsored programs.

53. The broad areas of action can be summarized below.

- Provide better education and health facilities to strengthen the capabilities of the poor and vulnerable groups to earn income.
- Focus on asset formation through employment generation programmes in order to achieve sustainable poverty reduction.
- Use geographic targeting to help the poor so that resources are not thinly spread and the quantum of subsidy is large enough to pull them out of poverty permanently.
- Provide better irrigation facilities and water management in order to encourage the self-employed in agriculture to diversify their activities and increase their incomes.
- Develop opportunities for non-farm employment by strengthening rural marketing infrastructure and deregulation of markets (removal of small-scale sector reservations and restrictions under the Essential Commodities Act).
- Encourage local community participation in decision making by strengthening the decentralization process through Panchayati Raj institutions.
- Use modern technology to overcome some of the existing infrastructural bottlenecks (e.g. cellular phones).
- Improve the social status of women through better access to education apart from improving health care services.
- Overcome resource constraints by introducing user charges for certain health services. Enhance household's ability to pay through risk sharing mechanisms such as insurance and other forms of social financing including employer health-based insurance schemes. Use health cards (similar to ration cards) to protect the poor.
- Achieve universal elementary education by giving special attention to remove various kinds of disparities - caste, gender and regional. Provide special subsidies, for example, to girl children to close gender gaps in education.
- Remove the administrative burden of Mid-day Meal scheme on the educational system by providing free of cost additional foodgrain quota for school going children, through the regular Public Distribution System.
- Use innovative measures such as the Education Guarantee Scheme of the Madhya Pradesh government to reduce costs of schooling and increase accountability of teachers.
- Exploit potential for cost recovery in higher education.

54. In short, steps need to be taken to increase the effectiveness of service delivery; to encourage decentralization for better accountability and governance; to improve quality of public service provision through innovative means; to recover costs of service provision to the

maximum extent possible; to reduce establishment costs and administrative overheads; and to transfer expenditure authority to local bodies who are directly responsible and accountable to the local people.

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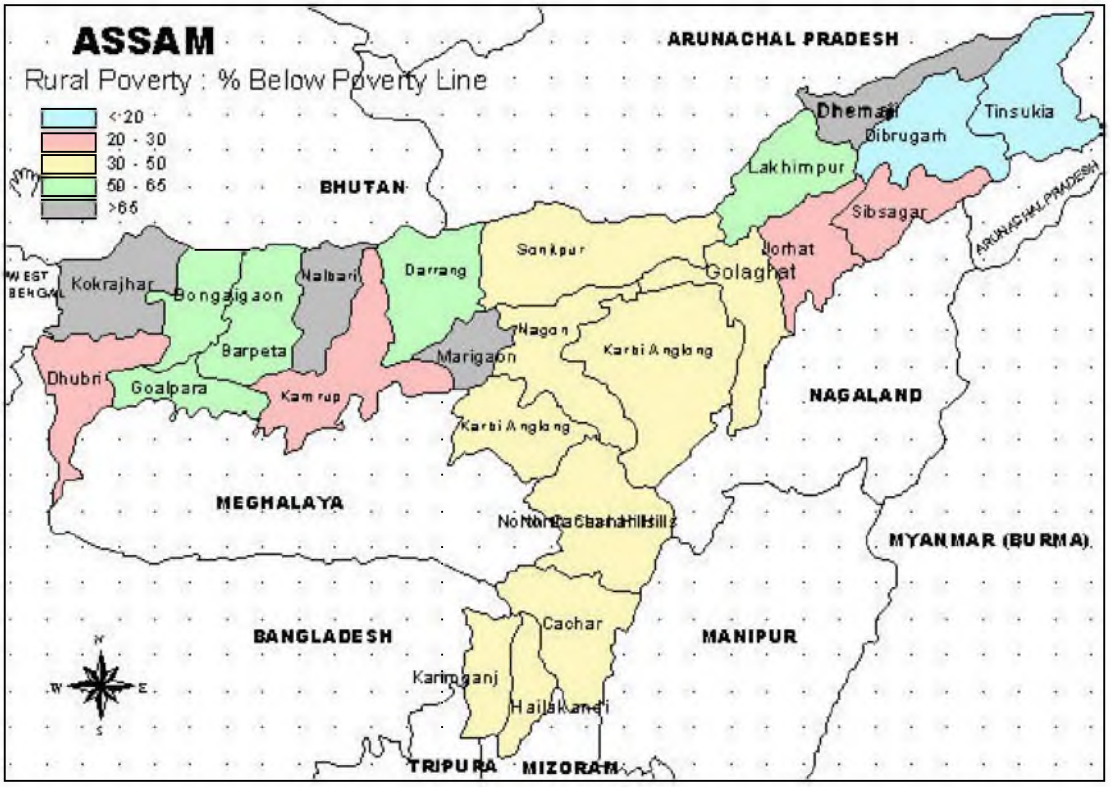

Figure 4.3a: Rural Poverty: Percent Below Poverty line

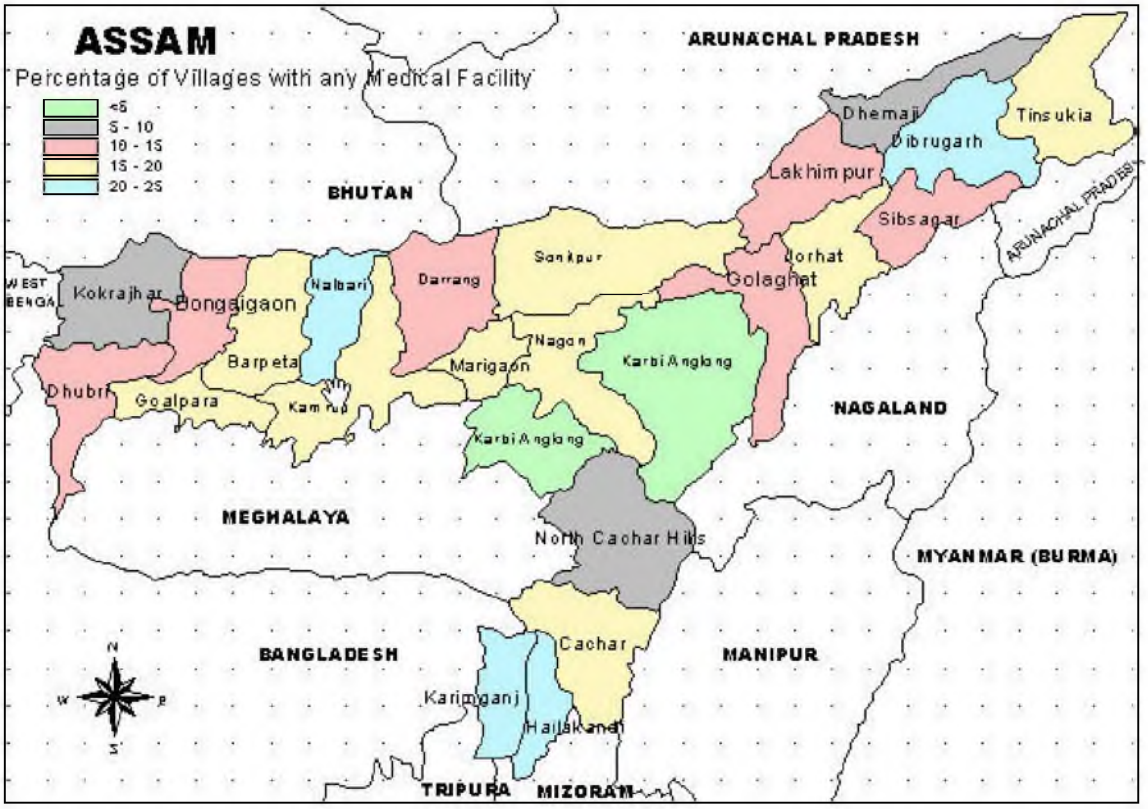

Figure 4.3b: Percentage of villages with any medical facilty

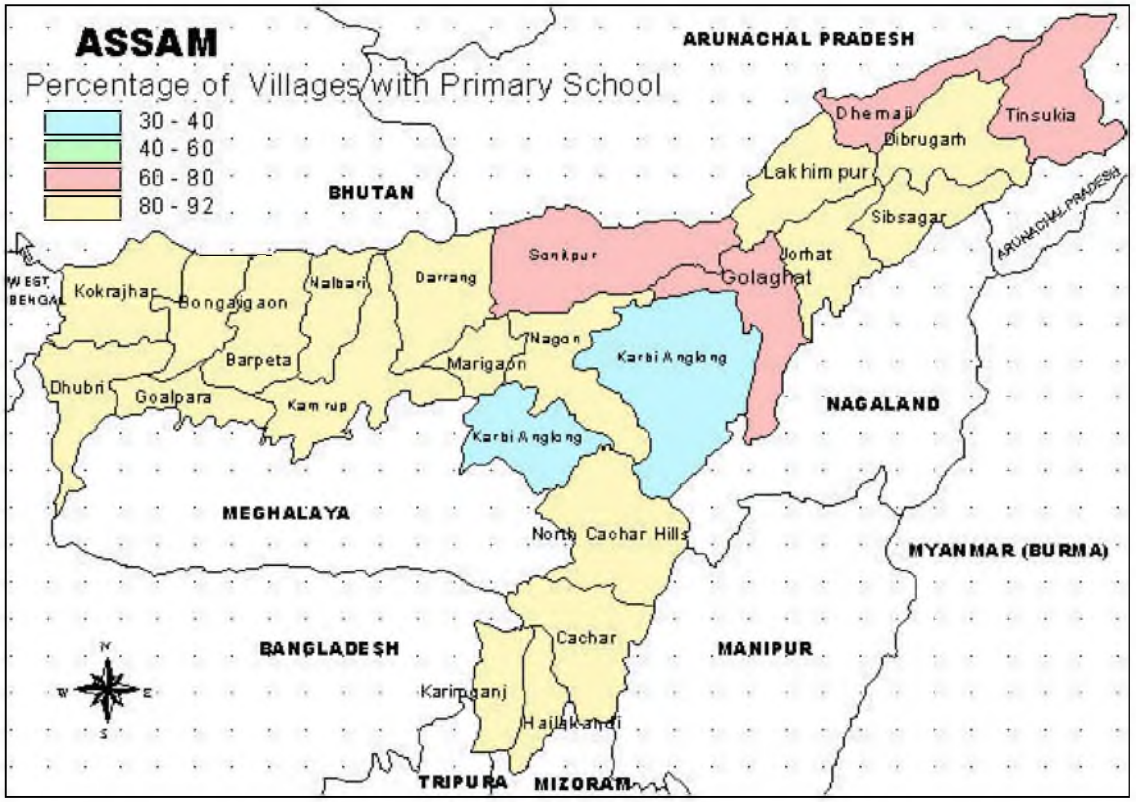

Figure 4.3c: Percentage of villages with primary school

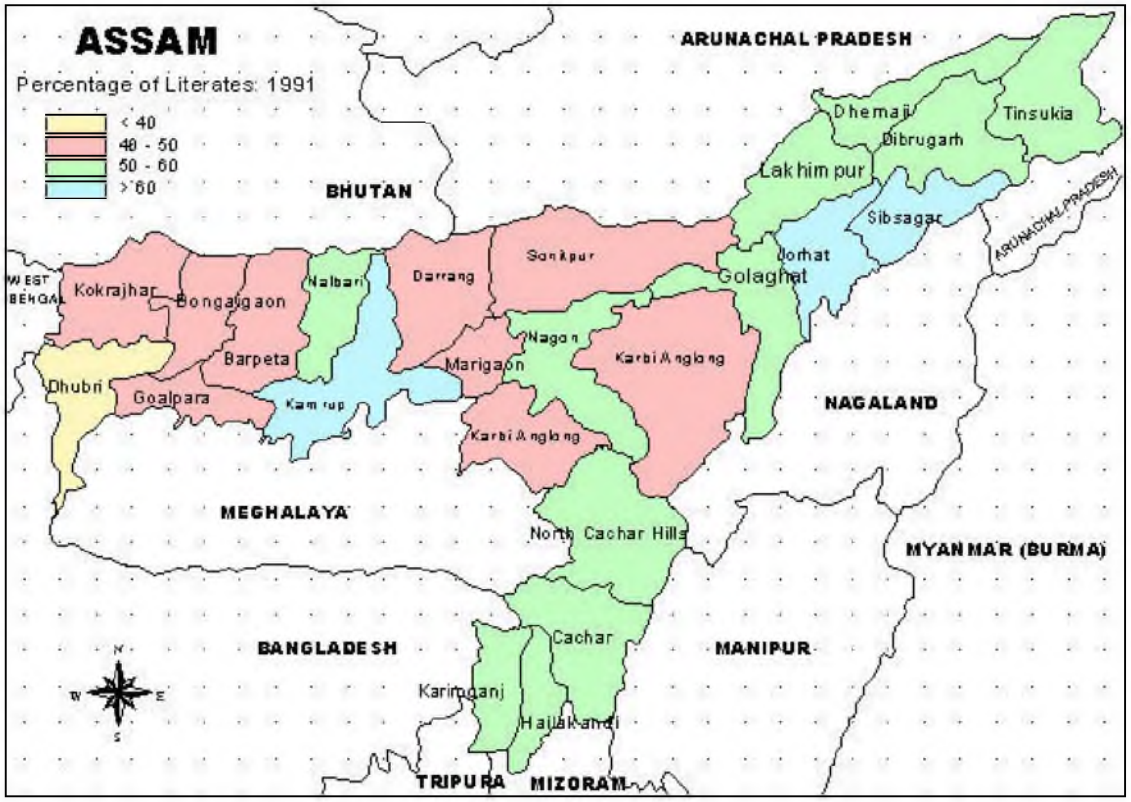

Figure 4.7a : Percentage of Literates: 1991

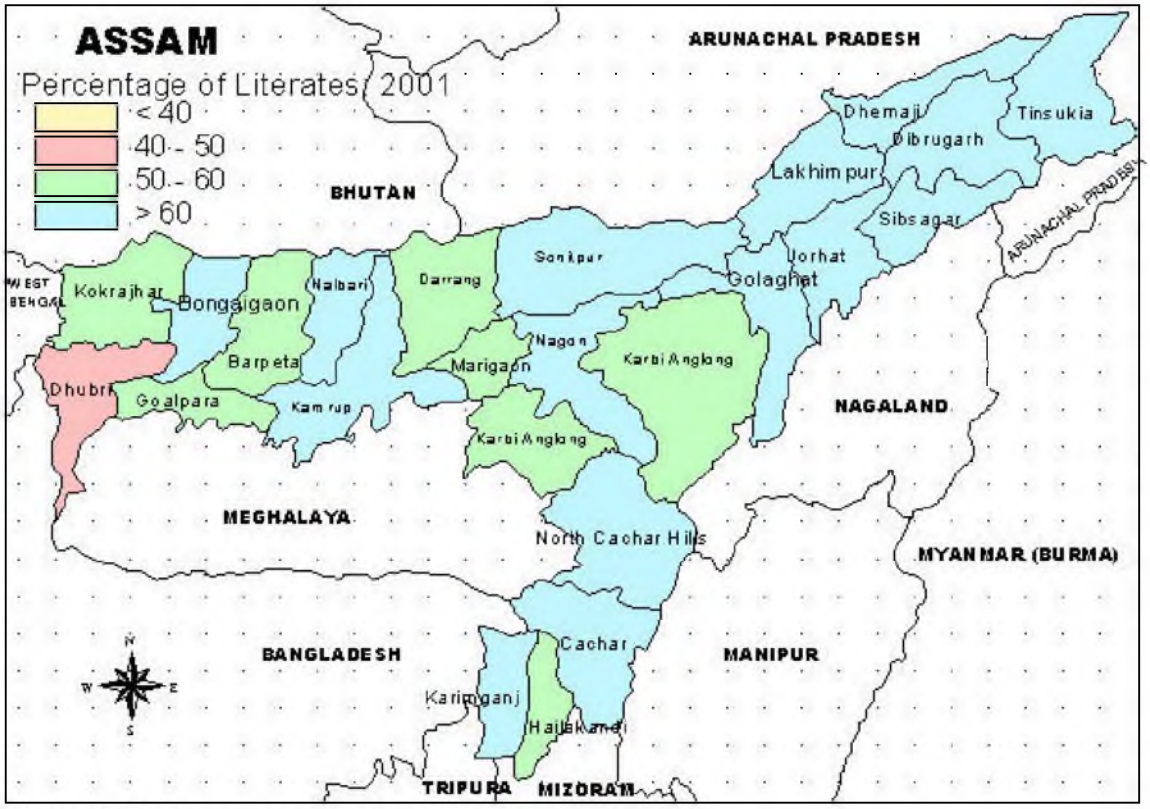

Figure 4.7b: Percentage of Literates 2001

5 Infrastructure and Industries

5.1. Infrastructure is Critical

1. The disruption of partition not only increased transport costs but it also dislocated the traditional markets of the North-East. It also increased transactions cost and reduced access to finance. The transport disruption was all around. The road distance to rest of India increased, connectivity through waterways became poor, and loss of access to the port of Chittagong meant international markets also became less accessible. Coupled with these, poor power sector development and difficulties of getting flnancial credit have also contributed to poor development of industries in Assam. We look at the status of infrastructure development in Assam.
2. At various stages the Central government has recognized the need to pay special attention to infrastructure development in the North-East. A number of initiatives were taken in the 1990s. A committee was constituted in February 1990 under the chairmanship of L C Jain, Member of the Planning Commission. A high level commission was set up under the chairmanship of S P Shukla in 1997 to tackle the problem of backlog in basic minimum services and infrastructure needs of the North-East. The recommendations of these committees were reflected in programmes announced by various Prime Ministers. Thus, an economic package of Rs 6100 crore for specific projects in NE states as announced in October 1996 by the then Prime Minister H.D.Deve Gowda included fourth rail-cum-road bridge over the Brahmaputra at Bogibeel, upgradation of Guwahati airports and a few industrial growth centres in addition to some road projects, drinking water supply schemes and health care programmes. He also introduced the North-East sub-plans in all Central Ministries for which 10 per cent of their budgets would be earmarked.

3. Mr I K Gujaral who followed Mr Deve Gowda as Prime Minister also assured the implementation of the package in toto. In January 2000, Mr Atal Behari Vajpayee further announced Rs 10,271.66 crore package for the region[1].

What has been the impact of these programmes? What is the state of infrastructure in Assam?

5.2. Roads

4. The road network in Assam is extensive in terms of road density, that is, road length per thousand sq km, of all roads. However, in terms of density of surfaced road Assam is way behind India and the gap is increasing (See Table 5.1). However, the density of national highways is higher in Assam and more have been added in recent years. This would imply that the state government has invested on extending the road network rather than on

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[1] The breakdown of the funding pattern: Central Plan including funds from financial institutions/multi-lateral funding agencies: Rs 7,663.42; Central non-plan: Rs 1,800 crore; North Eastern Council: Rs 258.24 crore and Banks (NABARDSNEDFI: 550.00 crore.

Proposal included were:

- Provision for Rural Infrastructure Development Fund Rs 550 crore -(NABARD)
- NEDFi's disbursement Rs 50 crore
- Setting up Export Development Fund Rs 5 crore- (Central Fund)
- Development of four border township Rs 20 crore- (Central Plan)
- Upgradation of NEIGRIHMS Rs 422.60 crore- (Central Plan)
- Setting up of Mizoram university Rs 25 crore- (Central Plan)
- Doubling of it is Rs 101.39 crore- (Central Plan)
- Modernization of police force Rs 40 crore- (Central Plan)
- Sanction of three Reserve Battalion Rs 40 crore
- Peace Bonus Rs 230 crore- (Central non-plan/Plan)
- Fencing of Indo-Bangladesh border Rs 1,335 crore- (Central non-Plan)
- Yearly allocation from Central non-lapsable pool Rs 500 crore- (Central Plan)
- Loktak downstream project Rs 578 crore- (Central Plan+FIs)
- Teesta hydro-electric power project Rs 2198.04 crore- (Central Plan+FIs)
- Subansiri lower project Rs 3000 crore- (Central Plan)
- Rural electrification Rs 30 crore- (Central Plan)
- Add assistance for critical/subcritical transmission system Rs 239.92 crore-
- Eight road/bridge project Rs 258.24 crore- (NEC)
- Development of 12 new national highways Rs 100 crore- (Central Plan)
- Computer Information Centres (447 blocks) Rs 220 crore- (Central Plan)
- Excise concession to Numaligarh Refinery Rs 200 crore- (Central non-Plan)
- Technology Mission for horticulture Rs 262.50 crore- (Central Plan)
- Development of Bodo Autonomous Council Rs 90 crore- (Central Plan)

improving the quality of roads. Recent improvement and initiation of new projects will add even more national highways (See Table 5.1). Yet all weather roads connecting villages remain inadequate. With emphasis on new roads, inadequate attention is paid to maintenance of existing roads. Many roads are in poor state and all weather connectivity for many villages is limited. With poor connectivity farmers get lower price for their produce while urban consumers pay a higher price.

Table 5.1: Roads in Assam and India

	Road Length ('000 Km)			**Road Density (Km per '000 Sq Km)**		
Year	**Surfaced Road**	**Unsurfaced Road**	**Total**	**Surfaced Road**	**Unsurfaced Road**	**Total**
All India						
1970-71	398	520	918	121	158	279
1980-81	684	802	1486	208	244	452
1990-91	1025	977	2002	312	297	609
1996-97	1394	1072	2466	424	326	750
Assam						
1970-71						
1980-81						
1990-91	10	55.6	65.5	127	709	836
1996-97	11.6	56.8	68.4	148	724	872

Source: CMIE: Infrastructure, Various Issues

5. For public transport, the Assam State Road Transport Corporation (ASRTC) was set up. Like other such public corporations in the country ASRTC is also overstaffed and financially sick. ASRTC has annual deficit of Rs 22.55 crore and accumulated liability of Rs 80 crore including 12 months of employee salaries of Rs 28 crore. The bus staff ratio is 1:40. The scheme formulated to restore it to health is yet to be implemented. It is thus unable to meet the growth needs of the people of Assam with quality service.
6. The progress or lack of it, in implementing the recommendation of different committees is shown in Table 5.2. We do see progress. The momentum generated should be maintained and villages should be connected with all weather roads.

Table 5.2: Roads: Recommendations of Different Committees

Recommended by	Recommendations	Status in April 2001
Jain Committee (April 1990)	1. Improve efficiency and economic viability of Assam State Road Transport Corporation (ASRTC).	No progress
S P Shukla Commission (March 1997)	2. Develop as National Highways a. Daboka-Silchar highway (290 km) b. Kohima-Amguri between Nagaland and Assam (241 km)	No objection for handing over land to center given by state on 9.3.99. Estimate was not sanctioned by GOI till 14.3.01
Prime Minister Vajpayee's announcement of January 22, 2000	3. Road Projects a. Baithalangsu-Raha (48 km) b. Naharkatia-Khonsa (57 km) c. Panchgram-Hailakhandi (58 km) d. Megherita-Changland (43 km) e. Zamuang-Durlavcherra (79 km) f. Jotte-Balijan (58 km) g. Fatikroy-Kailashwar (98 km)	Work initiated and is in various stages of completion.
	4. New National Highways totalling 1962 km in the NE of which 433 km is in Assam.	Declared as national Highways and consultancy quotations invited.

Source: Compiled by author from committee reports and data supplied by Government of Assam.

5.3. Railways

7. Similarly, the development of railways (see Table 5.3) took a long time to reach a reasonable level. At the time of Independence, the North-East was connected to the rest of the country by a metre gauge line laid by the British mainly to transport tea and other raw materials from Assam to Kolkata. This remained so till 1966. Transport by railways does not provide the timely delivery and assurance that trucking provides. Its relative cost advantage is often offset by cost of time and pilferage. When a trans-shipment is required from metre gauge to broad gauge (BG), both these costs increase. Conversion to broad gauge was begun in 1962 after the Chinese aggression but reached Guwahati 22 years later in 1984. It took 10 more years to reach Lumding. Things have changed in recent years as Dibrugarh is connected by BG, the Jogighopa bridge across Brahmaputra is commissioned in 1998-99 and further BG lines are under construction. At last the NE can hope to have regional rail connectivity. The recommendations of the Jain Committee and the Shukla Commission (see Table 5.4) have had impact. However, there is congestion on the Siliguri-Guwahati sections. It should be examined how to relieve it, expeditiously and economically either through double tracking or through building appropriate bypass loops, to increase line capacity and reduce transit time.

Table 5.3: Development of Railways in Assam

Year	Route Length		Density	
	All India	Assam	India	Assam
	(Km)		(Km/000 Sq Km)	
1990-91	62367	2467	19.0	31.4
1993-94	62462	3728		
1996-97	62725	2435		
1998-99	62809	2392	19.1	30.5

Source: CMIE: Infrastructure, Various Issues

Table 5.4: Railways: Recommendations of Different Committees

Recommended by	Recommendation	Status in April 2001
LC Jain Committee (April 1990)	1. Speed up and complete (a) Rail-cum-Road Bridge at Jogighopa	1a. Inaugurated in April 1998
	(b) BG line from Jogighopa to Guwahati which were taken up in 1983-84	1b. Completed Feb. 2001.
	2. BG line from Guwahati to Dibrugarh.	2. Most of it completed rest expected by end 2001.
	3. New BG line from Jhalukbari to Panikheti	3. No proposal for survey work
	4. Extension of BG track from Lanka to Silcher	4. Conversion work sanctioned in 1996-97
	5. A rail-cum-road bridge at Bogibil near Dibrugarh	5. Final location survey completed. Final clearance is awaited.
S P Shukla Commission (March 1997)	6. Expeditious completion of Bogibeel bridge	6. Final clearance awaited
	7. (a) Diphu-Karang and (b) Bairabi-Saireng lines be taken up in 9th plan.	7a. Survey completed by Mizoram has indicated preference for a new alignment. 7b. Survey work awarded for a proposed line but facing local opposition
	8. Overnight trains between Dimapur and Guwahati.	
	9. Linkage with Bangladesh	9. Survey on Indian side completed, awaiting Bangladesh report.
	10. Linkage with Myanmar.	10. No proposal.
Jain Committee	11. Establish a railway training institute.	

Source: Compiled by author from Committee reports and data supplied by Government of Assam.

8. The railways have not been able to compete profitably with the trucks as the latter are more reliable and prompt. Time is money for the transporters. A considerable difficulty linked to pilferage also takes away the price advantage enjoyed by the railways.
9. In a way, comparing road density or rail density of Assam and the North-East with all India figures is misleading. The mighty Brahmaputra runs through Assam dividing it into two parts. Bridges across Brahmaputra are extremely important for connectivity. And there are only three bridges today.

5.4. Inland Water Transport

10. The inland water transport network was disturbed by partition and further disrupted by the earthquake of 1950. A special chapter deals with the possibilities of reviving inland water transport. The river Brahmaputra was declared as a National Waterway No 2 by an Act of the Parliament in the year 1988. However, this declaration remains mostly on paper as very little significant and concrete work has been done by the Inland Waterways Authority of India (IWAI) for translating the intents into reality. The channel from Dhubri to Sadiya is 890 km long. The channel is functional and stable almost throughout the year except for two lean months in upper Assam. The main channel has depth of 10 to 40 metres and with width of 500 metres to 1.5 km. Even though we have come to the twenty-first century the entire stretch of the National Waterways No 2 remains without voyage, bundling and night navigational facilities. Therefore, the efficiency of the waterways has been reduced to half. In addition, there is no mechanized cargo-handling facility available in any of the ports, including Pandu port. This reduced operational efficiency and inaction on the part of the IWAI has added to the operation cost of water transport, making it almost unviable. A round trip from Kolkata to Pandu and back takes almost 50 days. It could have been very easily completed in 25 days with night navigational facilities and mechanized cargo-handling systems. In addition, the Brahmaputra has hardly any terminal with proper infrastructural facilities. The Inland Water Transport (IWT) directorate of government of Assam has commercial fieet with a total tonnage of 600 MT. Most of these vessels are now used for ferrying people at various points in the absence of demand for their utilization for carrying cargo.
11. The over-dimensional equipment for Numaligarh refinery which the railways could not have carried were transported by IWT Department of Government of Assam with remarkable efficiency and promptness. It shows the potential of river transport. In a later chapter, we recommend constitution of Brahmaputra Development Authority. This Authority should be funded by the Government of India as the State Government does not have funds to cater to the needs. The Inland Water Transport Directorate has a strong infrastructure with good cargo carrying facilities as well as trained manpower. They have adequate training facilities

also. Over the years, they have gained experience in plying vessels over the Brahmaputra in various seasons in the year. Therefore, the IWT Directorate should be able to expand its activities in the commercial area and in carrying cargo to and from the State via Waterway No 2. Since it is a national waterway, the Government of India should make the needed investment to provide the basic terminal or landing facilities all along the Brahmaputra. The cargo handling facilities have to be put in proper place, warehouses set up at proper locations, night navigation introduced, channel marking done and dredging operations carried out, especially, during the lean season.

12. With proper investment the Brahmaputra could be converted from a river of floods to a river of prosperity.

5.5. Civil Aviation

13. Air connectivity is vital for a modern economy. To develop tourism, it is a must. There were many World War II airstrips in the North-East which have been allowed to degrade. Under the package announced by the Prime Minister on October 27, 1996 at Guwahati a number of improvements have taken place. Guwahati's Gopinath Bordoloi airport has been upgraded to international standards. International flight traffic needs to be developed now. There is, however, some progress as new airports are being built in the North-East and some old ones are being improved. Also central subsidy of 75 per cent is offered for helicopter services on some routes.

14. Under the package announced by Prime Minister Vajpayee at Shillong on January 22, 2000, fuel price and tax concession are offered to encourage internal air services within the North-East. Thus a signiflcant improvement is likely. Still the recommendation of Shukla Commission to make Guwahati a regional hub for Indian Airlines to ensure more timely regular flights to Kolkata is important. It should be possible to go to Kolkata and return the same evening. A long-term plan for air-connectivity of the North-East needs to be evolved.

5.6. Power

15. Electricity consumption per capita in Assam is one of the lowest in the country. Tables 5.5 and 5.6 show the growth of electricity supply and consumption in Assam. The per capita electricity supplied is a mere 116 kwhr/person/year. This is only one fourth of the all India per capita generation of 479 kwhr and one hundredth of per capita consumption in the United States which exceeds 12000 kwhr. The gap is large and is so in spite of large resources in

Assam and the North-East. The abysmally low per capita consumption of electricity reflects both poor quality of life and low level of economic activities.

Table 5.5: Power Capacity and Electricity Supply

Year	Generation Capacity	Generation	Purchased	Total supply
	(M.W.)	(M.U.)	(M.U.)	(M.U.)
1980-81	151.5	464.7	374.2	839
1990-91	514.4	1206.5	996.5	2203
1997-98	574.4	1032.7	1888.7	2921

Source: CMIE: Infrastructure reports, VariousIssues

Table 5.6: Electricity per person per year (Kwhr)

Year	Assam	India	USA
1980-81	47	175	8380
1990-91	98	342	12060
1996-97	116	479	12980

Source: Statistical Handbook Assam 1999; Directorate of Economics and Statistics, Government of Assam, Guwahati

16. The power scenario is uncertain. Today, Assam State Electricity Board's (ASEB) installed capacity is about 575 MW and with the state share of about 350 Mw in central generating stations of North-East region, the total capacity works out to about 925 MW. With the commissioning of 405 MW Ranganadi Hydro Electric Power Project in the near future and its share of about 105 MW in this, Assam's capacity is expected to touch about 1050 MW. Assam's unrestricted peak demand of about 650-700 MW should logically give zero energy and peaking shortage. However, unless pilferage is arrested and the liquidity, solvency and escrow-ability of ASEB improves to buy power from UEEPCO, NTPC, MSEB, etc. and improvements are made in the very poor quality of T&D system, inadequate transformation capacity, insufficient capacitor banks and high density of low tension (LT) lines vis-a-vis high tension (HT) lines it may not be possible to supply quality power at competitive rates to the consumers. If all the projects that were under implementation in March 1996 (see Table 5.7) were to be completed, the NE would have a total installed generating capacity of 3396 MW, enough to meet its demand for some years.

Table 5.7: Project Under Implementation in 1996

Project	Raw Material	Cost (Rs cr.)	Capacity (MW)	Ownership	Status
Ranganadi (Aru)	Hydel	774	405	Neepco* (Central Govt.)	Under Implementation
Kharsang (Aru)	Gas	232	48	Intercorp ind. (pvt., foreign)	Under Implementation
Kemeng (Aru)	Hydel	1300	600	Intercorp ind. (pvt., foreign)	Under Implementation
Kathalguri (Ass)	Gas	1347	291	Neepco (Central Govt.)	Under Implementation
Kopili (Ass)	Hydel	111	100	Neepco (Central Govt.)	Under Implementation
Adamtilla (Ass)	Gas	52	9	DLF Power Co. (Pvt. Ind)	Under Implementation
Karbi Langpi (Ass)	Hydel	190	100	ASEB+Subhash Projects	Under Implementation
Loktak (Man)	Hydel	315	90	NHPC! (State Govt.)	Under Implementation
Doyang (Nag)	Hydel	331	75	Neepco (Central Govt.)	Under Implementation
Agartala (Tri)	Gas	294	84	Neepco (State Govt.)	Under Implementation

* North Eastern Electric Power Corporation; National Hydro-electric Power Corporation.

Source: Sachdeva (2000), p.221.

17. Assam's power sector is riddled with a hydel thermal imbalance as 100 per cent of the state's power generation capacity is thermal; plant load factor (PLF) is 18 per cent (as the 60MW Chandrapur Thermal Power Station has been closed down due to high price of fuels; the 240 MW Bongaigaon Thermal Power Station hardly generates due to poor coal linkage and abinito structural problems in turbo-generators and the Lakowa TPS suffers from inadequate quantity and pressure of gas. This is further compounded by the steep load curve of Assam where the peaking load is twice the non-peaking load due to high domestic demand; T&D loss is a staggering 50 per cent; peaking shortage is 12.5 per cent; energy shortage is 4.5 per cent and the gap between the average cost of supply and the average tariff is a figure of Rs 4.00 per unit.

18. With the assistance of a loan of Rs125 crore from Power Finance Corporation (PFC), Delhi, ASEB is committed to complete the long languishing run of the river (ROR) 100 MW Karbi Longpi Hydro Electric Power Project. The ASEB also proposes to pose the 38 MW Waste Heat Power Project at Lakowa to JBIC, ADB and the Planning Commission under the non-lapsable Central Pool Resources. ASEB had floated global tenders for implementation of the 30 MW x 3 Amguri Gas Based Power Project and 60 MW x 2 Borgolai Coal Fired Thermal Power Project through the Independent Power Producer (IPP) route. While no bid was offered for the Borgolai Project, one bid was received for the Amguri Project that is being processed by ASEB. The 20 MW Dhansiri HEP is stuck up because the concomitant irrigation project has not been completed. The 150 MW Lower Kopili HEP was to be handed

over to NEEPCO for implementation but could not be done due to some issues raised by the North Cachar and Karbi Anglong District Councils which could not be resolved.

19. One may note that many of the projects under implementation are hydel projects. Our understanding of the complexity of implementing large hydro-electric projects has evolved significantly. We have a much better appreciation of environmental consequences and the difficulties of satisfactorily rehabilitating project-affected people. Many hydel projects were conceived decades ago and they need to be looked at again to explore alternative designs to maximize net social gain. Projects that are so conceived that are sensitive to these needs and can be implemented in small stages are likely to be more desirable for the region. Apart from pressing for more funds for these projects a fresh look at projects in the pipeline should be taken. The NE has a phenomenal hydel potential, so in the long run NE including Assam, should not be short of power. The problem has been poor implementation of projects. Thus the recommendations of S P Shukla commission made in March 1997 for the power sector contain almost all the ones made by L C Jain Committee seven years earlier in April 1990 (See Table 5.8). The work on these projects proceeds at a slow pace due to lack of funds. Power sector reforms have become critical to improve the financial position of ASEB.

Table 5.8: Power Sector: Recommendations of L C Jain Committee (April 1990) and S P Shukla Commission (March 1997)

Jain Committee	S P Shukla Commission	Recommendations	Status
Yes		• ASEB reforms	About to begin
Yes	Yes	• Complete Karbi-Langpi hydel project (100 MW)	Work started in Jan. 1999
Yes	Yes	• Complete Dhansiri hydel project (19.5 MW)	Still going on
Yes		• Upper Karbi Langpi Project expedited (2 x 50 MW)	Preliminary work in 2000-2001
	Yes	• New project Lower Kopily hydel (150 MW)	
		• Initiate Borgoloi coal thermal (120 MW)	Clearance for coal availability obtained
	Yes	• A gas based project at Amguri subject to availability of gas (275 MW)	Gas available only by 2002.
	Yes	• Namrup thermal (gas based) extension (90 MW)	Expenditure proposed
	Yes	• Lakwa Gas thermal (22 MW)	Expenditure proposed
	Yes	• Strengthen Transmission Network (Rs 628 crores – 9th plan requirement)	Expenditure proposed

Source: Compiled from the two reports and data supplied by Govt. of Assam.

20. Power sector reforms are under way. A policy paper on reform was approved by the Assam cabinet in April 2000. A draft Electricity Reform Bill, 2001 has been prepared. Assam Electricity Regulatory Commission (AERC) has been notified and constituted under the chairmanship of Mr Nilomoni Baruah on August 21, 2001. The Government of Assam has already signed a MoU with the Ministry of Power, GOI detailing specific milestones in the state's reform trajectory and improvement of sub T&D system through infusion of funds under the Accelerated Power Development Programme (APDP). In the last fiscal year, Assam got about Rs 20 crore under APDP after signing the MoU and this year the assistance is pegged at around Rs 20 crore again. Power sector reforms should be continued steadfastly and pursued in two directions: (i) price rationalization for which AERC has already been constituted (ii) improvement in Sub T&D through metering, energy and responsibility accounting.

21. It is impossible to overemphasize the need to carry out pricing and pilferage reforms. Even before pricing reforms, ASEB could improve its bill collection. On March 1997, its revenue arrears were 70 per cent of its revenue and the average number of days these arrears were overdue was 255 days (See Table 5.9). For all SEBs together, there were 37 per cent and 137 days respectively.

Table 5.9: Arrears of SEBs as on March 1997

SEBs	Revenue (Rs crore)	Arrears (Rs crore)	Arrears (%) of revenue	No of Days
Assam	414	290	70	255
All SEBs			37	136

22. Unless the ASEB's financial house is in order, private investment would not come forth to take place of public investment. The private generators are required to sell power only to the SEBs. When one's only customer is financially sick, one would think twice before getting into the business. Assam should not count on the Central government's plan of mega-projects. These are to be large projects, which would supply power relatively cheaply. To reduce the price of power, the government offered concessions such as no customs duty and longer tax holiday. Thus, the government provides the subsidy up front. But here also the unreliability of SEBs as customers who may not honour bills is a problem. To get around this, a new public corporation called Power Trading Corporation (PTC) is envisaged. This

will buy all the power from a mega-project, pay the bill (It is not clear how the PTC will pay. It is assumed that the SEBs will pay PTC when they often default on paying other public sector corporations), and in turn sell the power to different SEBs. How would the PTC collect its bills from SEBs? If it cannot, presumably the Central government will foot the bill. Sick SEBs would have even greater incentive to default on payment to a public corporation then to a private generator. This is obvious as today the various SEBs together owe public sector corporations such as NTPC, Coal India, NHPC, et cetera. Rs 27,000 crore. Given this scenario mega-projects are unlikely to get off the ground. Thus reforms are inescapable.

23. The persistent power shortages and poor quality of power make consumers dissatisfied. The cost of power charged to industries has gone up to levels, which induce them to go for captive power. Also, it makes power intensive industries uncompetitive. The poor quality and interruptions in supply affect the competitiveness of other industries as well. Their financial sickness reflected in their inability to pay their suppliers, inability to arrest theft and pilferage, and inability to generate surplus let alone adequate return on investment all call for reforms of SEBs. Assam cannot afford to add one more disadvantage of high-power tariff for industries by delaying power sector reforms.

5.7. Telecommunications

24. Telecommunication is one area in which technological progress has overcome traditional bottlenecks and some relief is observable. Table 5.10 shows the position in Assam and India. The telephone density has grown fourfold in Assam in seven years compared to a threefold increase in India. However, the density in Assam is still only about 40 per cent of that in India. More progress must have been made in last three years and connectivity of Assam has definitely seen noticeable change. The arrival of cellular and Will (wireless in local loop) telephony has now made it possible to provide telecom services to even the most remote village at reasonable cost. Government policy must facilitate this in the North-East which has difficult terrain and many remote villages. As this goes to press, the central government has recently announced that the North East will soon get cellular telephony.

Table 5.10: Telecommunication direct exchange lines

	Assam		**India**	
Year	**('000)**	**(per 1000 persons)**	**('000)**	**(per 1000 persons)**
1991-92	49	2.2	5810	7
1998-99	212	8.4	21594	22

Source: CMIE - Infrastructure, Jan 2001, page 275-276

25. A world-class telecom service at low international prices offers an opportunity to Assam to develop and to overcome its traditional access disadvantage. In the new world of information and computational technology (ICT), telecom is a critical input. The other critical input is skills. The establishment of an IIT, the setting up of many new ITIs and double their number and the plan to set up 446 computer information centres are in each block in North-Eastern states by 2002, all these augurs well. It creates an environment in which private initiative and entrepreneurship can flourish all over the state without depending on many others to do something.

5.8. Financial Infrastructure and Credit Availability

26. Economic activities of investment, production and trade are facilitated and stimulated by the availability of credit. Assam has had poor banking services in the past. Thus many complain that the credit to deposit ratio is very low in Assam suggesting that Assam's savings are used to give credit to other parts of the country and are not available for Assam's development. Thus as Shukla Commission notes (p.90) "in 1994-95 the banking system deployed Rs 2000 crore from deposits made in Assam alone". Also in the same year in the country the "financial institutions sanctioned around Rs 58,000 crore of which the share of North-East region was a bare 150 crore". The situation has improved only marginally in 1999-2000 when out of total disbursal of Rs 79,000 crore, the share of Assam was Rs 450 crore and of North- East region was Rs 540 crore.

27. There is nothing wrong in principle of deploying funds outside if it earns a higher return for Assam's savers. What is wrong is that there were no projects in Assam that could give similar returns. (It may be that there were economically attractive projects in Assam but the banking system did not work efficiently to finance them). Whatever be the reason, with such meagre credit, industrial growth can hardly be expected. The credit/deposit ratio continues to fall. The establishment of the North East Development Finance Corporation (NEDFi) and the North-East Zonal Office (NEZO) of IDBI have raised hope that now finance is available to the North-East. Table 5.11 and 5.12 show the sanctions and disbursement by NEDFi and NEZO in Assam. Whereas since 1996, NEZO has sanctioned just 24 projects NEDFi has sanctioned only 91 projects, this is accelerating. Thus credit to small and large entrepreneurs is now increasingly available in Assam. Yet, one should keep disbursements by NEDFi and NEZO in perspective. The credit disbursed by nationalized banks and rural banks in Assam, which was Rs 450 crore in 1999-2000, is many times more than these, needs to be stepped up

too. Availability of credit is critical for development of small enterprises which in turn, is crucial for Assam's development.

Table 5.11: Financial Assistance by NEDFi in Assam

Year ended on 31st March	Sanctions (Rs Crore)	Disbursement (Rs Crore)	No. of units assisted
1996-97	6.82	6.15	2
1997-98	11.64	2.27	12
1998-99	21.98	10.62	13
1999-2000	17.25	9.32	25
2000-01	40.12	33.60	39
Cum. Total	97.81	61.96	91

Source: NEDFi

Table 5.12: Sanctions and Disbursements by IDBI, NEZO in Assam (1991-2001)

(Rs in crore)

Year	Sanctions		Disbursements
	No. of projects	Amount	Amount
1992	2	5.54	9.79
1993	4	4.20	17.71
1994	7	19.95	7.27
1995	10	25.63	20.5
1996	9	23.94	26.39
1997	5	8.39	12.15
1998	3	11.85	10.50
1999	2	4.50	5.17
2000	3	20.00	18.00
2001	2	16.30	19.73
Total	47	140.30	147.22

Source: IDBI

5.9 Infrastructure: Improving but Still Inadequate

28. This brief review of Assam's infrastructure shows progress made in recent years and also what still needs to be done. Rural roads need to be made all weather roads. The fourth bridge across Brahmaputra should be built in three years not fifteen. Conversion to broad gauge and

double-racking of railways needs to be speeded up, Brahmaputra's development as national water highways needs acceleration. Power sector reforms need to be pushed to ensure quality power. Air connectivity within the North-East, with the rest of India and to the world needs to be improved. Telecommunication development of wireless and cellular telephony provides an opportunity to connect North-East and this should be seized. Credit availability to local entrepreneurs and agriculturists needs to be improved.

5.10 Industrial Development

29. Along with the improvements in infrastructure already made and are underway actions to stimulate industrial development also needs to be taken. In a liberalized economy governments' role in industrial development is that of a facilitator that creates an environment where private industries are attracted and where they flourish. Yet, the government should know which industries have a comparative advantage in Assam and which industries to encourage.

5.10.1 Understanding the Assam Economy

30. A 64 X 64- sector input-output table with 16 primary sectors, 39 secondary sectors and nine tertiary sectors constructed for 1982-83 brings out a few important features of the state economy[2].

- The inter-sectoral interdependence of the Assam economy is low, about 70 per cent of the cells being empty. Agriculture, petroleum and tea industry, in that order, are the three most dominant sectors in the Assam economy.

- The inter-sectoral production linkage is very weak, intermediate consumption being only 35 per cent of the gross value of output.

- Except for 17 commodities/sectors such as other cereals, sugarcane, jute other crops, crude oil, tea, petroleum products, plywood, silk textiles, refractories, and non-metallic mineral products, Assam is heavily dependent on net imports for meeting its internal demand.

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[2] Department of Economics, Gauhati University and Indian Statistical Institute, Delhi Centre (1987-88), The Structure of the Assam Economy (1982-83) and A Perspective Plan of Assam up to 2000 A.D.

- The fixed capital formation (inclusive of change in stock) in the state was as low as 6.5 per cent of the gross value of output.

- The prime exports mostly consist of primary resource based products such as tea, plywood and crude oil and petroleum products.

31. One way of taking a view of the development of an economy is in terms of its sectoral contributions towards generation of income, output, employment and creation of impulses in other sectors through inter-sectoral linkages. This could be evaluated on the basis of sectoral linkages, output and income multipliers based on input-output table. An exercise[3] made taking the structure of the Assam economy for 1982-83 identified top five sectors on the basis of backward linkages as: non-ferrous metal products, leather and leather products, non-metallic mineral products, electrical equipment and tea machinery and on the basis of forward linkages as iron and steel, trade, storage and warehousing, crude oil and natural gas, animal husbandry and petroleum refining.
32. The first five sectors on the basis of output multipliers came out to be: non-ferrous metal products, non-metallic mineral products, electrical equipment, tea machinery and printing and publishing. In aggregate terms, the secondary sector has the highest output multipliers followed by the tertiary sector and then by the primary sector. This suggests that the growth of manufacturing sector drives the gross domestic product. Similarly, the top five sectors on the basis of high-income effect (both direct and indirect) are: grain mill products, edible oil, sugar, non-ferrous metal products and jute textiles. This suggests that agro-based industries in the secondary sector have higher impact on income growth. In aggregate, however, it is the primary sector that has the highest income effect followed by the tertiary sector and then the secondary sector.
33. The results presented above are undoubtedly based on an exercise that is dated. But the basic insights it has provided are still relevant partly because the structure of the Assam economy has not drastically altered. It also provides important clues to the basic question that this paper has addressed.

5.10.2 The Road Ahead

34. The transport disadvantage and loss of markets has stifled the growth of industries in Assam. State Government policies have not been able to overcome these handicaps. In all fairness, it

[3] For greater details, see Department of Economics, Guwahati University and India Statistical Institute, Delhi Centre, Op.Cit.

should also be recognised that the State government's compulsion to deal with various protracted movements by its different parts for autonomous units/states was a distraction away from economic development in the first quarter century since independence (till 1972, when Meghalaya was curved out of Assam). Even later, the movement for Bodoland and insurgency continued to demand engagement of resources and attention.

35. Apart from these exogenous handicaps, the state government failed to formulate a set of priorities in the context of its objective realities. Its planning efforts were faulty and diffused in several ways. For example, given its importance in the state economy, the investment on irrigation, flood control, rural roads, marketing infrastructure, etc should have received a major thrust in its investment plan consistently over a long period. Given the potential as also market demand, other allied activities such as horticulture, fisheries and forestry deserved a far larger investment priority.

36. Faulty strategy was also reflected in wrong type of capital investment, declining capital investment, inadequate and low quality infrastructure such as power, roads and other rural infrastructures. On the other hand, the state government failed to create a favourable environment for private investment to supplement its efforts. It is true, however, that low fiscal capacity has always a great handicap to make best use of even available central assistance. For example, the Assam government lost Rs 650 crore Central fund meant for rural development during the last four years for failing to pay the 'matching share of 25 per cent of the total allocation'.[4]

37. It is in this general framework that the slow growth or the deceleration process in Assam has to be understood. As detailed earlier, the state is hugely deficient in administrative, social and economic infrastructure, as also human capital, all supply side factors. This coupled with poor and uncertain law and order situation does not make Assam a favoured destination for private investment even with tax holidays or freight subsidy as has been extended. On the contrary, there are reports of flight of capital from the state to Siliguri.

38. Even the few modern industries that exist in the state operate in an enclave-type of economy with very little or no linkage at all with its traditional industries. What is worse, the investible surplus generated in these industries is not ploughed back in themselves or in those industries that are viable on the strength of their backward and forward linkages. On the demand side, rising income, even if at a slow pace and in favour of a smaller segment population has induced demand effect that is not supported by the state's production base or lacks any linkage with it. The Jain Committee (1990) estimated an annual outflow of the state at Rs

[4] The Assam Tribune, Guwahati, June 14, 2001.

700 crore in terms of the procurement of foodgrains, fish, edible oils and other food items alone to other states.[5] Though it may make economic sense to import food and export tea and other high value agricultural products for which Assam has a comparative advantage, Assam's agriculture has not developed to exploit its comparative advantage. In other chapters, strategies to develop agriculture and fisheries have been identified.

39. To stimulate industrial development in the state, the following policies can be effective:

(a) Reduce the transport disadvantage through better road, rail and air connectivity.

(b) Develop and open up waterways with better understanding with Bangladesh.

(c) Open up markets in the neighbouring countries through diplomatic initiatives and infrastructure development.

(d) Open of markets for Assam's industries by facilitating Central government purchases for army, railways, etc. from Assam. Provide testing certification facilities for approving the goods in Assam.

(e) At the sectoral level, thrust on agriculture, fisheries, animal husbandry, horticulture, bio-diversity and forestry including farm forestry in the primary sector will be appropriate both on the considerations of excess demand and supply potentials. In the secondary sector, thrust should be generally on environment friendly industries. Industries based on forward and backward linkage of tea and petrochemical industry and processing industry of horticultural products have very good chances to succeed. In the tertiary sector, tourism related activities, road and marketing infrastructure, communication and skill generation and upgradation in general and for IT in particular and R&D, to indicate a few, should be high on agenda. Some of these are explored in greater detail in subsequent chapters.

[5] Planning Commission (1990), Report of the Committee on Clause Seven of Assam Accord.

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6 Connectivity and Transport on the Brahmaputra

6.1 Introduction and Background

1. The Brahmaputra river rises in the Chema yung dung and Kubi glaciers of Western Tibet, near Mount Kailash and Mansarovar Lake, and flows through Tibet, North-East India and Bangladesh before falling into the Bay of Bengal. It has a total length of 2,900 kilometres of which 720 km runs through the Assam Valley and a shorter distance in Arunachal Pradesh. Known as the Tsangpo in Tibet, the river changes its name as it flows into India at Arunachal Pradesh, where it is known as the Siang. Later it becomes the Brahmaputra as it enters Assam and is joined by the Dibang and Lohit. Further downstream in Bangladesh, it is called the Jamuna and then the Padma, after it merges with the Ganges, until it flows into the Bay of Bengal. As many as 40 tributaries fall into it from the northern bank in Assam and another 20 rivers in the southern bank which makes the river a moving sea.

2. It is a majestic waterway and one of the most powerful on earth, influencing the lives and livelihoods of tens on millions of people in the three countries through which it flows. Yet, its influence extends beyond these three nations for the Brahmaputra forms part of a great natural river basin, along with the Ganga and the Barak rivers, which covers an area no less than 174 million hectares in four countries, Tibet, Nepal, Bhutan and Bangladesh and India. In India, it covers a region of 109.84 million hectares or one third of the size of the country.

3. Although the river was used extensively since ancient times for transport, commerce, settlement and conquest, it has fallen into disuse as a major navigational and transport system, especially over the past 50 years. It was designated as National Waterway No 2 to give recognition to its importance as a transport artery.

4. However, little progress has been made on this front despite several reports and studies on the subject. The road network and the railways continue to get much of Central Government support and funding in this regard. A Planning Commission study estimated that by the year 2000, the Indian Railways would carry more than half a billion tons of goods. Yet, in comparison, Inland Water Transport (IWT), which is the cheapest form of surface transport, was expected to carry only a fraction of the railway traffic.

5. In 1872, Sir Henry Cotton remarked that India's greatest need was for water transport for the railways could not carry the quantities expected of them. "Steam boat canals would not have cost more than one eighth that of the railways; would carry any quantities at normal prices and at any speed; would require no support from the Treasury and be combined with irrigation."

6. Nearly half a century before Sir Cotton's remarks, the British navigator and administrator Josh McCosh who discovered the route till Sadiya, one of the further navigable points on the river at the time (it still remains the last major port on the upstream route under a new name, Kundilghat) from Kolkata via Sirajgunj (currently in Bangladesh), said it took him all of 80 days or over 13 weeks to complete the journey.

7. These days, air connectivity is on the increase and there are better road and railway links. Yet, because of the neglect of the waterways and the river transport system as well as delays caused by customs checks at the international border with Bangladesh, travel by the river still takes the same length of time as it did in McCosh's time. This is because, in addition to other factors, night navigation is still a dream and, for the sake of safety, cargo and passenger boats must dock by sunset.

8. The Brahmaputra is a highly braided river, that is, one which is broad and meandering, developing many channels especially in the dry months of winter. The river is a silent witness to the history of the region. For centuries, the Brahmaputra acted as one of the most effective natural barriers to potential conquerors from the mainland. In the 17th century, it was a crucial ally for the Tai-Ahoms, who had migrated there from South East Burma in the 13th century, and enabled them to inflict a humiliating defeat on the Mughals in a fierce battle on the waterfront. The site of the battle is near the city of Guwahati, which is the largest commercial hub of the North-Eastern Region.

9. As noted earlier, the Brahmaputra has been a route that has connected communities and nations over long distances for centuries. In the 19th century, the British, having discovered tea in Upper Assam, decided to develop it as a commercial crop with extensive plantations in the valley. Ships were used to carry labourers who were first transported from the Chota Nagpur area and areas of, what is now, Jharkhand to various parts of Assam to clear the forests and settle the land for tea. Heavy machinery for manufacturing tea also went up by the shipload. The smaller local boats were found inadequate to carry loads as well as travellers and, in 1863, the British began regular steamer services between Kolkata and Assam.

10. It is of significance that virtually the same fleet of steamers had plied profitably between Allahabad and Kolkata but became loss-making ventures after the advent of railways.

11. During this period and until Independence, the steamers carried foodgrains, salt, tea, forest products (especially timber), coal and rocks as well as limited amounts of petroleum products between Kolkata and Assam. The main ports of call were Dhubri, Pandu (Guwahati), Tezpur, Neamati Ghat (near Jorhat), Dibrugarh and Sadiya.

12. The Brahmaputra was, in those days, a deeper river, capable of carrying large transport vessels. The river was navigable from Kolkata to Sadiya. The earthquake of 1950 led to changes in the river's hydrography as well as its silt load capacity. The once-easily navigable river became shallower, especially in the dry months of winter, and reduced the journeys of large ships. In their place, smaller, low-draft local boats, country boats and government ferries began to ply, carrying consumer goods such as milk, vegetables, fruits, meat, fish, cooking fuel, livestock, grain and groceries, including hardware, wood and even vehicles.

6.2 Methodology and Structure

13. After discussions with Advisor (NE), senior officials of the Planning Commission and Development Commissioner (Assam), it was decided to limit the study to two research sites, given the limitation of funds and time. It was also decided that the focus of the study – since it would not be a standalone study but a chapter to be incorporated into the Development Plan crafted by the Indira Gandhi Institute of Development Research, Mumbai – should be non-academic and aimed at developing a check list of actionable proposals.

14. The study has evolved out of field work and interviews with local people, including villagers by the waterfront, ferry owners and users, ship crew members, travellers on the river, engineers on site, water specialists, government officials, geographers, local scholars and others. Research was conducted at three field sites: Neamati Ghat, near Jorhat town; Dibrugarh ghat near Dibrugarh town and Disangmukh ghat, about 30 kilometers north of Jorhat.

15. At Neamati Ghat, researchers handed over a questionnaire to travellers on the local ferries to Majuli Island, one of the largest fresh water islands in the world in the Assamese language, asking basic questions about the occupation of the traveller, his/her background, frequency of travel by boat and purpose for travel and suggestions he/she may have for improving conditions at the ghat as well as establishing better connectivity. A copy of the questionnaire is appended to the Report.

16. In addition, the study team met with district officials at Jorhat and Dibrugarh as well as with NGOs, transporters and entrepreneurs, tea planters and tea company representatives, representatives of the Brahmaputra Board, Flood Control Department, the Inland Water Transport Authority and the state Inland Water Transport (Assam), in addition to river specialists and senior government officials (including the Chief Secretary) at Guwahati and Dispur.

17. In New Delhi, the team interviewed officials from the Ministry of Surface Transport, Ministry of Railways, Inland Water Transport Authority, Ministry of Tourism, specialists in the Asian Transport Centre, Ministry of Water Resources and the Planning Commission.

18. The researcher also visited Kolkata and Haldia for site visits to the Kolkata Port Trust as well as to the Central Inland Water Transport Corporation where he met with offlcials, specialists and entrepreneurs.

6.3 Rationale

19. The Brahmaputra and its tributaries are still used extensively by local communities for local transport, irrigation and agriculture. Yet, its potential as a major inland waterway remains untapped because successive governments, at Central and state levels, have given funds and priority to roads and railways, seeing these as more effective tools of infrastructure support and overall development. IMT remained then and still remains a poor stepsister to its richer relatives, roads and railways.

20. In addition, the river's annual flooding, caused by heavy rainfall in the hill catchment areas, has also led to its neglect. Instead of spending money on using the river, successive state and Central governments have been devising plans, spending money and putting people to work to protect communities and settlements from the river. Thus, Assam today has perhaps the largest length of embankments of any part of the country: over 4,500 kilometres of them. Yet, only 1.5 million hectares of nearly 32 million hectares of flood-prone areas are protected.

21. Annual property damage caused by flooding is vast, running into thousands of crore of rupees. In addition, millions of people are displaced by the high water for months, living in wretched conditions of impoverishment. The loss of crops, cattle and livestock, homesteads and human life adds to the devastation, ensuring that economic development does not take off.

22. This makes the job of using the river to generate funds and development works that will beneflt the large community that much more important. It could, to a degree, also reduce government

expenditure on flood protection by using some of the funds generated by river communications and transport for such purposes.

23. In addition, there are numerous agencies of government, both at the Central and state levels, which make the need for a common strategy using the best resources and expertise available all the more obvious. At the moment, the different government organisations managing for the Brahmaputra are like the Brahmaputra Board, which is mandated to research the entire rain catchment/river drainage area of the river and its tributaries and make specific proposals for tapping the energy levels and reducing the floods.

24. There is the Inland Water Transport Authority located in NOIDA, which looks at policy and technical expertise. Then there are the Assam State Inland Water Transport Corporation in Assam, the Kolkata Port Trust, the Container Corporation of India and the Central Inland Water Transport Corporation. All of them fulfil different roles but there is no single policy to ensure that they work in tandem and not in conflict with each other.

25. There is an international factor with regard to transport on the Brahmaputra: relations with Bangladesh. Earlier, Inland Water Transport (IWT) services were blocked between 1965 and 1972 because of hostilities between India and Pakistan. This eased with the signing of an Indo-Bangladesh Protocol on inland water transit and trade. Yet this route is used very lightly for a number of reasons, including different procedures adopted for evaluation of goods by customs staff from either country, delays in freight remittances, lack of availability of night navigation and limited number of ports of calls/customs stations.

26. Traffic has been steadily dropping: the inter-country level has gone down from 100,000 tons per year in 1995-96 was barely 20,000 tons in 1999-2000. In addition, of the 230 listed vessels in Pandu (Guwahati), only 50 are in working condition. These factors have to be reviewed, for the Brahmaputra is a natural, 365-day highway which needs far less maintenance expenses and running costs than either the road or the rail sectors.

    For transporting food grain, it costs
    Rs. 1.50 per ton/per km carried on the railways,
    Rs. 1.20 per ton/per km carried on the roads,
    Rs. 0.90 per ton/km carried on the waterways.

    In addition, IWT is extremely energy friendly:

27. A 10-ton truck needs 550-600 litres of diesel to drive from Kolkata to Jorhat. Compare this to a 1,500 ton barge which can carry the equivalent of 150 such trucks and consumes 35 litres of

diesel for every kilometre (70,000 litres of diesel for the same distance). If 150 trucks were to travel this distance, they would consume the equivalent of 90,000 litres of diesel. This is a substantial saving and IWT should be promoted just for this one reason.

6.4 Present Status

6.4.1 Channel:

28. The navigational channel from Dhubri, on the border with Bangladesh, to Sadiya to the North is 891 km long. This channel is functional and stable over a period of eight to ten months especially between the months of May and October, when the water levels rise. This rise in level is caused initially by a melting of snows upstream and then the heavy annual rains, both on its upper course and all along its route. During these months, this main channel has an estimated width of about 500 metres to 1.5 km and a depth ranging from 10 to 40 metres.

29. The Inland Water Transport Authority, the pre-eminent national-level authority for waterways does the navigation route marked on maps, which uses a survey vessel for the purpose. However, the state-level counterpart of the IWTA does not have adequate vessels or equipment to conduct similar or at least supportive studies.

30. The stretch especially in Upper Assam is without buoys, bundeling and night navigation facilities, despite official announcements of having provided such navigational facilities along the entire route. As a consequence, the operation of vessels is restricted to daylight hours (10-12 hours) and has led to an increase in operational costs and delayed delivery schedules. The average round voyage from Kolkata to Pandu and back is 60 days. This could be easily halved if the night navigation facility was there.

31. During the floods, the banks are overtopped. This makes selection of terminals and selection of locations for permanent assets such as perennial ports a difficult task. Indeed, when the banks are topped, maximum velocity, according to one report, has been estimated at 4 m/sec. It is difficult to handle vessels, if velocity exceeds 3m/sec.

32. Route maps are not available with most vessels, whether they are playing either over long or short distances.

6.4.2 Government and Private Vessels: capacity and actual carriage

33. Central Inland Water Transport Corporation (CIWTC) vessels from Kolkata, on lease to the Assam state Government, as well as ships belonging to the Assam Inland Water Transport Corporation and private vessels within the state are operational on Waterway No. 2.

34. The CIWTC fleet in Assam has a current strength of 19 tugs, each with a towing capacity of 750 tons; there are 58 barges of 750-ton capacity each and 15 other carriers of 500-ton capacity each. This gives a total transport capacity of 1,062,800 tons for the CIWTC alone.

35. In 1999-2000, the CIWTC carried a total of 3,031 tons of iron and steel as well as food (yellow peas). From Assam, the only product to be sent to West Bengal by river was jute: a bare 600 tons.

36. The CIWTC does not serve ports in Upper Assam such as Tezpur, Silghat, Neamati and Dibrugarh. This has caused congestion of vessels in the main port of Pandu (Guwahati). As a result, potential traffic has remained untapped in Upper Assam -- tea, coal, heavy equipment for oil drilling and exploration, timber etc that would travel far easier by water than road or rail.

37. The Assam State Water Transport Corporation (ASWTC) has the largest number government vessels, with an official listing of 329. A substantial proportion of these vessels are in poor condition. These include 42 boats used for relief work such as rescuing villagers during the time of floods.

38. It should be noted that most of the Assam vessels are used for short-haul operations and the number of those doing long-haul operations is very small. In most cases, ASWTC operations are characterized by vessels that merely cross the river from point to point instead of travelling for any length of time or distance either upstream or downstream.

39. The extent of IWT traffic in Assam is going down. Indeed, the CIWTC haulage plummeted from 48,200 tons in 1992-93 to 27,0671 in 1994-95 and 3,651 tons in 1999-2000. This is because of the attractions of rail and road transport, which are much better organised and quicker, although not cheaper.

40. Passenger traffic is largely in the hands of private vessel owners and operators, who pay a lessee fee to the state government for operating in specific sectors. There has been no organised study of private boat transportation, which enables a ready assessment of the scale of

transportation. We do not have a specific number for private boats and ferries, their capacity, condition and the number of passengers carried every year, the revenues generated (accounted for and unaccounted for), ships added or lost during the year.

41. All this will have to be seen in the context of existing road and rail networks, which have very strong political and economic lobbies. Unfortunately, these lobbies have marginalized IWT.

42. The current road network in Assam is about 70,000 km while the railway has a total of about 2,500 km under both broad gauge and medium gauge lines.

6.4.3 Micro-studies at Neamati Ghat and Dibrugarh

43. We have observed that to provide connectivity to Neamati Ghat, a short distance from Jorhat town, located in the heart of tea growing country, it is important to focus on two aspects: the road and rail links to the town and beyond to the rest of the Valley (National Highway No. 37) (The estimates below were provided to us by local officials, contractors and activists). Until 1967, Neamati was connected to the railhead but this was abandoned after the closure of a private shipping company. Neamati ghat is important in the economy of the river because it is the nodal point for crossing to Majuli, one of the largest fresh water islands in the world, and can connect travellers to the Northern Bank as well.

44. Until 1967, the port was used to transport commodities such as tea to the Kolkata Auction Centre. The silting of the river and sharp erosion of the shore forced the closure of this trade. Indeed, until this time, an oil company maintained a depot at the ghat and a coal depot also was located here. A storehouse also kept large quantities of tea from nearby plantations for onward transport downstream.

45. From Neamati, the state Inland Water Transport system operates seven vessels (ferries). Another 22 private vessels are also operating from here. Official estimates say that 141,995 passengers and 53.7 metric tons of goods were transported through Neamati in 1997-98. But these are official figures; it is believed that the actual figures are far higher but have not been entered into any "books."

46. Market forces drive trade. Given the size of the population in Majuli and Jorhat (a total of 12 lakh), it is estimated that the total value of goods sold and bought in the area is about Rs 50 crore annually.

47. Dibru ghat is near Dibrugarh town and 500 km upstream of Guwahati. Until 1967, the ghat was connected by rail to the town. Until this time, a company named River Steam Navigation Company operated steamer services from Kolkata to Dibrugarh. The shipping company also shut down its operations, saying that its vessels could not traverse the channels because of heavy silting. The rail line was abandoned and there are local ferry services which ply from one side of the river to the other (Sonari ghat). In addition, there is a long distance ferry (IWT of Assam) that takes passengers and goods between Dibrugarh and Oriamghat, near Pasighat in Arunachal Pradesh, a 130-kilometre-journey which takes nine hours to travel upstream.

48. The ghat is under the administration of the Assam State Inland Water Transport Corporation, Dibrugarh division. It runs four routes from Dibru ghat and has three steel ferries and one wooden ferry which are operational. In addition, 36 private boats operate out of Dibru ghat, carrying goods and passengers. In 1998-to-99, the total number of passengers registered as boarding at Dibru ghat was 451,347. The total amount of goods transported was estimated at 167.35 metric tonnes. Based on the population of the area and the volume of the local business and trade, the estimated value of trade out of Dibru ghat has been placed at about 100 crore rupees annually.

6.5 Recommendations:

49. In order to develop communications on the Brahmaputra and generate capacity for transport and economic growth, we propose a 'check list' of recommendations.

50. We especially strongly advocate the development of short-distance travel and freight, in addition to long-term and long-distance transport. The former is cost-effective and benefits would accrue to local communities. These would be visible almost immediately (See recommendations on Neamati ghat and Dibrugarh, page 13 and 14).

51. The study therefore recommends the following to the Government of India and the State of Assam:

    a. Setting up of a Brahmaputra Development Authority (BDA) that would bring under one umbrella organization all the different authorities having responsibility in the waterways sector. Such an authority should be headquartered in Assam – at Guwahati, Jorhat or Dibrugarh -- with a branch office in New Delhi.

    b. The Brahmaputra Board should be the nodal authority for the proposed BDA which should be a publicly held company, with 51 per cent stock held by the BB and the balance with other

Central Government departments, the State Government and private transporters and promoters. Other Central Government Departments which should be involved are the Department of North-East Region, North-Eastern Council, Inland Water Transport Authority, the Surface Transport Ministry, and Ministry of Defence. A model for such an Authority can be developed by a specialist agency.

c. Improvement and modernization of vessels with installation of basic equipment required for safe travel, such as better engines and better designed craft, sonar, wireless communications, life jackets and life insurance for crew members. It is not within the competence of this group to make exact technical assessments but we have come to some basic conclusions based on discussions in the area, in Kolkata and New Delhi as well as documents from different parts of the world.

d. The setting up of basic facilities on shore. This study has focussed on two ports and their environment and makes specific proposals for Neamati and Dibrugarh, although these can be replicated elsewhere. These essential requirements are a toilet complex, a rest house and hygienic eateries as well as a telephone-calling centre.

e. Access to roads and railways, where they exist, that is, inter-nodal transport, should be strengthened. Details for the micro-studies are given in the segments relevant to them. In the future, as a 1996 report of the Ministry of Railways says, the integration of the "rail, road and inland waterway movement, setting up of inland container depots, at the dispersal points served by rail, road and water, is essential. Alongside for bulk commodities, setting up of commodity dumps is necessary. Development of nodal points to feed the rural network in the hinterland is fundamental to the rail/inland waterways/road integration."

f. While huge sums of monies are required for the overall projects, the investments in the local projects are much smaller and executable within a reasonable time frame with local men, designs and materials. Funds can be provided under various schemes including DRDA, Jawahar Rozgar Yojana, MP development fund, MLA development fund and panchayat funds. Local business houses and industries, such as tea, which are interested in investing in these projects, should be given tax benefits.

g. It is to be noted here that neighbouring Bangladesh uses its rivers extensively as a highway network, relying less on roads and virtually not at all on rail. This is not possible in Assam because of the existing road and rail infrastructure and proposed plans to increase their capacity and accessibility. However, better boats and ferries should be used in local crossings over shallow and small rivers, streams and rivulets where other vehicles cannot go

and building of bridges and roads is prohibitively expensive. Planning at the Central and state levels needs to take this into account, that is, to play to the natural advantages of a particular geographical area, by using the resources and skills available locally, instead of trying to push "development" that leads nowhere and benefits only a small group of people.

6.6 Dredging

52. Dredgers need to be acquired i.e. purchased -- not leased as the Assam Government is doing currently -- and used in the low draft season (November-April) continuously to maintain, deepen and widen existing channels. It is suggested that, to start with, two dredgers be acquired and bilateral/multilateral agencies be requested to fund these acquisitions as part of their grants-in-aid projects.

6.7 Bulk Carriage

53. The Government of India should consider special subsidies to encourage private corporations and government departments to transport bulk goods, in containers or otherwise, on the IWT.

54. For this to happen, if one is to discount the Bangladesh corridor to Kolkata/Haldia, then Farakka in West Bengal must be developed as a major inland port, goods and materials be transferred to road and rail from here till Dhubri and then dispatched to all major points upstream by IWT. This can be a good example of inter-modular transport. In addition, the Dhubri railway and road links will require considerable upgrading.

55. The following non-essential bulk goods may be considered for the subsidy in addition to those which are already covered: cars and vehicles, construction materials (including wire, iron rods, granite and marble as well as timber); grain and cooking oil, LPG (both tankers as well as cylinders), POL, fertilizers, capital goods for the nearby Numaligarh refinery.

56. In addition, movement of military and paramilitary forces as well as of heavy weapons and vehicles may be transported by IWT.

6.8 Defence

57. The rivers and waterways of the North-East, not just of Assam, and the rest of the country have been neglected from the security point of view. They form another line of defence and security for the country. The waterways constitute a highway for the effective movement of troops and goods, as base for the development of a fast, fresh water, counter-insurgent strike force.

58. Apart from sophisticated weaponry, such a force would also need high-quality, fibre-glass boats equipped with the latest communications systems. The Coast Guard and the BSF Bay Wing at Dhubri may be consulted in terms of costs.

59. This proposed force may be called the Inland River Defence Fleet (Inland RDF) and can comprise the River Wing of the Army, which is already in existence, as the core group, and elements from the local police and paramilitary forces. The Navy and Coast Guard must also be involved in such a process. A new cadre can eventually be developed which can later call for direct recruitment.

60. Heavy military equipment, trucks and other vehicles can be transported by IWT at a concessional rate.

61. The huge stocks of food grain, cooking oil and other consumer items that the security forces consume should be sent by IWT and then offloaded onto trucks and other transport. This would drastically reduce the fuel bills for the army and paramilitary forces incurred in transporting these goods over long distances.

6.9 Tourism

62. Long- and short-distance luxury and semi-luxury boats, with furnished cabins, can be built on the pattern of Bangladesh. There are companies in Bangladesh which outfit such tours and ships and it would be useful to establish contacts with them. Packaged well and with high quality ships, cuisine and accommodation as well as efficient crews and good safety records, such tours could draw upper middle class Indians as well as foreign tourists who want to "get away from it all". Such tours could involve, for example, a visit from Guwahati to Majuli, the island famous for its Vaishnavite culture and monasteries as well as migratory species of birds, and then to the Kaziranga National Park before driving to Jorhat and then flying out of tea country to the nearest other connection in other parts of India.

63. Given the condition of the state's roads, many ordinary passengers may not mind travelling by ship instead of bus or train. With the implementation of night navigation, travel time would be halved and the river ports along the routes would grow and bustle, as their road counterparts have done over these past decades.

6.10 Scientific survey

64. A scientific survey needs to be conducted at the huge inland delta comprising the Dibang and Lohit as well as their meeting point with the Dihang in Arunachal Pradesh. This is the geographical region where the Brahmaputra develops the characteristics for which it is known later in its course. At this point, according to one senior geographer in Assam, 400 million tons of silt are deposited and transported ever year. This is a staggering figure and only a well-equipped, top-level scientific study can consider how the problem of silting can be tackled. In this effort, Government may need to consider associating international experts especially from South East Asia and continental North and Latin America (experts who have studied the Mekong, the Mississippi and the Amazon, all powerful rivers).

6.11 Modernization

65. Upgradation of vessels and navigation may also need international expertise. For this, government may consider inviting specialists from Bangladesh, which has developed a unique culture and system of using its waterways as highways, both small and large. Theirs is the best example of the use of waterways, harnessing it as a natural advantage, given their disadvantages in other areas.

66. Inter-modular hubs involving rail, road and IWT to be developed along the course especially at Dibrugarh, Neamati, Dhubri and Jogigopa. One such port exists but only at Pandu, which as has been noted highly congested.

67. Should the Bangladesh route be used effectively in the future, these hubs could be upgraded to taken international traffic of goods and passengers.

6.12 Financial Implications:

68. The financial implications of developing a transport and communications network throughout the Brahmaputra Valley needs wider study and more time as well as resources, both in terms of manpower and resources. We are able to develop some general projections at the macro level and specific projections at the micro level for the two studies.

69. It has been the experience of government and the public that large projects are bogged down in red tape and inner wrangling, causing endless delays and raising public frustration. Hence it is important that small, seemingly "doable" projects be implemented with speed and commitment so that public needs and concerns are met.

1. Setting up of the Brahmaputra Valley Authority (BVA)

70. With headquarters in Guwahati and a representative/liaison office in Delhi and branch offices at major ports along the river -- Dhubri, Jogigopha, Tezpur, Neamati, Dibrugarh, Sadiya.

71. Rs. 25 crore would be needed to set it up (Capital expenses: office buildings, vessels, communications equipment, recurring expenses: salaries and staff amenities, maintenance etc., continuing research and Initial consultancy).

2. Upgradation and maintenance of main channel:

Dredgers	2 @ Rs. 3 crore each	Rs. 6 crore
Buoys	500 @ Rs. 5 lakh each	Rs. 25 crore
(Cost of making buoys, placing them and bundling)		
Survey Vessel		Rs. 5 crore
(Research expenditure on river studies, maintenance of equipment, buoys, vessels etc.)		Rs. 5 crore
Total (annual)		Rs. 41 crore

3 Modernization of Vessels (100 goods carriers)

(Need to install sonar meter, wireless sets, life saving equipment, cranes, replacement of existing wood vessels by steel double-decker vessels: most of the goods vessels carry 20 tons of goods and passenger vessels can carry a load of 50-to-100 tons, including vehicles and people)

Cost of sonar meter	@ Rs 1.5 lakh per vessel x 100	Rs 1.5 crore
Cost of wireless sets	@ Rs 1.5 lakh per vessel x100	Rs 1.5 crore
Cost of improving carrying capacity		
	@ Rs 20 lakh per vessel	Rs 20 crore
Life saving equipment		
(medical equipment, life jackets, inflatable dingies)		
	@ approximately Rs 2 lakh per vessel	Rs 2 crore
Upgrading of engines,		
(conversion of wood to steel plated boat)		
	@ Rs 50 lakh per boat	Rs 50 crore
	Total	Rs 75 crore

4. a. Neamati

The cost of constructing a 12 km railway line (currently in disuse) from Jorhat to Neamati Ghat @ Rs One crore per kilometre	Rs 12 crore
The cost of building an all weather, permanent road to Neamati Ghat via Lahdoigarh in replace the existing broken track @ Rs 75 lakh per kilometre	Rs 11.25 crore
A 10-seat Sulabh toilet complex:	Rs 15 lakh.
Construction of a 50 metre concrete berth at Neamati Ghat with mechanized handling (for one barge and two passenger vessels)	Rs 5 crore
Construction of a container depot/storage hall (50 metre x 50 metre)	Rs 5 crore
150 ton crane (one)	Rs 3 crore
50 ton crane (one)	Rs 1.5 crore
Small movers (five)	Rs 2.5 crore
Total	Rs 40.40 crore

4.b. Dibru ghat

1 Cost of upgrading existing road from city to the port	Rs 3 crore
2 Cost of upgrading existing railway line (BG), 2 km	Rs 2 crore
3. Construction of 50 metre concrete berth at Dibrugarh	Rs 10 crore
4. Construction of container depot (50 metres x 50 metres)	Rs 10 crore
5. 150 ton crane (One)	Rs 3 crore
6. 50 ton crane (one)	Rs 1.5 crore
7. Small movers (One)	Rs 2.5 crore
Total	Rs 32 crore
Grand Total from 1-4:	**Rs 241.8 crore**

Conclusions

72. The development of river communications on the Brahmaputra can mark a turning point for sustainable development in the region. Integrating with other modes of transportation, IWT can

play a vital role in infrastructure building in an under- developed state like Assam. The use of waterways will generate employment, both directly and indirectly. Trade and other economic activities will enhance the economy of the region significantly, especially if incentives are provided for investment in water transport.

73. A detailed study of opportunities for defence, communications and transport on the entire length of the Brahmaputra should be entrusted to the Department of North-Eastern Region. Such a study should be given top priority as part of the Government's effort to reach out to this region, give it a sense of inclusion in the task of ending disparities and, in the process, using its unique heritage and natural advantages to the full.

7 Agriculture and Allied Sectors: Constraints and Policy Options

1. Agriculture in Assam exhibits most of the characteristics of underdeveloped/backward agriculture, namely, a high dependence on agriculture for livelihood, widespread practice of traditional farming techniques and correspondingly low usage of modern farm inputs, low levels and low growth in productivity and incomes in the sector, widespread prevalence of subsistence cultivation, poor / inadequate agricultural infrastructure, and so on. About 89 per cent of the population in Assam lives in rural areas as per the 1991 Census. About 75 per cent of the state's population is directly or indirectly dependent on agriculture, while about 69 per cent of the workforce in the state is actually engaged in agricultural activities. On the other hand, the sector's contribution to the state's income has been falling sharply over time, from nearly 50 per cent in early 1980s to only about 35 per cent by the end of 1990s. Though this is natural when economic development occurs, in Assam this has come about despite the slow overall economic growth in the state. Even though the state is richly endowed in natural resources, such as abundant rainfall, alluvial soil, rich and diverse plant and animal genetic base, development of agriculture in Assam has been slow over the decades. Consequently, the state is not just lagging behind most others in the country but is unable to meet its own requirements in many agricultural commodities.

2. In this chapter, we examine the progress of agriculture in Assam, the constraints it faces and possible policy actions that can be taken to remove / reduce those constraints to agricultural growth in the state.

7.1 Data

3. Before proceeding to assess the status of agriculture in Assam, a few remarks on the database are warranted. The analysis in this chapter relies on secondary data on various variables of interest. The data have been collated from various official statistical documents published by the Government of India, the Government of Assam, the North-Eastern Council, the Fertiliser Association of India, and the Assam Agricultural

University, Jorhat. The analysis is confined to the post-1980 period up to the latest year for which data are available.

4. There are innumerable problems in the official data on many variables. One such problem with regard to the gross cropped acreage total and under different crops is reported in Table 7.1 as an illustration. The data on total cropped acreage under the state does not tally with the sum total of the acreage under individual crops. This obviously raises doubts about estimates of cropping intensity, cropping patterns, yield levels, et cetera.

5. Similarly, the data on irrigation also present a somewhat confusing and uncertain picture. On one hand, the data on net area irrigated in the state has not been updated ever since 1953-54. Whereas at other places in the above-mentioned data sources, various figures are reported as the irrigation potential developed and potential utilized. In such a situation, the true picture with regard to the status of irrigation cannot be properly gauged. Further, the status with regard to the availability / use of irrigation for different crops is more or less unknown, as the crop-wise irrigation data have not been updated since 1953-54.

6. Similar problems abound with regard to the data on other variables too. With the available data being in such a situation, one can obtain only a rough idea of the state of affairs with regard to agriculture in Assam. Caution is well advised while interpreting the data presented in the tables reported in this chapter. We use them only to obtain a rough comparative picture of the status of agriculture in Assam vis-à-vis the country as a whole and in some cases with Punjab, probably agriculturally the most advanced state in India. We believe that such comparisons, though lacking in precision, could still provide valuable insights into the problems confronting agriculture in Assam. With these caveats, we proceed with the analysis in the rest of this chapter.

7. In Table 7.1, the data on total cropped acreage and the cropping intensity in Assam are reported. Subject to the data problems mentioned above, one finds that gross cropped acreage in Assam has increased over the 1980s and 1990s. Cropping intensity too has registered significant increase over this period, albeit with some large fluctuations. It is interesting to note that cropping intensity in Assam has consistently been higher than the national average. The growth in gross cropped acreage and in cropping intensity, however, has not translated into rapid growth in output. The all crop index of agricultural production in Assam (See Table 7.2) has grown by less than one per cent per annum (average over 1992-93 to 1998-99), in comparison with an average growth of about 2.7 per cent per annum at the all-India level over the same period.

8. Turning to the cropping pattern in Assam, Table 7.3 reports the crop-wise shares in the total gross cropped area in Assam. It is seen that the cropping pattern in Assam has been more or less stable with only marginal changes in the importance of a few crops. Rice is the most important crop in Assam with a fairly stable share in the total cultivated area.

Rapeseed and mustard, and tea are the next most important crops, again with fairly stable shares. Wheat, pulses, jute and mesta, and sugarcane have witnessed a marginal decline in their shares while potato, banana, arecanut and chillies have gained importance over time.

Table 7.1: Cropped acreage and cropping intensity

Year	Net	Gross cropped area			Cropping Intensity (%)	
	sown	Official	Sum over	Difference#	Assam	All-India
	area	figures$	crops*	(%)		
1980-81	2655	3446	3294	4.4	129.8	123.3
1981-82	2696	3439	3291	4.3	127.6	124.5
1982-83	2696	3556	3410	4.1	131.9	123.2
1983-84	2696	3577	3430	4.1	132.7	125.7
1984-85	2696	3718	3571	4.0	137.9	125.2
1980-81 to	**2688**	**3547**	**3399**	**4.2**	**132.0**	**124.4**
1984-85						
1985-86	2706	3794	3640	4.1	140.2	126.7
1986-87	2706	3644	3495	4.1	134.7	126.4
1987-88	2706	3700	3538	4.4	136.7	127.3
1988-89	2706	3654	3487	4.6	135.0	128.5
1989-90	2706	3752	3581	4.6	138.7	128.1
1985-86 to	**2706**	**3709**	**3548**	**4.3**	**137.1**	**127.4**
1989-90						
1990-91	2706	3797	3629	4.4	140.3	129.9
1991-92	2706	3860	3688	4.5	142.6	130.1
1992-93	2706	3837	3659	4.6	141.8	130.1
1993-94	2706	3817	3644	4.5	141.1	131.0
1994-95	2777	3825	3591	6.1	137.7	131.5
1990-91 to	**2720**	**3827**	**3642**	**4.8**	**140.7**	**130.5**
1994-95						
1995-96	2780	3938	3647	7.4	141.7	131.2
1996-97	3279	4621	3654	20.9	140.8	130.6
1997-98			3666			

Notes:
a) Net sown area and gross cropped area (GCA) are in 000 hectares.
b) All the documents cited below report the same figure for net sown area for all the years between 1985-86 to 1993-94.
c) $ This refers to the GCA data as reported in the documents cited below.
d) * This refers to the sum total of the individual crop-wise gross acreages reported in the documents cited below.
e) # This refers to the difference between the official figure and the sum total over crops (expresed as %).
f) Cropping intensity is defined as gross cropped area over net sown area in percentage. GCA sum over crops are used in this calculation for Assam.

Source:
a) Data are from *Area and Production of Principal Crops,* Govt. of India, and *Fertiliser Statistics.*
b) Calculations are by author and Goyari (2000).

Table 7.2: Index of agricultural production

Year	Assam			All-India		
	Food	Non-food	All crops	Food	Non-food	All crops
1992-93	144	142	143	144	164	152
1993-94	148	149	148	150	170	157
1994-95	146	154	150	156	181	165
1995-96	150	157	153	146	185	161
1996-97	148	157	153	161	201	176
1997-98	149	161	155	156	181	165
1998-99	143	158	151	165	198	177
Percentage change over previous year						
1993-94	2.8	4.9	3.5	4.2	3.7	3.3
1994-95	-1.4	3.4	1.4	4.0	6.5	5.1
1995-96	2.7	1.9	2.0	-6.4	2.2	-2.4
1996-97	-1.3	0.0	0.0	10.3	8.6	9.3
1997-98	0.7	2.5	1.3	-3.1	-10.0	-6.3
1998-99	-4.0	-1.9	-2.6	5.8	9.4	7.3
Average growth rate	-0.1	1.8	0.9	2.4	3.4	2.7

Source: a) Data are from Economic Survey - Assam: 2000-2001, Govt. of Assam.
b) Calculations are by author.

7.2 Agricultural Situation in Assam

9. Which are the crops in which Assam is a significant producer in the country? Assam's share in the country's acreage and output of various crops are presented in Tables 7.4 and 7.5, respectively. Assam accounts for a fairly significant share of the country's acreage and output of many crops. Notable are rice, rapeseed and mustard, jute and mesta, tea, potato, sweet potato, banana, papaya, arecanut and turmeric. Tea, of course, is the pride of Assam. Assam is not just the largest producer of tea in the country (accounting for over half the country's output), but it accounts for about 14 per cent of the world's tea output. Another feature that emerges from these two tables is that there is a remarkable stability in Assam's share in both the acreage and output of several crops, particularly foodgrains crops. Only a few crops show a small but steady trend in their acreage / output shares in the country. In the case of oilseeds, sugarcane and turmeric Assam's share (both acreage and output) in the country has declined while in the case of potato, sweet potato and papaya Assam's share has increased. Tea and banana are the only two crops in which Assam's share in the country's output has witnessed a marginal decline though its share in the country's acreage has been more or less stable.

10. Is there scope for expanding the cultivation of those crops in which Assam has market power in the country? Table 7.6 presents a two-way categorization of the various crops according to their acreage share in the cropping pattern in Assam and if Assam is an important producer of the crop in the country. The table is self-explanatory. Assam has emerged as an important producer in the country in many crops such as sweet potato, banana, papaya, chilies, turmeric cabbage, cauliflower, brinjal, lemon, orange and pineapple even

Table 7.3: Cropping pattern in Assam - % in total gross cropped area

Year	Rice	Wheat	Total cereals	Total pulses	Food-grains	R & M	Total oilseeds	J & M	Tea	Sugar-cane	Potato	Sweet potato	Banana	Papaya	Areca-nuts	Chillies	Turmeric
1980-81	69.06	3.10	73.10	3.44	76.54	6.47	7.08	3.77	6.09	1.46	1.16	0.31	0.75	0.10	1.55	0.33	0.24
1981-82	68.64	3.11	72.57	3.56	76.13	6.81	7.42	3.73	6.17	1.50	1.24	0.30	0.78	0.09	1.43	0.31	0.24
1982-83	67.50	3.09	71.42	3.71	75.13	7.85	8.48	3.78	6.20	1.45	1.27	0.28	0.75	0.12	1.44	0.30	0.24
1983-84	67.43	2.89	71.13	3.81	74.94	8.34	9.01	3.31	6.21	1.43	1.29	0.25	0.79	0.12	1.46	0.27	0.25
1984-85	65.10	4.19	70.18	3.87	74.04	8.96	9.75	3.39	6.02	1.48	1.37	0.29	0.88	0.13	1.43	0.32	0.24
1980-81 to	**67.50**	**3.29**	**71.65**	**3.68**	**75.33**	**7.71**	**8.38**	**3.60**	**6.14**	**1.47**	**1.27**	**0.29**	**0.79**	**0.11**	**1.46**	**0.31**	**0.24**
1984-85																	
1985-86	67.69	2.55	71.05	3.86	74.91	7.99	8.72	3.59	5.94	1.31	1.48	0.23	0.81	0.11	1.39	0.30	0.25
1986-87	65.44	3.43	69.69	4.13	73.82	8.86	9.57	3.90	6.43	1.33	1.61	0.26	0.88	0.14	1.65	0.32	0.25
1987-88	66.03	2.78	69.61	3.73	73.35	9.54	10.28	3.05	6.41	1.22	1.53	0.24	0.92	0.16	1.66	0.32	0.26
1988-89	65.99	3.05	69.82	3.49	73.31	9.27	9.97	3.03	6.58	1.20	1.66	0.24	0.99	0.14	1.71	0.36	0.24
1989-90	68.00	2.60	71.43	3.16	74.59	8.48	9.14	2.98	6.43	1.08	1.59	0.23	0.96	0.11	1.76	0.35	0.23
1985-86 to	**66.64**	**2.88**	**70.33**	**3.67**	**74.00**	**8.82**	**9.53**	**3.31**	**6.36**	**1.23**	**1.57**	**0.24**	**0.91**	**0.13**	**1.63**	**0.33**	**0.25**
1989-90																	
1990-91	68.62	2.31	71.79	3.12	74.91	8.13	8.81	2.85	6.43	0.99	1.63	0.26	0.98	0.13	1.82	0.36	0.22
1991-92	68.54	2.07	71.39	3.17	74.56	8.22	8.90	3.17	6.34	1.02	1.67	0.25	1.07	0.13	1.83	0.34	0.22
1992-93	68.94	2.02	71.73	2.98	74.71	7.93	8.60	2.84	6.41	1.09	1.74	0.24	1.10	0.12	1.92	0.35	0.22
1993-94	69.31	2.17	72.21	3.00	75.21	7.67	8.37	2.96	6.46	0.98	1.76	0.25	1.14	0.13	1.96	0.36	0.24
1994-95	68.23	2.24	71.25	3.03	74.28	7.84	8.59	2.71	6.32	0.99	2.01	0.25	1.19	0.14	1.99	0.36	0.27
1990-91 to	**68.73**	**2.16**	**71.68**	**3.06**	**74.74**	**7.96**	**8.65**	**2.90**	**6.39**	**1.02**	**1.76**	**0.25**	**1.10**	**0.13**	**1.90**	**0.35**	**0.24**
1994-95																	
1995-96	68.64	2.35	71.83	2.93	74.76	7.65	8.39	2.25	6.20	0.98	2.03	0.25	1.11	0.20	1.98	0.39	0.26
1996-97	68.20	2.41	71.41	3.27	74.68	7.55	8.31	2.68	6.22	0.89	2.01	0.25	1.13	0.22	2.03	0.40	0.27
1997-98	67.91	2.39	71.03	3.22	74.25	7.62	8.64	2.69	6.23	0.85	2.05	0.26	1.18	0.16	2.02	0.39	0.28

Notes: a) Gross cropped area sum over crops reported in Table 1 are used for these calculations.
b) R & M refers to rapeseed and mustard.
c) J & M refers to jute and mesta.
d) Other crops account for the balance percentage.

Source: a) Data are from *Area and Production of Principal Crops,* Govt. of India, and *Fertiliser Statistics* .
b) Calculations are by author and Goyari (2000).

Table 7.4: Assam's share (%) in All-India acreage

year	Rice	Wheat	Total cereals	Total pulses	Total foodgrains	R & M	Total oilseeds	J & M	Tea	Sugar-cane	Potato	Sweet potato	Banana	Papaya	Areca-nuts	Chillies	Turmeric
1980-81	5.7	0.5	2.3	0.5	2.0	5.2	1.3	9.6	52.6	1.80	5.2	4.8	8.5	13.0	27.5	1.3	7.7
1981-82	5.5	0.5	2.3	0.5	1.9	5.1	1.3	10.7	52.9	1.55	5.3	4.4	8.9	10.9	25.8	1.3	8.7
1982-83	6.0	0.4	2.4	0.6	2.0	7.0	1.6	12.6	53.6	1.47	5.9	4.4	8.9	14.7	26.7	1.3	9.4
1983-84	5.6	0.4	2.3	0.6	2.0	7.4	1.7	10.8	53.8	1.58	5.9	4.0	9.6	14.2	27.0	1.2	9.1
1984-85	5.6	0.6	2.4	0.6	2.1	8.0	1.8	10.7	53.9	1.79	5.7	5.5	10.4	14.3	27.5	1.4	8.2
1980-81 to	**5.7**	**0.5**	**2.3**	**0.5**	**2.0**	**6.5**	**1.5**	**10.9**	**53.4**	**1.64**	**5.6**	**4.6**	**9.2**	**13.4**	**26.9**	**1.3**	**8.6**
1984-85																	
1985-86	6.0	0.4	2.5	0.6	2.1	7.3	1.7	9.5	54.0	1.68	6.4	4.7	9.7	15.4	27.3	1.2	8.3
1986-87	5.6	0.5	2.3	0.6	2.0	8.3	1.8	10.0	54.7	1.51	6.8	5.1	10.2	16.5	29.5	1.4	8.1
1987-88	6.0	0.4	2.5	0.6	2.2	7.3	1.8	11.2	54.8	1.32	6.1	5.3	10.6	14.6	29.4	1.5	8.3
1988-89	5.5	0.4	2.3	0.5	2.0	6.7	1.6	11.3	55.3	1.25	6.2	5.4	10.5	10.6	29.3	1.6	6.8
1989-90	5.8	0.4	2.5	0.5	2.1	6.1	1.4	11.3	55.5	1.13	6.1	5.4	10.4	13.1	30.0	1.4	6.7
1985-86 to	**5.8**	**0.4**	**2.4**	**0.6**	**2.1**	**7.2**	**1.7**	**10.7**	**54.9**	**1.38**	**6.3**	**5.2**	**10.3**	**14.1**	**29.1**	**1.4**	**7.6**
1989-90																	
1990-91	5.8	0.3	2.5	0.5	2.1	5.1	1.3	10.1	56.0	0.97	6.3	6.2	9.7	12.4	30.4	1.6	6.7
1991-92	5.9	0.3	2.7	0.5	2.3	4.6	1.3	9.8	55.6	0.98	6.0	5.9	10.4	10.8	30.6	1.5	6.8
1992-93	6.0	0.3	2.6	0.5	2.2	4.7	1.2	10.6	55.8	1.12	6.0	6.3	10.0	11.1	31.0	1.3	6.3
1993-94	5.9	0.3	2.6	0.5	2.2	4.4	1.1	9.3	56.3	1.05	6.1	6.3	9.6	12.8	30.3	1.4	6.0
1994-95	5.7	0.3	2.5	0.5	2.2	4.6	1.2	10.4	53.3	0.92	6.8	6.5	10.2	12.8	29.3	1.6	6.5
1990-91 to	**5.9**	**0.3**	**2.6**	**0.5**	**2.2**	**4.7**	**1.2**	**10.0**	**55.4**	**1.01**	**6.2**	**6.2**	**10.0**	**12.0**	**30.3**	**1.5**	**6.5**
1994-95																	
1995-96	5.8	0.3	2.7	0.5	2.3	4.3	1.2	10.2	52.7	0.9	6.7	6.5	9.4	17.4	28.4	1.6	6.7
1996-97	5.7	0.3	2.6	0.5	2.2	4.2	1.2	9.0	52.6	0.9	5.9	6.9	9.4	16.3	28.4	1.5	7.4

Notes: a) R & M refers to rapeseed and mustard.
b) J & M refers to jute and mesta.

Source: a) Data are from *Area and Production of Principal Crops,* Govt. of India, and *Fertiliser Statistics*.
b) Calculations are by author.

Table 7.5: Assam's share (%) in All-India output

year	Rice	Wheat	Total cereals	Total pulses	Total foodgrains	R & M	Total oilseeds	J & M	Tea	Sugar-cane	Potato	Sweet potato	Banana	Papaya	Areca-nuts	Chillies	Turmeric
1980-81	4.7	0.3	2.2	0.4	2.1	4.4	1.2	11.8	52.8	1.12	2.3	2.2	7.3	13.0	25.6	1.2	2.3
1981-82	4.2	0.3	1.9	0.5	1.8	4.3	0.9	12.0	54.4	1.16	2.9	1.9	7.4	19.4	24.8	1.2	2.6
1982-83	5.5	0.3	2.3	0.4	2.1	5.7	1.4	14.0	53.4	1.10	2.7	2.0	8.4	17.9	27.2	1.1	2.9
1983-84	4.2	0.3	1.9	0.4	1.8	5.5	1.2	11.7	57.3	1.24	2.6	1.8	7.6	20.0	25.2	1.0	2.5
1984-85	4.2	0.4	2.0	0.5	1.8	4.0	1.1	11.3	58.2	1.58	2.6	2.1	7.7	30.0	29.4	1.1	2.0
1980-81 to	**4.5**	**0.3**	**2.1**	**0.4**	**1.9**	**4.8**	**1.1**	**12.2**	**55.2**	**1.24**	**2.6**	**2.0**	**7.7**	**20.0**	**26.4**	**1.1**	**2.4**
1984-85																	
1985-86	4.5	0.2	2.2	0.5	2.0	5.1	1.4	9.7	55.1	1.16	2.9	1.9	7.0	28.5	27.8	0.7	1.5
1986-87	3.9	0.3	1.9	0.5	1.8	5.7	1.4	11.5	51.1	1.14	2.7	1.9	6.8	31.5	26.7	1.0	1.7
1987-88	4.8	0.2	2.2	0.6	2.1	4.8	1.4	13.7	54.7	0.96	2.3	2.2	7.0	28.2	27.0	1.2	1.8
1988-89	3.5	0.2	1.7	0.4	1.5	3.5	0.9	9.1	54.3	0.92	2.3	2.1	7.4	15.0	31.4	1.1	1.4
1989-90	3.8	0.2	1.8	0.4	1.7	3.3	0.9	10.0	56.4	0.74	2.3	2.2	6.9	20.0	28.0	0.9	1.1
1985-86 to	**4.1**	**0.2**	**2.0**	**0.5**	**1.8**	**4.5**	**1.2**	**10.8**	**54.3**	**0.98**	**2.5**	**2.1**	**7.0**	**24.6**	**28.2**	**1.0**	**1.5**
1989-90																	
1990-91	4.4	0.2	2.1	0.3	2.0	3.0	0.9	9.8	55.1	0.63	2.8	2.5	6.4	15.4	21.2	1.0	1.5
1991-92	4.3	0.2	2.1	0.4	2.0	3.0	1.0	8.8	54.6	0.57	2.9	2.3	6.6	18.5	22.0	1.2	1.3
1992-93	4.5	0.1	2.0	0.4	1.9	2.9	0.7	12.4	55.0	0.68	2.5	2.4	6.3	19.8	21.6	1.0	1.3
1993-94	4.2	0.2	2.0	0.4	1.9	2.5	0.7	8.3	52.7	0.60	2.9	2.4	5.8	21.9	20.1	1.1	0.8
1994-95	4.0	0.2	1.9	0.4	1.8	2.6	0.8	10.5	53.9	0.55	3.3	2.7	6.0	22.8	18.8	1.1	1.0
1990-91 to	**4.3**	**0.2**	**2.0**	**0.4**	**1.9**	**2.8**	**0.8**	**9.9**	**54.3**	**0.61**	**2.9**	**2.5**	**6.2**	**19.7**	**20.7**	**1.1**	**1.2**
1994-95																	
1995-96	4.4	0.2	2.1	0.5	2.0	2.4	0.7	9.9	51.6	0.53	2.7	2.7	5.3	22.3	17.7	1.2	1.4
1996-97	4.1	0.2	1.9	0.5	1.8	2.1	0.7	7.5	52.4	0.46	2.4	2.9	5.6	20.5	20.8	0.9	1.3

Notes: a) R & M refers to rapeseed and mustard.
b) J & M refers to jute and mesta.

Source: a) Data are from *Area and Production of Principal Crops,* Govt. of India, and *Fertiliser Statistics*.
b) Calculations are by author.

though less than one per cent of the cropped area in Assam is being used for cultivating each of them. There is thus, tremendous scope for pushing the acreage under these crops, and in general under vegetables, fruits and spice crops. All these crops are high value crops widely considered to have enormous potential for commercialization.

Table 7.6: Crop categorization

	Assam important in All-India	Assam unimportant in All-India
Acreage share > 1% in total cropped area in Assam	Rice Rapeseed & mustard Jute & mesta Tea Potato Arecanut	Wheat Pulses
Acreage share < 1% in total cropped area in Assam	Sweet potato Banana Papaya Chillies Turmeric Cabbage* Cauliflower* Brinjal* Lemon* Orange* Pineapple*	Sugarcane

Notes: a) Assam is considered an important producer of a crop in the country if its share in acreage (and output) has consistently been over 1% over the period 1980-81 to 1996-97; unimportant otherwise.
b) * For these crops the classification is based on data from 1991-92 onwards as the relevant time series data are not available for the earlier years.

Source: Based on data presented in Tables 3, 4 and 5.

11. Turning to productivity levels in Assam, it can be seen from Table 7.7 that yield levels of all the major crops in Assam are very low and well below their corresponding national average. More distressing is the fact that the gap in yield levels between Assam and the national average has widened for all the crops reported in Table 7.7. This situation has emerged in spite of positive and significant growth in yields of all crops in Assam except sugarcane and arecanut. That is, while productivity levels are improving in Assam, they are improving much faster in the rest of the country. The gap in productivity levels is not just in terms of aggregate yields, but is also true under both irrigated and unirrigated situations. This can be seen from the comparison with Punjab in Table 7.8 for the few crops for which such data are available. This shows clearly how much Assam is lagging behind the best practice achieved elsewhere in the country, even under irrigated conditions.

Table 7.7: Crop-wise yields and growth rates

Crop	Yield levels (kilo grams per hectare)						Exponential growth rates (%)		
	1980-81 to 1984-85		1985-86 to 1989-90		1990-91 to 1994-95		1980-81 to 1994-95		
	Assam	All-India	Assam	All-India	Assam	All-India	Acreage	Yield	Production
Rice	1071	1350	1114	1584	1313	1807	0.8	1.8	2.6
Wheat	1146	1770	1059	2066	1267	2388	-2.8	0.8*	-2.1
Foodgrains	1037	1080	1073	1231	1271	1453	0.6	1.9	2.4
R & M	458	624	475	772	521	874	1.4	0.9*	2.3
Jute	1478	1467	1560	1696	1721	1876	-2.1	1.2	-0.9*
Tea	1501	1451	1614	1630	1728	1764	1.1	1.4	2.5
Sugarcane	43201	57257	43602	61387	40084	66736	-2.8	-0.4*	-3.2
Potato	6566	14166	5922	15037	7354	15900	4.0	1.2	5.2
Arecanuts	980	1083	1163	1167	780	1141	3.2	-2.6	0.6*

Notes: a) R & M refers to rapeseed and mustard.
b) The growth rates are all for Assam. All growth rates are significant at 5% level, except those with an asterix.

Source: a) Data are from *Area and Production of Principal Crops,* Govt. of India, and *Fertiliser Statistics.*
b) Calculations are by Goyari (2000).

Table 7.8: Crop yields under irrigated and unirrigated conditions (kg/ha)

Year	Autmn rice		Winter rice		Summer rice		Wheat		Rapeseed & Mustard	
	Irrigated	Unirrigated	Irrigated	Unirrigated	Irrigated	Unirrigated	Irrigated	Unirrigated	Irrigated	Unirrigated
Assam										
1993-94	1849	1058	1847	1428	2103	1343	1520	1246	815	478
1994-95	1705	1051	2445	1662	2179	1227	798	1293	723	531
1995-96	1434	1012	1920	1463	2075	1207	...	1110	...	505
1996-97	...	...	...	...	...	...	...	...	...	...
1997-98	2008	1172	1419	1413	2247	1315	...	1299	...	553
Punjab										
1993-94	3522	1593	...	...	...	...	4072	2256	1205	768
1994-95	3419	1295	...	...	...	...	4143	2427	1132	819
1995-96	3147	1467	...	...	...	...	3936	2084	1144	792
1996-97	...	1854	...	...	...	...	...	...	...	...
1997-98	3414	...	...	...	...	...	...	...	...	...

Source: *Area and Production of Principal Crops in India, 1997-98*, Govt. of India.

12. The main reason for this yield gap is the relatively slow spread of modern technology in Assam and the progress made in the use of modern farm inputs. Table 7.9 presents some data on the use of high yielding variety (HYV) seeds in paddy cultivation and fertilisers in Assam, Punjab and in the country as a whole. The relative backwardness of agriculture in Assam stands out clearly. Just about half of paddy cultivation in Assam is using HYV seeds, with very little change observed over the last two decades. Though fertiliser use in Assam has grown over time, it is still very low at about 14 kilograms per hectare in Assam in 1996-97 compared to the national average of 74 kilograms per hectare.

Table 7.9: HYV seeds adoption rates and fertiliser usage

Year	Paddy area under HYV (%)			Fertiliser consumption (kg/ha)		
	Assam	Punjab	All-India	Assam	Punjab	All-India
1980-81	25.4	93.0	45.4	2.8	111.4	31.9
1981-82	39.0	95.0	48.4	3.3	118.4	34.3
1982-83	41.1	94.9	49.2	3.8	128.9	37.1
1983-84	42.8	95.5	52.7	5.0	142.1	42.9
1984-85	44.4	96.3	55.3	3.9	149.4	46.6
1985-86	41.2	95.1	57.1	4.6	153.4	47.5
1986-87	45.0	94.5	58.4	4.8	154.6	49.0
1987-88	41.2	88.8	57.3	6.7	151.7	51.4
1988-89	46.1	94.3	60.9	7.3	151.0	60.6
1989-90	51.5	94.8	62.0	6.6	154.9	63.5
1990-91	40.3	94.2	64.2	10.4	159.7	67.5
1991-92	45.5	93.9	65.5	9.6	165.6	69.8
1992-93	47.6	92.3	65.8	7.2	158.8	65.5
1993-94	46.3	92.4	67.5	5.0	157.4	66.3
1994-95	49.0	92.9	72.0	10.3	167.0	72.1
1995-96	49.9	94.4	73.2	13.5	155.8	74.4
1996-97	57.1	94.5	77.2			

Notes: Ratio of fertiliser consumption (N+P+K) to the total gross cropped area are reported.

Source: *Fertiliser Statistics* various issues.

13. Why has agriculture in Assam lagged behind the rest of the country? What are the constraints to agricultural development in Assam? Why has the spread of modern technology been slow in Assam? What is the potential for commercialization of agriculture in Assam? What should be the government's policy and priorities? These questions are explored in the following sections. The chapter ends with a summary of action plan for agricultural development in Assam.

7.3 Constraints to Agricultural Development in Assam

14. The constraints to agricultural development in Assam can be broadly categorized into the following types:

- Agronomic / environmental constraints.
- Constraints to adoption of modern farming techniques.

- Social / institutional constraints.

15. The situation in Assam with respect to each of these constraints is discussed below.

7.3.1 Agronomic / Environmental Constraints

16. The main agronomic / environmental constraints to agriculture in Assam are (a) soil conditions, (b) short sunshine hours, (c) excessive humidity, and (d) frequent floods.

17. Assam has a wide variety of soils. Soil in the Central and Lower Brahmaputra valley varies from alluvial to sandy loam. The Upper Brahmaputra valley and Barak valley consist of clayey loam, alluvial and red alluvial soils, while in the hill districts it is laterite. The soil condition in most parts of the state is acidic. The distribution of acidic soils in different parts of Assam is estimated to range between 75 per cent to 100 per cent (Assam Agricultural University, 1990). Such highly acidic conditions combined with poor nutrient status, particularly in the Upper Brahmaputra valley, limits the crop varieties that can be cultivated.

18. Assam frequently witnesses overcast sky resulting in short sunshine (bright) hours, which reduces the photosynthetic efficiency of the high yielding varieties. Assam also receives abundant rainfall during the kharif season as a result of which humidity levels are very high. The hot and humid conditions during kharif season favours spread of pests and disease, resulting in crop losses. The excessive humidity conditions also implies that the grain harvested during the kharif season often contains a higher than acceptable level of moisture, because of which sometimes farmers are forced to sell their output at a very low price.

19. Over and above all these, the sate is also subject to frequent floods and extensive water logging. Frequent fioods, mainly during the kharif-cropping season, exposes farmers in Assam to severe risk of crop and property loss. Besides, floods also introduce uncertainty in the length of the kharif-cropping season.

20. Under these agronomic and environmental conditions, farmers have adopted a risk averse strategy of not using purchased inputs such as HYV seeds, fertilisers, pesticides, etc. As a result, the kharif crop in Assam has been more for subsistence purposes and less so for commercial purposes.

21. Most of these problems are well known and so are the possible solutions. The Assam Agricultural University (AAU), Jorhat, has formulated scientific response to these problems. The thrust of these plans is the development of alternative cropping system and production technologies that can effectively bypass these natural constraints. Separate cropping systems have been proposed for different soil and flood situations found in different parts of Assam. These cropping systems are centered on rice with tea, oilseeds, fruits and vegetable forming the periphery. Appropriate short duration varieties with high photosynthetic efficiency and pest / disease resistance capability have been developed for rice to suit the proposed cropping pattern. Further, appropriate combinations of crop cultivation and animal farming (fishery, livestock, poultry, silk worm breeding, and the like) have also been developed suitable for different agronomic

conditions in the state. Details of these plans / strategies can be found in the various AAU reports cited in the reference and are hence not repeated here. The Planning Commission and various other official Committees too have recommended the adoption of these scientific solutions (see, for example, the Jain Committee Report on Economic Development of Assam, and also the Shukla Commission Report on Transforming the North-East).

22. The critical question here is - have the farmers in Assam adopted these scientific cropping patterns and modern farming techniques? The answer, unfortunately, is largely no. As seen earlier, spread of HYV seeds and fertiliser usage has been very low in Assam. This clearly indicates that the slow speed of adoption of modern farming techniques is really the major problem in Assam. Why has the spread of modern technology been slow in Assam?

7.3.2 Constraints to adoption of modern farming techniques

23. The literature on adoption of modern technology in agriculture has stressed the role of price and non-price factors in determining farmers' adoption decisions. Price factors refers to the relative profitability of cultivating a particular crop / variety. Thus both the output and input prices matter here. Government's policies with regard to the pricing of various crops and farm inputs, stocks and trade (both domestic and external), play a crucial role in determining the relative profitability of various crops. Arguably, the government's policy of providing subsidized farm inputs (such as fertiliser, irrigation and power) and the efficacy of the government's procurement system in states such as Punjab, Haryana, Uttar Pradesh, Andhra Pradesh, et cetera, were critical factors that accelerated the spread of modern farming technologies in those states; whereas the relative failure of the procurement system in Assam has been a missing link responsible for the slow progress in technology adoption in Assam. Thus, while there may be scope to improve the functioning of the procurement system in Assam, recent experiences (namely, high procurement prices leading to build-up of huge stocks, far above available storage capacity and any sensible buffer stock requirements) suggest that the support price – procurement policies themselves may be fiscally unsustainable and may need drastic reforms.

24. Similarly, many studies have drawn attention to the negative impacts of providing subsidized farm inputs, namely the inefficient use of these inputs in many of the agriculturally advanced states often resulting in environmental problems such as land degradation, water logging, etc. Thus, there is a need to reform these input subsidy policies too both for improving input use efficiency and reducing the fiscal burden that they impose. Besides, India's commitments to the World Trade Organization (WTO) are likely to impose further disciplines on the policy of subsidizing farm inputs and maintaining a support price through a procurement system. In sum, one may expect government intervention with regard to input and output prices to reduce over the years and farmers would increasingly have to rely on market signals in their decision-making. The role for the government, if any, may be in ensuring that markets function

efficiently and that market signals are transmitted efficiently to farmers to enable them to make right decisions.

25. Amongst the non-price factors, irrigation development, credit availability, and access to markets, amongst others, have often been cited as critical determinants of technology adoption. Table 7.10 reports some data on irrigation potential created and utilized in Assam. Out of an ultimate irrigation potential of 2870 thousand hectares only about 481 thousand hectares of irrigation potential have been created by 1996-97. The irrigation potential created is only about 17 per cent of the net sown area in Assam.

26. The underdeveloped status of irrigation potential is not due to a want of plans / intention on part of the Government, but a case of targets not being achieved. This comes out clearly from the data reported in Table 7.11. Year after year ambitious targets for irrigation development are routinely set with scant regard for the realization of those targets. The reasons for this could be many including improper project planning, insufficient provisioning of funds, lapses in implementation / supervision / accountability, etc.[1]

27. More worrisome is the fact that utilization of the irrigation potential created has declined over the years (See Table 7.10) and is less than 25 per cent in 1996-97.[2] Such low utilization rates mean that most of the crops are cultivated under unirrigated conditions. For example, only about 22 per cent of rice cultivation is under irrigation, a figure that has hardly changed over the last two decades (See Table 7.10). While many reasons are hypothesized in the literature (for example, see Khound and Borthakur, 1999) for the low utilization rates, such as problems of stray cattle, labour shortage, cultural inhibitions, lack of proper distribution channels to carry water from the distribution channels to the farmers' fields, and lack of suitable cropping pattern, the latter two are probably the most plausible ones.

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1 Indeed, the official comments by the Assam State Government on an earlier draft of this chapter is an indirect admission to this effect. To quote, "Since Independence, Government has been putting more emphasis on development of agriculture because this sector contributes lion's share to the total economy. But inspite of that, the progress in agriculture has not been achieved to the extent desired. The main factor in this regard is perhaps poor delivery system and poor performance of economic and administrative governance."

2 Here it is worth recalling the problems with the data on irrigation. Given the uncertainty surrounding the data, it is quite possible that the high utilization rate observed in the earlier years is a statistical artefact.

Table 7.10: Irrigation potential and utilisation

Year	Irrigation potential in Assam			Rice area under irrigation (%)		
	Created	Utilized	Utilisation	Assam	Punjab	All-India
	(ha)	(ha)	rate (%)			
1980-81		118563		23.4	98.2	40.7
1981-82		145279		23.6	98.1	42.0
1982-83		157925		23.1	98.7	42.0
1983-84	280274	165199	58.9	23.0	98.7	42.3
1984-85	311107	172112	55.3	22.9	98.6	43.0
1985-86		203011		21.6	98.8	43.0
1986-87		225757		23.3	97.6	44.1
1987-88		222451		22.8	99.1	43.7
1988-89		235331		23.1	98.7	44.9
1989-90		223711		21.8	99.0	45.6
1990-91		239193		21.4	98.7	44.9
1991-92		227263		21.0	99.0	46.7
1992-93	455650	214922	47.2	21.1	99.4	48.1
1993-94	466498	129950	27.9	21.1	99.2	48.8
1994-95	477011	147249	30.9	21.7	99.8	50.0
1995-96	480078	113088	23.6	21.3	99.8	50.1
1996-97	480590	114100	23.7			

Notes: a) Data on irrigation potential created are as on March of each year, and do not refer to the potential created during the year.
b) Data on irrigation potential utilised are for each year.
c) Irrigation utilisation rate for any year is the ratio of irrigation potential utilized in that year to irrigation potential created as on March of that year (expressed as %).
d) Data on irrigated area under rice for Assam has not been updated since 1953-54, and hence the percentage irrigated acreage for rice reported above should be interpreted with caution.

Source: a) Data on irrigation potential for Assam (created and utilized) are from *Statistical Handbook of Assam* , Govt. of Assam.
b) Data on rice irrigation are from *Fertiliser Statistics* , various issues.

Table 7.11: Progress in irrigation development through Government schemes

	Ultimate potential (000 ha)	1996-97 Target (ha)	1996-97 Achievement (ha)	1997-98 Target (ha)	1997-98 Achievement (ha)
Minor irrigation	1900	5300	512	5300	334
Major/medium irrigation	970	7000	0	200	0
Total	2870	12300	512	5500	334

Source: a) Data on ultimate potential are from *Indian Agriculture in Brief*, Govt. of India., 27th Ed., 2000.
b) Data on target and achievement are from *Statistical Handbook of Assam* , Govt. of Assam, various issues.

28. Credit availability is another major problem in Assam. The low overall credit-deposit ratio amongst banks in Assam has been commented upon by many authors and has been discussed elsewhere in this report. In such a situation agriculture is no exception to this as can be seen from the data presented in Table 7.12. It is seen that credit

disbursement per hectare (at 1980-81 prices) in Assam is far below the national average. Moreover, it has fallen over time in Assam, which is contrary to the trend observed at the national level. As a result, by 1996-97 per hectare credit disbursed in Assam was only about 30 per cent of the national average, a fall from about 60 per cent of the national average in 1988-89. Under such tight credit situation, farmers in Assam would be unable to adopt modern farming techniques that are intense in purchased inputs.

Table 7.12: Credit advanced to agriculture (at 1980-81 prices)

Year	Assam			Punjab			All-India		
	PACS	SCBs	Total	PACS	SCBs	Total	PACS	SCBs	Total
	(Rs. in Crores)		(Rs./ha)	(Rs. in Crores)		(Rs./ha)	(Rs. in Crores)		(Rs./ha)
1988-89	3.6	116.1	343.2	230.0	502.1	989.7	2641.9	8157.0	592.4
1989-90	3.9	130.1	374.2	286.7	497.2	1060.4	2714.7	8195.2	598.2
1990-91	4.9	111.4	320.5	208.8	539.2	997.0	1764.7	8250.6	538.7
1991-92	3.6	112.7	315.2	249.2	500.4	997.1	2069.7	7834.2	543.4
1992-93	1.1	96.4	266.4	435.7	461.1	1187.5	3348.7	7877.4	604.8
1993-94	0.8	90.0	249.3	429.9	460.4	1168.0	3301.1	7463.7	576.9
1994-95	3.0	94.8	272.4	424.3	475.3	1169.4	2784.1	7406.6	541.6
1995-96	0.3	87.5	240.8	317.2	458.3	1000.5	2875.5	7905.4	758.1
1996-97	0.1	86.8	237.9	354.4	471.5	1053.1	3085.3	8171.2	788.2

Notes: a) PACS refers to Primary Agricultural Credit Societies
b) SCBs refers to Scheduled Commercial Banks
c) Credit figures are adjusted for inflation using GDP deflators at 1980-81 prices

Sources: a) *Indian Agriculture in Brief* (various issues), *CMIE, 1998* , and *National Accounts Statistics of India* (various issues).
b) Calculations are by Goyari (2000).

29. Lack of markets and storage facilities is another major problem afflicting agriculture in Assam. From Table 7.13 it can be seen that Assam has in all only 34 regulated markets of all types, whereas Punjab has 667 such regulated markets and even Haryana has 273. Further, even in the few regulated markets that exist in Assam, various infrastructures necessary for such markets to function efficiently are mostly lacking as can be seen from the data presented in Tables 7.14 and 7.15. Besides marketing facilities, Assam is also severely lacking in storage facilities for agricultural products. This fact comes out clearly from the data in Table 7.16.

Table 7.13: Number of regulated markets

	As on 31-3-1981			As on 31-3-1994		
	Principal markets	Sub-market yards	Total	Principal markets	Sub-market yards	Total
Assam	7	9	16	15	19	34
Punjab	119	228	347	143	524	667
Haryana	88	90	178	99	174	273

Source: *Bulletin of Food Statistics, 1981-82 and 1994-95*.

Table 7.14: Infrastructural facilities created in principal and sub-market yards in Assam

Facilities (No.)	Principal market	Sub-market
Administrative building	11	-
Staff quarters	15	1
Godown	9	2
Auction platform / hall	12	8
Auction hall-cum-godown	-	4
Guest house	2	-
Internal roads / tubewells / toilets	provided in 9 market places	-
Buying and selling complex	4	-
Chowkidar's quarter	-	1
Total number of markets	15	19

Notes: The table reports the faicilities created up to March 1997.

Source: Reproduced from Khound and Borthakur, 1999.

Table 7.15: Additional infrastructural facilities provided in the principal and sub-market yards in Assam

Facilities	No.
Retailers shed	9
Fish-cum-vegetable shed	1
Retailers shop	3
Ring well	1
Market complex	1
Auction platform	9
Tubewell	1
Jute grading units with bailing press and grading shed	4

Notes: The table reports the faicilities created up to March 1997.

Source: Reproduced from Khound and Borthakur, 1999.

Table 7.16: Central and State warehousing corporations

	As on 31-03-1998	As on 31-03-1999	As on 30-09-1999
Central warehousing corpn.			
Number	6	6	6
Storage capacity (000 tonnes)	45	45	47
State warehousing corpn.			
Number	40	40	40
Storage capacity (000 tonnes)	240	249	250

Source: *Basic Statistics of North Eastern Region, 2000* , North-Eastern Council, Shillong, quoting *Central Warehousing Corporation, New Delhi* .

30. The lack of marketing and storage facilities puts the farmers in Assam at a great disadvantage in comparison with their counterparts elsewhere in the country. With few markets to sell their output, farmers have little incentive to improve productivity and production by adopting modern farming techniques and increasing input use efficiency. This can be one more reason for the abysmally low irrigation utilization rate in Assam seen earlier.

31. Indeed this aspect came out clearly from the interactions that this team had with farmers in a village that we visited in November 2000, close to Nagaon town. This

village is one of the beneficiary villages where the shallow tubewells programme has been implemented. The positive results from the irrigation scheme were to be seen all over this village, where farmers said they were now able to cultivate three crops in a year. When enquired about the problems that they now face, most of the farmers cited the lack of markets and the consequent low price for the vegetables and fruits that they were now able to cultivate. Clearly, lack of commercialization opportunities is hindering agricultural growth in this village. If this is the situation in a village not very far from a town (where one may expect the markets for farm produce to be fairly large) the fate of more remote villages needs no further description.

32. Besides the above agricultural infrastructure, the lack of general infrastructure such as roads, transportation network, communication, et cetera, has been commented elsewhere in this report. These too exert an adverse pressure on agriculture by imposing high transaction costs on farmers, while purchasing inputs and selling their output. The high transaction cost reduces their profitability and it is no surprise that technology adoption has been slow in such adverse conditions.

7.3.3. Social / Institutional Constraints

33. Agriculture in Assam is also subject to various social and institutional constraints. The most obvious such constraint is the land holding pattern, which is dominated by smallholdings / small operational size of farms (See Table 7.17). Nearly three-fourths of all operational holdings are either 'marginal' (that is, less than 2 hectares) or 'small' (that is, between 2 and 4 hectares). As a result, the average size of holdings in Assam is only about 1.27 hectares.

Table 17: Number, area and average size of operational holding in Assam, 1990-91 (all social groups)

Size / Class	Number of	Operated area		Average size
(hectares)	holding	hectares	% in total	of holding
Marginal				
< 0.02	7497	115	0.004	0.02
0.02 - 0.5	906999	208300	6.5	0.23
0.5 - 1.0	606337	398707	12.4	0.66
1.0 - 2.0	559863	784081	24.5	1.40
Small				
2.0 - 3.0	237135	566720	17.7	2.39
3.0 - 4.0	105420	351277	11.0	3.33
Semi-medium				
4.0 - 5.0	49567	210999	6.6	4.26
5.0 - 7.5	38267	224140	7.0	5.86
7.5 - 10.0	6864	56472	1.8	8.23
Medium				
10.0 - 20.0	3051	39503	1.2	12.95
Large				
> 20.0	2379	364438	11.4	153.19
All sizes	2523379	3204751	100.0	1.27

Source: *Statistical Handbook of Assam, 1999*, Govt. of Assam.

34. Small / marginal farmers typically face severe capital constraint. Capital scarcity limits their capacity to adopt modern technologies that are intensive in purchased inputs and also often require a lot of on-farm investments on land, water and pest management, etc. Small farm size can also limit the scope for undertaking commercial farming. Under such a situation, it is a common practice for small farmers to operate on leased land. The nature of tenancy contracts then is a critical determinant for farmers / landowners to invest on land improvement and on modern farm inputs.

35. The problems arising out of the land holding pattern, tenancy contracts, etc., are, of course, faced by the country as a whole and are not really peculiar to Assam. Land / tenancy reforms really is the solution in the long run. Land reforms are filled with political problems and gains are unlikely in the short-run. Political determination on part of the government is the key and that is nowhere in sight both at the Centre and in most of the states, including Assam.

36. One alternative here is for the small / marginal farmers to organize themselves into groups such as cooperatives, village committees, etc. Under such a farmers' organization, they would collectively be better placed to access capital from the organised financial sector than in their individual capacity. Indeed the benefits of such farmers' organization can extend to other markets such as for outputs, inputs, and even improve access to agricultural research extension services. In Assam there is a programme to encourage farmers to organize themselves into groups called Pathar Parichalana Samity or Field Management Committee (FMC). The functioning of such FMCs is discussed in more detail later in this chapter.

37. While land holding pattern is a national level problem, there is one particular social / institutional problem which is peculiar to Assam (and to other North-East states), namely, the widespread prevalence of Jhum or shifting cultivation in the two hill districts of the state. This is a rather primitive farming technology that causes enormous environmental damage. The problem, however, is a socio-economic problem and is really a livelihood strategy for the people living in hilly terrain. This too is a long-run problem, whose solution lies in improving the education standards of people in these regions, and more fundamentally in providing alternative sources of livelihood to them.

38. Given the various constraints to agriculture discussed above, what should be the strategy for agricultural development in Assam?

7.4 Strategy for Agricultural Development in Assam

39. A strategy for agricultural development in Assam should be built around two elements, namely, (a) promoting the rabi season as the engine for agricultural growth in Assam, and (b) aggressively pushing for commercialization of agriculture in Assam.

40. As seen earlier, agronomic factors in Assam does limit the crop varieties that can be cultivated. The kharif season, which is the main cropping season in Assam, is subject to various natural risks such as floods and high humidity, and farmers have practiced a risk averse strategy of not using purchased inputs such as HYV seeds, fertilisers,

pesticides, etc. As a result, the kharif crop in Assam has been more for subsistence purposes and less so for commercial purposes. The rabi season, on the other hand, is generally free from the problems of flood and high humidity. In such a situation, rabi season can emerge as the engine for agricultural growth in Assam. Government policies over the next decade must aim to increase the acreage in the rabi season and promote modern farming techniques.[3] To achieve this, development of various agricultural infrastructures, particularly irrigation, marketing and storage, is the key and government certainly has a very important role to play in this regard.

41. The liberalization process / economic reforms taking place in the country is putting a lot of stress on private initiative and the importance of market forces as keys to achieving high economic growth. This implies that future growth of different sectors and of different regions will be determined in accordance with their comparative advantage. Sectoral and regional growth will depend entirely on their capacity to trade, both domestically and externally. This would require that the production structure should be oriented towards catering to demand, with emphasis on quality, quantity and timeliness. Commercialization is the key to future agricultural development of Assam. Government policies must be designed with a view to improve the commercial potential of the sector.

42. There are two aspects to commercialization of agriculture in the context of Assam. First, transforming from production for self-consumption to production for the market. Second, shifting towards crops with a high commercial value. The first aspect requires improving efficiency and productivity levels so that farmers from Assam can compete effectively in the market. This in turn requires rapid progress in the adoption of modern farming techniques, to facilitate both public and private investments in various agricultural infrastructures.

43. The second aspect involves identifying crops in which Assam has a comparative advantage, and encouraging their cultivation. As seen earlier rice is the most dominant crop in Assam. Can Assam hope to become a major producer of rice in the country given the present state of glut in rice production in the country? The answer is yes, in the medium- to long-run, though in the short-run the present glut situation in the country as a whole does pose a problem. This glut situation is unlikely to persist in the future once farmers all over the country adjust their cropping decisions in response to the present situation. Perhaps what is critically more in favour of Assam is the very transport disadvantages that Assam and other North-East states face. The transport disadvantage is such that it would definitely be cheaper to transport rice from Assam to the rest of the North-East than from far away Punjab or Andhra Pradesh. Assam only has to get its act together and become an efficient and low-cost producer of rice and it can emerge as the granary for the entire North-East and perhaps also supply to

[3] In the comments to an earlier draft, concern over the environmental impact of using chemical fertilisers and pesticides were expressed. While these concerns are valid and cannot be ignored, it is probably too premature for Assam to worry about this issue given the current very low levels of use of these chemical inputs, compared even with the national average. Herein, perhaps is an opportunity for Assam to go for more environment friendly chemical inputs and application techniques, so that environmental concerns are addressed to at an early stage in agricultural development.

neighbouring countries such as Bangladesh, Bhutan and Nepal. One can hence safely assume that there is tremendous potential for rice in Assam.

44. But rice is not the only crop on which Assam should concentrate. As seen earlier (See Table 7.6), there is still enormous potential for increasing the acreage under fruits, vegetables, tea and spices. These are the crops in which Assam already has a fairly significant market power in the country. These are the crops on which Assam should concentrate. This is a first step towards exploiting the untapped potentials for commercialization of agriculture in Assam. Vegetables, fruits and spices are high value crops with enormous scope for commercialization. Many processed food products such as chips, semi-processed / frozen vegetables, juices, jams, spice preparations, etc. can be produced using these crops as raw materials. These processed food products in general command a high price and they have enormous market both domestically and externally. Besides, processed food products have storage and transportation advantages over raw products, a factor of particular concern to Assam suffering from transportation / connectivity problems. These food-processing industries do not necessarily have to be large industrial units, but can even be small-scale units (even household operations) with enormous scope for local employment. The government should, therefore, aggressively promote such agro-processing industries in Assam.

45. Action plan to achieve these two elements of the strategy would require massive effort in developing irrigation, marketing and storage facilities besides general infrastructure such as roads, railways, waterways, telecommunication, power, etc., all of which Assam currently lacks to a very great extent.

46. As seen earlier, enormous untapped potential for both surface and ground water irrigation still exists in Assam. Only about 17 per cent of the ultimate irrigation potential has been developed in Assam so far. In the short-run, groundwater irrigation has to be promoted. Groundwater based irrigation provides high quality irrigation and can lead to productivity growth. In the context of Assam, assured irrigation from ground water sources would help promote rabi crop. Besides, these facilities can be created in a fairly short period of time. It is widely claimed that the shallow tubewell program has worked well in Assam. Though these claims need to be verified, if found to be true, it clearly is a justification for accelerating the development of ground water based irrigation.[4] Simultaneously, surface water irrigation too should be developed, though these may come into use only over the medium- and long-run. This is essential to achieve geographical spread of the rabi crop across different parts of Assam. While developing these surface water irrigation systems care should be taken to integrate them with flood control / management systems.

47. Commercialization of agriculture requires establishing markets and trading centres with adequate storage facilities close to production centres. There cannot be commerce unless there are markets. Without commerce value addition will not take place and low-incomes, poverty and unemployment would be the end result. Indeed the low

productivity levels of irrigated agriculture in Assam seen earlier can be attributed to the absence of commercial opportunities that markets and trading centres would throw open.

48. Regulated markets and trading centres with adequate storage facilities, provide a space where farmers, traders, and in a limited way even retail buyers can interact in the price discovery process. This is essential for farmers to respond to market signals. Markets and trading centres have to be close to the production centres. Else farmers being mostly unorganized would lose out to the relatively more organised traders, especially on account of transport costs. Faraway markets offer very little incentive for commercial production and in such a situation farmers would restrict their cultivation to meet their self-consumption needs. It is high time that the government and development planners recognize that markets, trading centres and storage facilities are complementary 'commercial' infrastructure to irrigation facilities, which is a 'technical' infrastructure, and should be developed along with irrigation facilities.

49. The government should invest in developing regulated markets and trading centres with adequate storage facilities across the entire state. Developing such market centres in a short period should be fairly easy. The target should be to at least double the number of such markets in Assam over the next three years and to attain a level comparable to Punjab or Haryana within a decade. This would provide a far better incentive to farmers to adopt modern technologies essential for commercialization than using the same resources for providing subsidized fertilizer, irrigation and other farm inputs.

50. The role of private sector must be recognized here. Private sector may be expected to play a major role in the development of ground water based irrigation systems as such systems typically allow full control to the private agent investing in them. On the other hand, major / medium irrigation projects have many of the characteristics of public goods, and hence would not attract private investments. It is then primarily the responsibility of the government to develop such major / medium irrigation systems. Similarly, the private sector is unlikely to take initiative in developing general-purpose agricultural markets and marketing yards, though some narrow private channels of trade might emerge over time. Here too, the initiative has to come primarily from the government.

51. As argued elsewhere in this report, the government has important role to play in creating a facilitating environment for private initiative to flourish, by providing various social services, infrastructure and good governance. With appropriate policies, agriculture in Assam can grow much faster than it has in the past and realize its full potential.

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[4] The institutional structure conducive to the success of the Shallow Tubewells programme is assessed by Sharma in this report.

7.5 Summary of Action Plan

52. The action plan for agricultural growth should involve the following:
- Promote rabi season as engine for agricultural growth.
- Aggressively push for commercialization of agriculture.
- Production for market as opposed to production for self-consumption (as is the case now).
- Promote rice, tea, vegetables, fruits, and spices.
- Develop linkages with downstream local food processing industries.
- Invest in agricultural infrastructure.

53. For development of irrigation, the following actions are needed:
- Ground water irrigation – shallow tubewells with appropriate institutional structures.
- Surface water irrigation – for promoting the geographic spread of rabi season and for flood control.
- Marketing and storage facilities.
- Start in all those regions where the shallow tubewells programme has been initiated.
- Double the number in three years.
- Attain the level in Haryana within a decade.
- The ultimate objective should be to have a regulated market / trading centre with storage facilities close to every village (say within 20 to 25 km – so that a farmer can make a same-day round-trip to the market to sell his produce).

7.6 Shallow Tubewell Programme: Impacts and Institutional Reforms

54. Agriculture is the primary occupation for almost 70 per cent of the total main workers of Assam, and their income depends primarily on production of foodgrains, especially rice. Due to the suitability of climate, soil and abundant rainfall, rice occupies about 70 per cent of the gross cropped area and more than 90 per cent of the total area under foodgrains. Nevertheless, Assam has been chronically suffering from food deficit since the early 1960s due to considerably high growth of population in the state combined with almost unchanged land productivity. Similarly, contribution of the agricultural sector to the aggregate State Domestic Product has also been sharply declining without any appreciable reduction in the number of people dependent on the sector. The disappointing performance of the agricultural sector can be attributed to small holdings, low cropping intensity, low productivity, low level of technology, inadequate irrigational facilities besides recurrent floods (and at times drought) which affect large chunk of area under crops in the state resulting in a staggering loss almost every year. With this backdrop, this chapter analyzes the impacts of the measures recently initiated by the government of Assam to accelerate agricultural development in the state.

7.6.1 Strategy Adopted for Development of Agriculture

55. Considering the importance of agriculture in the state's economy, the topmost priority of the government of Assam has been on development of this sector. Achieving self-

sufficiency in production of foodgrains has been the primary objective of the government and the basic strategy is to enhance productivity by increasing cropping intensity per unit area and yields through use of high yielding variety seeds, fertilizers and improved agricultural practices. These efforts have been directed to increase the area under double cropping by bringing in more area under rabi, pulse and oilseeds.

56. Thus, this strategy essentially demands more emphasis on rabi crops and considering the uncertainty in the occurrence and the disparity in the distribution of rainfall in the season, assured irrigation facility is undoubtedly the most important prerequisite for a breakthrough in the agricultural sector of Assam. A rational approach for development of irrigation in the state, first of all, demands more reliance on utilization of the abundant ground water, and it requires a shift of emphasis from major and medium irrigation projects, which are mainly based on surface water, to installation of shallow tubewells (STW). Secondly, considering the overwhelming domination of the small and marginal farmers besides fragmentation of holding and the existing land tenure system in the state, optimum use of the ground water resource requires a new institutional arrangement. Taking into account mainly these two aspects, the government of Assam in its recent policy to promote agricultural development in the state has emphasized on (a) creation of irrigation potential through installation of shallow tubewells, and (b) establishment of Field Management Committees (FMC) in every village.

7.6.1.1 Shallow Tubewell Programme

57. Implementation of irrigation plans and programmes in Assam started during the First Five Year Plan itself with a couple of medium surface irrigation projects, and the government of Assam continued to emphasize surface irrigation schemes during the successive five-year plan also. Nevertheless, ground water irrigation started getting priority from the Fifth Five Year Plan. By the end of the Eighth Five Year Plan, the government of Assam implemented a number of irrigation projects including installation of 61,428 shallow tubewells covering different parts of the state. The impacts of all such efforts, however, were far below the expected level. Till 1996-97, the state had about 527 thousand hectares of net irrigated area which constituted only about 21 per cent of the net sown area against 38.61 per cent of the national average. Similarly, only about 14 per cent of the gross cropped area of the state could be irrigated against the national average of 38.66 per cent (CMIE, November 2000).

58. In 1996-97, the government of Assam enthusiastically initiated the scheme of installation of shallow tubewells under Samriddha Krishak Yojana (SKY) with finance from NABARD and Assam Rural Infrastructure and Agricultural Service Project (ARIASP) financed by the World Bank to accelerate the pace of agricultural development in the state. The government of Assam has aimed and installed 1,47,250 STWs (1,00,000 under SKY and 47,250 under ARIASP) by March 2001, and the primary objective of the scheme has been to increase the area under assured irrigation for increasing productivity and cropping intensity so as to bridge the gap between

production and requirement. Considering the technical and geo-hydrological parameters, 18 out of the total 23 districts of Assam have been selected for this scheme.

59. The total cost of each STW including the installation charge is approximately Rs 23,000/- of which the share of the government is two-third while the balance has to be borne by the beneficiaries. It may also be mentioned that 90 per cent of the total STWs under ARIASP are to be given to FMCs and only the remaining 10 per cent may be given to interested individuals. In case of NABARD, all the STWs are to be given to the FMCs.

7.6.1.2 FMCs as Agents of Agricultural Development

60. It is, therefore, explicit that the STW scheme has been a collective effort of the state government, financial institutions and FMCs constituted by the end users. A Pathar Parichalana Samity or Field Management Committee is an organization of a group of not less than 20 and not more than 80 farmers actively engaged in land-based activities carried out on a contiguous plot of cultivable land (pathar) measuring 500 bighas (nearly 67 hectares), except in those cases where the contiguity of the area is limited by geographical barrier like rivers, hills, terrain etc. But, in no case the area of the contiguous cultivable land can be less than 300 bighas (40 hectares). The primary objective of this institutional arrangement is to make optimum utilization of the potentialities of the cultivable land leading to enhancement of production and productivity of various crops.

61. As per the norms laid down by the Government of Assam, the FMCs should install the STWs by themselves under constant supervision of the officials of the Directorate of Agriculture. The FMCs are also given the responsibility to purchase the required materials such as pipes, strainers, etc. at a rate and quality prescribed by the Directorate of Agriculture except pumpsets which are purchased centrally by the state government. Similarly, the FMCs are also responsible for any damage, loss and theft of the STWs and can seek legal steps, if necessary, with an intimation to the Department of Agriculture.

7.6.2 Impacts of the STW Programme

62. Installation of the STWs in different parts of Assam involving the FMCs has certain visible impacts on the agricultural sector of the state. Beyond any doubt, the programme has been successful to create an additional potential to irrigate about 294 thousand hectares or approximately 13 per cent of the net sown area in the state. Table 7.18 shows distribution of the STWs in different districts of Assam covered under the programme and the additional irrigation potential created by the STWs in each district. However, the programme has not succeeded in achieving the stated objective of achieving self-sufficiency in production of foodgrains.

Table 7.18: Dynamic Ground Water Resource Potential of Assam and the Numbers of Shallow Tube Wells Installed in Different Districts

Sl. No.	District	Gross dynamic ground water resource (mcm)	Drinking water 15% mcm	Utilizable ground resource (mcm)	Feasible nos. Of Shallow Tube Wells based on 100% utilizable resource and 0.0216 mcm annual draft	Net area sown (hectares)	Total number of STWs installed till June, 2001	Irrigation Potential created		Balance STWs feasible	Potential to be created	
								(hect)	As % of net sown area		Area (hect)	As % of net sown area
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Dhubri	1,205.06	180.76	1,024.3	47,421	146788	20798	41596	28.34	26623	53246	36.27
2	Bongaigaon	622.21	93.33	528.88	24,485	93203	10789	21578	23.15	13696	27392	29.39
3	Kokrajhar	949.76	142.46	807.3	37,375	85638	3850	7700	8.99	33525	67050	78.29
4	Goalpara	565.41	84.81	480.6	19,935	79260	7442	14884	18.78	12493	24986	31.52
5	Barpeta	1,133.88	170.08	963.8	44,620	170915	12406	24812	14.52	32214	64428	37.70
6	Nalbari	866.33	129.95	736.38	34,091	146499	12508	25016	17.08	21583	43166	29.47
7	Kamrup	1,035.44	155.32	880.12	39,357	182258	15206	30412	16.69	24151	48302	26.50
8	Darrang	1,121.73	168.26	953.47	44,142	203596	11500	23000	11.30	32642	65284	32.07
9	Sonitpur	1,530.73	229.61	1,301.02	60,237	162597	5763	11526	7.09	54474	108948	67.00
10	Lakhimpur	707.8	106.17	601.63	27,853	87366	1901	3802	4.35	25952	51904	59.41
11	Dhemaji	1,023.65	153.55	870.1	40,282	55821	1360	2720	4.87	38922	77844	139.45
12	Morigaon	386.38	57.96	328.42	15,204	99738	6908	13816	13.85	8296	16592	16.64
13	Nagaon	1,309.23	196.38	1,112.85	51,520	232837	17476	34952	15.01	34044	68088	29.24
14	Golaghat	1,111.15	166.67	944.48	43,725	117134	5091	10182	8.69	38634	77268	65.97
15	Sibsagar	1,140.88	171.13	969.75	44,895	126106	3700	7400	5.87	41195	82390	65.33
16	Jorhat	938.88	140.83	798.05	36,946	113925	3172	6344	5.57	33774	67548	59.29
17	Dibrugarh	1,100.86	165.13	935.73	43,320	125508	4800	9600	7.65	38520	77040	61.38
18	Tinsukia	1,222.29	183.34	1,038.95	48,099	95381	2580	5160	5.41	45519	91038	95.45
Total		17,971.67	2,695.74	15,275.83	703,507	2324570	147250	294500	12.67	546257	1092514	47.00

Source: Columns 3,4 and 5 : Central Ground Water Board, NE Region, Guwahati

Column 7 : Statistical Hand Book, Assam, 2000, Directorate of Economics & Statistics, Govt. of Assam

Column 8 : Department of Agriculture, Govt. of Assam

Columns 9, 10, 11, 12, & 13 : Calculated by the author

63. Expansion of irrigation facility has significantly influenced the cropping pattern, particularly of rice, as it is evident from Table 7.19. With the expanded irrigation facilities, the farmers, particularly of the flood affected areas, are gradually becoming more interested in summer rice for an assured harvest before the monsoon rainfalls. Consequently, the area under summer rice in the state has increased by almost 68 per cent from 1997-98 to 1999-2000 while its production has increased by more than 107 per cent as its average yield per hectare has gone up to 22.19 qtls. in 1999-2000 from 17.97 qtls. in 1997-98. Autumn rice, however, has registered a decline in both area under the crop and its average yield per hectare.

Table 7.19: Area, Production and Productivity of Major Crops in Assam

Crops	1997-98			1998-99			1999-2000		
Rice	A	P	AY	A	P	AY	A	P	AY
a. Autumn	607.40	597.48	10.00	594.97	520.60	8.89	557.22	514.16	9.38
b. Winter	1743.32	2470.95	14.39	1635.23	2288.14	14.21	1793.99	2692.71	15.24
c. Summer	174.97	314.44	17.97	223.91	446.11	19.92	294.65	653.78	22.19
Total rice	2525.69	3382.87	13.59	2454.12	3254.83	13.45	2645.86	3860.65	14.79
Wheat	84.69	110.05	12.99	89.59	90.51	10.10	76.31	97.58	12.79
Maize	19.22	14.72	7.66	19.81	13.96	7.05	19.71	14.06	7.13
Pulse	117.91	64.46	5.47	138.10	74.82	5.42	127.48	70.59	5.54
Oilseed	341.79	173.77	5.49	342.97	174.74	5.09	348.46	174.79	5.02

Source: Department of Agriculture, Government of Assam (2001)

A – Area in 000' hect

P- Production in 000' tonnes

AY – Average Yield in Qtls/hect.

64. Yet, winter rice has been still maintaining its predominant position due to its higher demand notwithstanding its lower average yield compared to summer rice. Winter rice enjoys a preferential advantage in Assam, but its production has been constrained mainly by erratic monsoon rainfall quite often resulting in floods besides use of traditional practices of production with a good probability of flood, use of expensive inputs is naturally avoided by farmers. The decline in the area under winter rice and its average yield in 1998-99 can be attributed to heavy floods in the year, but the area under this crop has again increased in the following year along with a noticeable improvement in its average yield. The total rice production increased by 14 per cent over two years.

65. The increase in area under summer rice coupled with growing concern for higher productivity boosted by assured irrigation, has led to a noticeable increase in consumption of fertilizers in Assam. As Table 7.20 reveals, consumption of fertilizers in the state has increased from 12.48 kg. /hectare in 1995-96 to 27.66 kg/hectare in 1999-2000. Of course, it is still far below the average for the country as a whole.

Table 7.20: Fertilizer Consumption Per Hectare (kg/hectare)

Year	Assam	India
1995-96	12.48	74.38
1996-97	14.02	75.49
1997-98	17.90	85.44
1998-99	18.74	88.49
1999-2000	27.66	95.33

Source: CMIE, November 2000

66. It is, however, evident from Table 7.19 that the STW programme launched by the Government of Assam had very little impacts on both production and productivity of the major crops grown in the state other than summer rice. For a quick assessment of the impacts of the STW programme, case studies of three FMCs belonging to the Chaygaon Agricultural Extension Officer Circle of Kamrup district have been conducted by the author in the second week of June 2001. The important observations that are common to all the three case studies are summarized below:

a. Regarding the area covered by the FMCs and their total number of members, the discrepancies between the official figures and the figures reported by the farmers are noticeable. As per the office records, total 170 families are members of the three FMCs, and their total area of operation is 2170 bighas (290 hectares). But the farmers, who are members of the three FMCs, reported that the total number of members of the three FMCs together is only 129 families. The members of the Executive Committee of two out of three FMCs are ignorant about the actual operational area of their respective FMCs. Nevertheless, the Secretary of the FMC has reported that the actual operational area of his FMC is 125 bigha (16.73 hectares) while the same has been found to be 520 bighas (69.61 hectares) in the office records. In such a situation, the question of contiguity of operational area of each FMC definitely does not arise.

b. As per laid down norms, every FMC should be divided into a number of sub-committees depending on the size of holdings of its members. Each sub-committee should have at least a contiguous area of two hectares that can be irrigated by one STW. To ensure optimum utilization of the irrigation potential of each STW, each such sub-committee is eligible for getting one STW instead of one single household that may not have the required size of land. Each sub-committee should collect the amount required, that is, one-third of the total cost of the STW, from its members on the basis of size of their holding to effect equitable distribution of water and deposit the same to the concerned authority. Keeping in view the small size of holdings, this provision has its own merit. It has, however, been observed that this rational approach of distribution of STWs has been grossly violated in all the FMCs. Officially, the sub-committees are formed and the STWs are given to the sub-committees of

the FMCs. Nonetheless, at the empirical level, the individual farmer who has the capacity to pay the required amount has got the STW in the name of a sub-committee which exist only on paper. Therefore, all the STWs distributed in the three FMCs are individually owned by relatively better off farmers, but hardly a few of them have an operational area of two hectares. Consequently, as it has been found, only about 30 per cent of the total operational area of the three FMCs has been brought under assured irrigation.

c. The irrigation facilities are utilized by all farmers who have STWs, for production of summer rice only. As the area covered by the FMCs is flood prone, the users of the STWs are now interested more in production of summer rice. It is worth noting that with assured irrigation, a farmer with one acre of land under summer rice can now produce some amount of marketable surplus.

d. The users of STWs are found to have basic knowledge about use of chemical fertilizers, pesticides, HYV etc. Nevertheless, most of the farmers have reported they do not get the required support and guidance from the department of agriculture. The Agriculture Extension Officers or the Village Agriculture Extension Workers hardly visit their fields nor remain in their office for providing guidance at the time of need.

e. Some members of the FMCs who do not have their own STWs get their land irrigated by depending on their fellow members who have been provided with STWs under the programme. Approximately 23 per cent of the total members of the three FMCs depend on their fellow members for use of STWs. These household have to pay a fixed amount, that is, 3.6 qtls. of rice for getting one acre of their land irrigated.

f. It has also been observed that all the STWs in the three FMCs were installed by contractors engaged by the Department of Agriculture although it was the responsibility of the FMCs. It is also interesting to note that the contractors even identified some of the beneficiaries of the programme. Therefore, the assigned role of the FMCs to plan and implement the programme has been marginalized by vested interests.

g. The share-croppers or the tenants till now have no access to the irrigation facilities created under this programme mainly due to the prevailing practices, in which, half of the produce goes to the actual owner of the land who does not share the cost of the required inputs. The cost of inputs excluding labour is about Rs 5200/ (estimated by the author), and a share-cropper obviously cannot bear it alone.

67. The above observations give a fair idea of the nature of implementation of the STW programme in Assam. As per the estimates made by the government of Assam, the total requirement of foodgrains, that is, rice, wheat and pulses was 4893 thousand tonnes in 1999-2000, and it was expected that this target could be achieved through the

STW Programme. Nevertheless the total production of these crops was 4028 thousand tonnes in the year, and hence, the gap between production and requirement of food crops persisted till 1999-2000. Perhaps, the marginal gap could have been filled through the STW programme if it would have been backed by appropriate institutional arrangement.

7.6.3 Institutional Reforms for a Better Future

68. Assam can produce enough agricultural surplus through appropriate technological intervention designed for increasing cropping intensity from its present level of about 146 per cent to at least 200 per cent, and evolving a cropping pattern consistent with its agro-climatic factors. A large part of the state gets severely affected by floods every year, nevertheless, as the technical experts have shown, at least 200 per cent of cropping intensity can be achieved even in the flood prone areas (Compendium on Installation of one lakh STWs Under NABARD Assistance Programme during 1999-2000, Department of agriculture, Govt. of Assam). This, however, requires assured irrigation. It is evident from Table 7.18 that Assam is enormously rich in ground water resource on the basis of which, another 47 per cent of the net sown area of the state can be brought under assured irrigation. The experience of the present STW programme, however, suggests that the technical intervention should have been supported by the required institutional reforms for achieving a qualitative breakthrough. The major institutional reforms required for Assam are summarized below.

a. Conceptually, the FMC is an instrument that can assure participation of the people at the grass roots in the process of planning and management of agricultural products besides representing a collective ethos for achieving a definite goal. At the empirical level, as it has been noted through the case studies cited earlier, the FMCs have become merely an official requirement for benefit of the relatively better-off farmers. Therefore, it is imperative to restructure the FMCs to assure effective participation of people at the grass roots and to make it accountable to the people at large instead of any government department. The most effective mechanism will be to bring the FMCs under the purview of the Panchayati Raj which is likely to be revitalized soon in the state. Such a step will not be contrary to the provisions of the Assam Panchayat Act, 1994 that was enacted by and large in conformity with the 73rd Amendment of the Constitution.

b. Arranging the required technical training for the FMCs was a primary responsibility of the Department of Agriculture. The performance of the department, in this respect has, however, been extremely poor. Therefore, the department must be geared up to arrange adequate training for the farmers. Besides that, the administrative machinery of the department should also take appropriate steps to ensure support services to the farmers at the time of need.

c. As a part of an effective mechanism of marketing the products, it is imperative to bring the FMCs under a scientifically designed market information system.

d. Tenancy reform is another important step required for agricultural development in Assam. Despite the legal measures taken in the state since Independence against exploitative tenancy, as reported by NSSO in its 48th Round, the proportion of tenanted land in total operated area in Assam had increased from 6.4 per cent in 1981-82 to 8.9 per cent in 1991-92. The rate of growth is high, and probably, it continues to grow at the same rate, if not more. With the present practices of tenancy where the costs are not shared proportionately, as indicated earlier, at least 10 per cent of the operational area of the state will continue have low productivity. Therefore, the existing tenancy reform programmes should be implemented in the state more vigorously. So far, the issue has eluded any action.

7.7 Pisciculture in Assam: Status and Prospects

7.7.1 Background

69. Fish is an important constituent of diet of about 95 per cent of Assam's population. It is a high protein and easily digestible food, and therefore, important for nutrition. No study has been made to estimate the demand for fish in the state and external supply of fish to the state. Department of Fisheries has a scheme to collect information in this regard. Data on these aspects are essential for planning purposes. The survey work under this scheme is totally stagnant due to paucity of fund. However, 11 kilogram is considered as per capita annual requirement of fish. Assam's fish production can meet only about fifty per cent of the nutritional requirement of 280 thousand tonnes, whereas internal production stands at around 160 thousand tonnes (Department of Fisheries, 1997-98). The deficiency is met by importing fish by private traders from other states, mostly from Andhra Pradesh. According to the Department of Fisheries, the state imports around 20,000 tonnes of fish annually.

70. The estimated value of this annual import is about Rs 80 crore (A recent estimate shows that about Rs 200 crore is spent annually to import fish to the state from outside. However it has not mentioned the quantum of fish imported). What is imported is mostly common fish and if Assam can produce more in a competitive price import would cease. It is sad that a state with 1.5 lakh hectares of inland water bodies and 5500-km long river stretches should import fresh water fish from other states. Assam has not been able to utilize its full potential of fish production, despite the initiation in 1995-96 of an eight year programme for improvement of pisciculture in the state under the World Bank aided Assam Rural Infrastructure and Agriculture Services Programme (ARIASP). Though deficient in fish production, aquaculture plays an important role in the state's economy providing livelihood to thousands of people directly or indirectly. The gross value of fish production in the state in 2000-01 is estimated to be around Rs 640.00 crore (Department of Fisheries, 2001).

7.7.2 Water Resources in the State

71. The state is endowed with rich capture (defined as fishing in open waters like rivers with natural fish stock) and culture fisheries of varied types. The Brahmaputra and the Barak along with their tributaries and numerous floodplain lakes (beel) and ponds constitute traditional sources of fishing in the state. Category wise fishery resources are as follows -

a. River Fisheries – 5,500 km of river length
b. Beel/ Ox-bow lakes – 100,000 ha
c. Forest Fisheries- 5017 ha
d. Derelict water bodies/swamps, 10,000 ha
e. Reservoir Fisheries- 1713 ha
f. Ponds/Tanks- 25,423 ha

Source: Department of Fisheries, Government of Assam, 1997-98

72. The district-wise distribution of water resources (fisheries) is shown in Table 7.21. The table does not cover riverine sources.

Table 7.21: District-wise Water Resources (Fisheries) in Assam 1997-98

Sl.No.	District	Ponds/ Tanks (hectare)	Beel/ Swamp, Low lying area (hectare)	Total (hectare)
1	Dhubri	726.36	7287.42	8007.78
2	Kokrajhar	451.93	913.50	1365.43
3	Bongaigaon	330.35	1758.09	2088.44
4	Goalpara	754.49	10487.29	11241.78
5	Barpeta	1659.71	6764.80	8424.51
6	Nalbari	2245.19	2863.83	5109.02
7	Kamrup	1500.00	1607.16	3107.16
8	Darrang	2008.00	6092.37	8700.37
9	Sonitpur	1226.69	7390.45	8617.14
10	Lakimpur	621.03	5255.97	5875.00
11	Dhemaji	270.00	7015.98	7285.98
12	Marigaon	587.14	2955.96	3543.10
13	Nagaon	3910.00	16532.40	20442.40
14	Golaghat	795.33	2819.21	3114.54
15	Jorhat	289.30	6778.98	7068.28
16	Sibasagar	956.27	5068.31	6024.58
17	Dibrugarh	125.73	4755.85	4881.58
18	Tinsukia	182.82	3907.27	4090.09
19	Karbi Anglong	503.07	97.18	600.25
20	N.C. Hills	51.45	1725.87	1777.32
21	Karimganj	2267.26	4310.44	6577.70
22	Hailakandi	1261.69	2103.05	3364.74
23	Cachar	3200.00	4812.58	8012.58
	Total	25423.81	113295.96	138719.77

Source: Department of Fisheries, Government of Assam

73. The river Brahmaputra harbours some of the finest fish species of the world such as the Indian major carps (*labeo rohita, labeo calbasu, catla catla* and *cirrhinus mrigala*). Other economically important species are catfish (*wallago attu, silondia silondia, pangasius pangasius, aorichthys seenghala, aorichthys aor, bagarious bagarious*, and *ompok bimaculatus*). "Although there is no official fish catch statistics of the rivers in Assam, observation made by the Central Inland Fisheries Research Institute has indicated a declining trend due to habitat loss" (Assam Prakalpa 2000).

7.7.3 The Trend in Fish Production

74. There is no reliable data on the fish production in Assam. The State Fisheries Department does not have any machinery to collect fish catch statistics from rivers, *beels* and ponds. Apart from this there seems to be some bias in estimates of production. In the year 1991-92 fish production suddenly jumped to 134 thousand tonnes from 76 thousand tonnes in the previous year registering a growth of 76 per cent. "Considering the area under aquaculture and the level of technology such a drastic increase in one year cannot be expected. Moreover, such unprecedented increase in catch would have been accompanied by a glut in the market. No such drop in price was noticed. Moreover, such large increase in production was not noticed in subsequent years" (Assam Prakalpa, 2000). Apart from this so far the state has able to meet the modest target with growth rates that were modest even during the implementation of the ARIASP (Table 7.22). The annual growth rate is just 0.6 per cent during the period 1995-96 to 1999- 2000. The poor increase in production is stated primarily due to lack of extension support to farmers and poor coverage of water area for development of government sponsored schemes. The state has production potential of 400 thousand tonnes fish annually, whereas achievement is about 160 thousand tonnes (Department of Fisheries, 2000-01).

75. As reported by the Department of Fisheries, Assam has attained self-sufficiency in carp seed production in the stage of *fry*. This is primarily due to commissioning of 61 eco-hatcheries in the state. It may be noted that most of the eco-hatcheries of the state are in private sector. Infrastructures available for seed production in the districts of the state are shown in Table 7.23. The trend in production of fish and fingerlings in the districts of the state can be inferred from Tables 7.24 and 7.25.

76. The scenario of production of seed of live-fishes is not at all encouraging at present (See Table 7.22). To meet the growing demand of live fishes, mainly of *magur* (clarias batrachus), four breeding centre were established in the state during 1997-98 under World Bank assisted ARIASP for research purpose. There is also a move to introduce prawn culture with seed to be brought from West Bengal. The World Bank is funding the farmers' ponds and community tanks programme and the beel and open water fisheries programme under the ARIASP.

77. The beels, which are organically productive ecosystems with a conducive environment for fish growth, are the prime inland fisheries of the state. However, most of the beels are in derelict stage. The state has achieved fish production at a level of about 158.62

thousand tonnes during 2000-01. This included fish of all varieties from all types of water sources.

Table 7.22: The Trend in Production of Fish and Fish Seed

Year	Fish Seed (in million numbers)		Fish (in thousand ton)	
	Target	Achievement	Target	Achievement
1990-91	140.00	1188.60	75.00	76.02
1991-92	135.00	1215.14	85.00	134.07
1992-93	1500.00	1626.32	140.00	140.60
1993-94	2000.00	2170.81	142.00	151.60
1994-95	2000.00	2386.79	145.00	153.00
1995-96	2400.00	2547.54	148.00	155.00
1996-97	2500.00	2634.38	153.00	154.60
1997-98	2600.00	2245.57	157.00	155.10
1998-99	2600.00	1703.06	157.00	155.70
1999-00	2600.00	2114.14	157.00	159.77
2000-01	2600.00	1485.65	160.00	158.62
2001-02	3000.00	N.A.	175.00	N.A.

Source: Department of Fisheries, Government of Assam

Table 7.23: Infrastructure for Fish Seed Production in the Districts of Assam

Sl.No.	District	Eco hatchery	Hapa breeding centre	Mini embankment with portable hatchery
1	Dhubri	-	4	1
2	Kokrajhar	-	-	-
3	Bongaigaon	1	-	-
4	Goalpara	-	6	-
5	Barpeta	6	16	1
6	Nalbari	3	11	-
7	Kamrup	1	2	1
8	Darrang	-	-	1
9	Sonitpur	2	13	1
10	Lakimpur	3	10	1
11	Dhemaji	-	11	-
12	Marigaon	2	-	-
13	Nagaon	33	-	-
14	Golaghat	1	3	-
15	Jorhat	-	3	-
16	Sibasagar	3	-	1
17	Dibrugarh	1	1	1
18	Tinsukia	1	5	-
19	Karbi Anglong	1	2	-
20	N.C. Hills	-	-	-
21	Karimganj	2	32	-
22	Hailakandi	1	14	-
23	Cachar	-	15	-
	Total	61	251	1

Source: Department of Fisheries, Government of Assam

Table 7.24: District-wise trend in Fish Production in Assam (in tonnes)

Sl.No	District	1993-94	1994-95	1995-96	1996-97	1997-98
1	Dhubri	11012	11402	11605	9978	10088
2	Kokrajhar	5997	5592	4576	4049	4150
3	Bongaigaon	5434	4412	3900	5050	5243
4	Goalpara	5547	5801	5776	5812	5873
5	Barpeta	9173	9286	9528	9760	9956
6	Nalbari	12902	9762	8501	8650	8766
7	Kamrup	9501	9642	7983	9960	9985
8	Darrang	6365	6585	8037	6727	6089
9	Sonitpur	5187	5451	6225	5809	5802
10	Lakimpur	6533	4855	6114	6098	5732
11	Dhemaji	2807	4193	3486	3673	3857
12	Marigaon	6760	6804	6874	6846	6892
13	Nagaon	12576	12630	12837	12935	13065
14	Golaghat	2469	3289	4726	4172	4178
15	Jorhat	6401	6627	6653	6427	6488
16	Sibasagar	5253	5222	5318	5455	5570
17	Dibrugarh	6939	7292	8177	7832	7870
18	Tinsukia	8146	8302	5379	7321	7775
19	Karbi Anglong	3028	3392	3110	2808	2245
20	N.C. Hills	521	714	1120	720	755
21	Karimganj	7447	7380	10076	9457	9470
22	Hailakandi	2296	5180	5455	5303	5485
23	Cachar	9347	9207	9601	9765	9790
	Total	151641	153020	155057	154607	155124

Source: Department of Fisheries, Government of Assam

7.7.4 The Trend in Productivity

78. The productivity of carp-fish in culture ponds has reached 1680 kg/ha yearly. Annual productivity has reached 300 kilograms per hectare in the beel areas covering 4572 hectare, which was developed under the World Food Programme during 1987-88 to 1996-97. Natural productivity of some beel fisheries has gone down due to discontinuation of auto-stocking facilities because of silting of link channels with the river, resulting primarily from construction of flood control embankments. These environmental factors have been taken into consideration in the development of ARIASP. Riverine fish production is in the range of 50 kg per hectare. Indiscriminate catching of brood fish and juveniles using prohibited nets has reduced the river productivity. Attempts are being made to achieve Maximum Sustainable Yield (MSY) in such natural bodies.

Table 7.25: District-wise trend in Fry and Fingerling Production in Assam (million number)

Sl.No	District	1993-94	1994-95	1995-96	1996-97	1997-98
1	Dhubri	6.71	15.85	30.43	17.36	4.68
2	Kokrajhar	.08	3.99	3.43	2.51	NA
3	Bongaigaon	7.20	10.66	11.72	11.66	15.51
4	Goalpara	.31	1.50	2.80	2.20	2.90
5	Barpeta	161.30	176.14	317.12	404.31	198.67
6	Nalbari	111.51	111.84	151.00	269.52	153.09
7	Kamrup	1.47	3.70	5.15	1.22	.29
8	Darrang	17.46	27.44	7.80	14.13	6.93
9	Sonitpur	12.02	13.90	18.97	8.70	20.23
10	Lakimpur	19.61	31.69	50.17	65.86	70.47
11	Dhemaji	1.24	5.98	3.78	1.95	.97
12	Marigaon	12.78	14.55	30.67	5.62	6.08
13	Nagaon	1037.19	1810.67	1258.00	1300.97	1452.85
14	Golaghat	3.16	7.83	11.93	8.31	8.20
15	Jorhat	1.69	.46	4.22	1.21	16.20
16	Sibasagar	7.49	7.88	15.20	16.72	18.35
17	Dibrugarh	2.67	5.65	11.22	15.32	17.71
18	Tinsukia	4.23	4.88	8.61	9.55	8.54
19	Karbi Anglong	.53	.84	1.20	1.85	1.77
20	N.C. Hills	.09	NA	.90	.05	.09
21	Karimganj	713.44	85.65	536.15	410.76	163.25
22	Hailakandi	26.31	28.40	34.14	36.24	67.67
23	Cachar	22.32	17.29	33.68	28.25	11.12
	Total	2170.81	2386.79	2548.29	2634.27	2245.57

Source: Department of Fisheries, Government of Assam

79. "There are two approaches in increasing fish production from beels. One is the creation of battery of (one-hectare unit each) enclosures along the margin of a beel These aquaculture estates can be leased out to entrepreneurs for growing fish in captivity. Here productivity can be achieved at par with the culture fisheries. The other approach is to stock the main beel with fingerlings of economically viable species" (Assam Prakalpa 2000). The Department of Fishery reported that productivity in the beel fisheries could be achieved up to 800 kilogram per hectare by practising intensive culture-based fisheries.

80. Pig-cum-fish culture can be a highly profitable venture. Waste from pigpens is rich in nitrogen and act as excellent pond fertilizers and fish feed. By combining piggery and aquaculture, the input cost of aquaculture can be brought down substantially. It is estimated that seven tonnes of fish and 4500 kilogram of pig meat can be produced from a one-hectare farm. Similarly, poultry and duck farming can be linked with aquaculture. It is estimated that from one-hectare poultry-cum-fish culture farm, five tonnes of fish, 1250 kilogram of chicken meat and 70,000 eggs can be produced. A one-hectare duck- cum-fish farm can provide four tonnes of fish, 750 kilogram of duck meat and 6000 eggs. Such integrated system of aquaculture can raise the productivity of fish in the state (Assam Prakalpa 2000).

7.7.5 Constraints of Increase in Productivity

81. The reasons for low fish productivity in the culture fisheries of the state are attributed to: non-availability of uniform standard quality seed in the right season, scarcity of balanced fish feed and inadequacy of technology transfer. It is complained that though there is provision under the World Bank aided ARIASP, adequate quantity of fish feed does not reach to fish farmers. Recently, Government of Assam has ordered a probe into a scam of Rs 100 lakh related to procurement and distribution of fish feed. The problem is further aggravated by the low temperature regime and acidic soil, where breeding and rearing are difficult. It requires 600 kilograms of lime per hectare fisheries for treatment of the acidic soil. One kilogram of lime costs Rs 6 and it leads to high cost of production. Fisheries in Assam have to incur this additional cost in pisciculture. The Department of Fisheries reported that the variable cost to produce one kilogram of fish in culture fisheries is Rs 20.

82. The general constraints for low fish productivity due to under utilization of aquatic resources in low lying areas, insufficient rearing tank area in seed production farms for raising fingerling from the fry stage in comparison to volume of fry produced in the state, mortality of fish in both culture and capture fisheries due to Epizootic Ulcerative Syndrome (EUS), causing heavy financial loss to fish farmers. The disease is more prevalent in culture fisheries particularly during the winter months. Moreover several waves of flood during the monsoon season lead to financial loss to the farmers.

83. It requires substantial investment to develop culture fisheries. According to the Department of Fisheries it costs Rs 60,000 to develop one hectare of beel fisheries. If one wants to double the production in the existing beel fisheries an additional amount of Rs 15,000 has to be invested per hectare. Intensive pisciculture means there are requirements of more fish feeds and more efficient management.

7.7.6 Assam Rural Infrastructure and Agriculture Services Program (ARIASP) in the State

84. The Department of Fisheries, Assam has secured a World Bank Assistance project with a fund provision of Rs 28.37 crore for a period of eight years from 1995-96. The components of this project are –

    a. Fish seed production – establishment of an eco-hatchery at Assam Agriculture University to produce genetically improved quality fish seed

    b. Mobile Fish Health Clinic to provide fish health cares to farmers.

    c. Targets for the ARIASP for financial assistance are set as follows: for fish production in farmers/community tanks to achieve production up to 3000 kilogram per hectare per annum in 800 farmers' ponds covering 200 hectare, 150 community tanks covering 300 hectare, 125 pig cum fish farms covering 31.25 hectare and 500 fish cum horticulture project covering 125 hectare. It is also targeted to develop 50 beels covering 5000 hectare and 10 open water areas covering 500 hectare to increase the productivity from the present level of 100 kilogram to 500 kilogram per hectare.

d. ARIASP also proposes to strengthen the existing facilities for research at Assam Agriculture University, Jorhat and College of Fisheries, Raha. A College of Fisheries was established at Raha in Nagaon district in 1987-88 with financial assistance from ICAR and Government of Assam. This College has an intake capacity of 20 students and affiliated to Assam Agriculture University. A research project is being organised jointly with the Assam Agriculture University for the development of two of the locally important species – *Punctius sarana* (seni puthi) and *Notopterus* (chital). Species like *Clarias batrachus* (magur), *Heteropnestes fossilis* (singhi) and *Puntius sophore* (puthi), once found in large number all over the country, are now freely available only in Assam. Six research projects approved for funding under the ARIASP are in various stages of operation at AAU, Jorhat and College of Fisheries, Raha.

Table 7.26: Target and achievement under ARIASP project since its inception

Sl. No.	Item	Unit	1995-96		1996-97		1997-98	
			Target	Achiev-ement	Target	Achieve-ment	Target	Achieve ment
1	Eco-hatchery	Number	1	-	1	-	1	-
2	Farmers pond dev.	Hectare	25	-	25	55.63	57	57.65
3	Community tank dev.	Hectare	20	-	40	90.53	40	92.02
4	Dev. Of beel fishery	Hectare	625	-	625	-	625	783
5	Mini fish feed plant	Number	1	-	1	-	1	1
6	Magur breeding centre	Number	2	-	3	-	5	4
7	Training centre (new	Number	3	-	3	1	5	5
8	Strengthening of existing training centres	Number	2	-	2	2	-	-
9	Training of staff	Number	40	-	40	34	40	38
10	Demonstration projects	Number	50	-	50	44	50	84
11	Wet laboratory	Number	2	-	2	-	2	1
12	Training of fish farmers	Number	200	-	200	200	200	200
13	Research projects	Number	2	-	2	-	2	5
14	Demonstration projects	Number	25	25	25	25	25	25

Source: Department of Fisheries, Government of Assam

85. The trend in first three years show that after some initial hiccups ARIASP has got the momentum and has able to hit its targets set (See Table 7.26).

7.7.7 Development Programme of Department of Fisheries, Government of Assam

86. The development programmes of the state department as per Ninth Plan allocation were as follows –

a. Aquaculture Development under Fish Farmer's Development Agency (FFDA) – the pattern of funding for this centrally sponsored scheme was 50:50 between the Government of India and Government of Assam till 1999-2000. Now in this scheme, the state's share has been reduced to 25 per cent. There is enough scope to develop existing ponds covering 25,400 hectares and create ponds in low-lying areas covering a potential of about 20,000 hectares. However, the expected level of progress could not be made, as the state government could not release the matching share. This has resulted non-availability of the Central share for these schemes. Till the fourth year of the 9th Plan only 200 hectares of fisheries could be developed against the target of 5750 hectares.

b. Development of derelict water bodies – The state has 10,000 hectares of derelict water bodies with potential for pisciculture. Only 127.5 hectares against the target of 357.25 hectares could be developed till the fourth year of Ninth Plan.

c. Rejuvenation of River Fisheries (Social Fisheries) – Steps have been taken to revitalize the fisheries to achieve maximum sustainable yield by artificial stocking of fingerling and by following strict observation of Fishery Acts and Rules.

d. Prawn farming has been proposed to introduce in the state, as there is high demand for it. Naturally entrepreneurs are showing interest in prawn farming. This scheme has been proposed under the Central scheme.

e. National Welfare Fund for Fisherman – This Centrally sponsored scheme is to construct low-cost houses, tube well and community hall for poor fisherman in selected villages. The expenditure for this scheme was to be shared between the Central and state governments on 50:50 basis. However under this scheme till now only 20 houses could be constructed against the target of 354 houses in the 9th Plan.

f. Development of Beel Fisheries – The state has one lakh hectare of beel and open water fisheries. This constitutes 12 per cent of the country's wetland. During the 8th Plan the Department of Fisheries had developed 4523 hectares under the World Food Programme. During the 9th Plan target was to develop 6000 hectare of wetland under the ARIASP. However it is anticipated that only 4676 hectares would be developed during the Plan. At present beel fisheries of Assam is giving an annual production of 24,205 tonnes only. Assam Fisheries Development Corporation, a sister organization of Department of Fisheries is responsible for development of beel fisheries in the state. The Corporation has been assigned to develop 192 beels. After the

development of the beels, the Corporation leases out the beel areas to fisherman and local cooperative societies. The highest bidder gets the lease, however, there is 7 to 12 per cent relaxation for the people from scheduled communities. Generally beels are leased out for one to three years. At present excessive number of employees in the Corporation has been eating up its resources. This impedes the Corporation's development initiatives.

87. Fish Seed Farming- the state has achieved self-sufficiency in seed production mainly through involvement of private sector. However the quality of the seed is not up to standard due to the fact that these seeds are in bred and also under sized.

88. Extension and Training – The Central Sector Scheme of fisheries extension and training could not be introduced so far due to poor financial health of the state. The state has not able to provide 20 per cent of its share under this scheme.

89. A major decision has been taken by the Government in 1994 to hand over all low lying areas in the state in the range of 3 hectares and above which are unsuitable for agriculture from Revenue Department to Department of Fisheries. These lands are proposed to be leased out to FFDA trained interested entrepreneurs subsequently for development of aquaculture.

Table 7.27: Target for Ninth Five-Year Plan of Department of Fishery

	Schemes	Unit	Target for 9th Plan
1	Seed Production	Million	3000
2	Fish Production	000' tones	175
3	FFDA	No. of beneficiary	5750
4	Reclamation of derelict water bodies	Hectare	785.80
5	Training of farmers	Number	4200
6	National welfare fund for fisherman	Number of houses	384
7	ARIASP		
a	Eco hatchery	Number	1
b	Ambulance van	Number	6
c	Farmers pond development	Hectare	144.37
d	Community tank	Hectare	209.47
e	Development of beel fisheries	Hectare	5000
f	Mini fish feed plant	Number	1
g	Magur breeding unit	Number	4
h	Establishment of Fishery training centre	Number	6
i	Training of extension staff	Number	120
j	Fish cum horticulture centre	Number	500
K	Wet laboratory	Number	2
l	Training of farmers	Number	1000
m	Research programme	Number	5
n	Pig cum fish centre	Number	125

Source: Department of Fisheries, Government of Assam

Table 7.28: Target and Achievement of Department of Fishery for the year 1997-98

	Schemes	Unit	Target	Achievement
1	Seed Production	Million	2598	2245.57
2	Fish Production	000' tonnes	157	155
3	FFDA	No. of beneficiary	1150	575
4	Reclamation of derelict water bodies	Hectare	162.28	112.28
5	Training of farmers	Number	1850	1325
6	National welfare fund for fisherman	Number of houses	56	28

Source: Department of Fisheries, Government of Assam

90. The Department of Fisheries of the State has set a modest target for the 9th Plan. The Department has collaborated with ARIASP and has given more emphasis on FFDA and training of farmers. Emphasis of ARIASP is seen more on infrastructure development such as establishment of eco-hatcheries, breeding plant, wet laboratory, farmers and community pond development and also on training of farmers (Table 7.27).

91. A glance at the target and achievement of the Department of Fisheries for the year 1997-98 will show that the department has not been able to reach its target in a single scheme (See Table 7.28).

7.7.8 Problems and Development Strategies

92. The state is in a better position to attain self-sufficiency in fish production. The perennial problem of floods, under utilization of aquatic resources and low lying areas, use of unscientific methods in fishing and indiscriminate poaching of brood fish are some of the main reasons for the low fish production in the state.

93. Technology, development of water resources, local entrepreneurial efforts and adequate provision of fund are required for the development of aquaculture in the state. According to the Department of Fisheries, the state can reach its production level up to 400 thousand tonnes annually. The fisheries officials tell that this is the ultimate potentially of the state if all financial and technological provisions are made available and there is effort from the local entrepreneurs. Thus, the Department of Fisheries aims for maximum additional 40,000 tonnes over the next few years to the existing production level of 160 thousand tonnes. According the fisheries officials utilization of the fullest potential would lead to glut in the market. The estimated demand at the current market price is about 180 thousand tonnes. With a population growth of 10 per cent over the next five years, the fish demand would grow by 18 thousand tonnes. In fact, it will grow more because of increase in per capita income. To this one should add 20 thousand tones to replace present imports. Thus, 40 thousand tones of fish could easily be absorbed in Assam. This implies a fisheries production growth rate of 5 per cent per annum. A per a survey report prepared by Barrackpore Central Fishery Research Institute, Assam has the potential to produce surplus fish if its potential is tapped properly. This, however, requires development of storage and transport infrastructure to export fish to other states. Given Assam's transport disadvantage, and

the high cost of fisheries due to the problem of acidic soils, exports at this stage do not seem promising.

94. Some short-term strategies include modern aquaculture practices in private sector to optimize production level, introduction of integrated farming, revitalization of extension machinery, training of farmers and financial support to farmers for development of their pond. The long-term measures include development of water bodies, rational exploitation of the fisheries in low-lying areas and regeneration of unsuitable agricultural land to piscicultural activities. Rearing of fingerlings is an essential prerequisite for obtaining optimum fish production. Stocking of fingerlings of the right size is the most important prerequisite for the success of beel fisheries. Though the state department has claimed to have reached self-sufficiency in production of fingerling, the problem of limited supply of quality fingerlings still persists (Department of Fisheries, 1997-98).

95. It is important to ensure that fisheries are exploited rationally. Generally the Assam Fisheries Development Corporation leases out the beel fisheries for a duration of one to three years. This leads to overexploitation of fisheries. It may be noted that there is no provision to control overfishing. If provision is made to lease out the beel fisheries for longer duration (seven years as suggested by fisheries officials) then there is incentive for the lessees to develop the beel fisheries. It requires about Rs 15,000 to develop one hectare of beel fisheries and the investors cannot get the return of this investment in one year.

96. There is need to strengthen the cooperative movement in Assam to usher in a revolution in fish farming. The Assam Apex Cooperative Fish Marketing and Processing Federation Limited (Fishfed) was established in 1978 to work towards enhancing fish production in the state by encouraging activities of fisheries in cooperatives and also through its own production. However, Fishfed itself is now struggling for its survival. Lack of support from the government, non- professional management and a handful of ineffectual projects have dragged fishfed to a deplorable status. Since its inception, it has accumulated financial loss of Rs 120 lakh. Annual running cost of this federation is Rs 20 lakh per annum of which Rs 15 lakh goes towards payment of its staff salaries. However, it could sell fish worth only Rs 13 lakh annually. The opportunity to effectively utilize the Rs 250 lakh loan from National Cooperative Development Cooperation (NCDC) in 1994-95 to set up cold storage facilities in the state could not be availed by Fishfed for want of a suitable plot of land.

97. Asia's biggest dry fish market is located at Jagirod, Assam. It is a Rs 40000 lakh annual business and on average 400 truck load of dry fish is sold in this market every year. However, it is on the verge of closure with the sales dropping alarmingly following imposition of eight per cent sales tax by the state government in 1999. That year it resulted 75 per cent drop in sales. The government needs to look into the implications of its policy.

98. A sum of Rs 9425 lakh was allotted during the Ninth Plan for development of fisheries in Assam. Moreover, provision of Rs 2837 lakh has been made under the ARIASP for

a period of eight years. There were nine schemes under implementation under the Department of Fisheries, however, all of them had a very high salary component leaving a negligible amount for development purpose.

99. Assam's fish production need not be restricted to meeting only demand in the North-East. If Andhra Pradesh can export fish to Assam, so can Assam export to Andhra Pradesh. The possibility of ushering in a blue revolution in Assam was outlined by an eminent fisheries scientist and Chief General Manager of NABARD. (See Box 7).

7.8 Forestry in Assam

7.8.1 Background

100. The state of Assam is well known for its extensive forest area with varieties of flora and fauna. The total area under forest is 23688 square km (1999 estimate of the State forest Department). This constitutes 30.20 per cent of total geographical area of the state. The total area under reserved forest was reported to be 17420 square km in 1999 (20.21 per cent of the total geographical area of the state). The State Forest Department manages the forest in the plain districts of the state. In the two hill districts (Karbi Anglong and North Cachar Hills) the management of forest is a responsibility of their respective districts councils.

101. The forest products of Assam comprise mainly industrial wood, fuel wood, bamboo, stone, thatch, cane, sand, etc. Among these industrial wood and fuel wood are the two main forest products. Outturn of industrial wood was 49.55 thousand cubic meters and of fuel wood was 33.84-thousand stack cubic meter during 1995-96 (Economic Survey, Assam 2000-2001).

102. The forest provides economic support to about 15 lakh people particularly in rural areas of Assam. The state government earns a good amount of revenue from various forest products. There is a sharp decline of revenue earned from timber during the year 1997-98 (Table 7.29). It is because of the ban imposed by the Supreme Court on felling and movement of timber from 1996 onwards. However, it has again shown an increasing trend from year 1999- 2000 onwards. The expenditure of the forest department has shown an increasing trend till the year 1999-2000 for both plan and non-plan expenditure. But for the year 2000-2001 the expenditure of the forest department in both heads has decreased (See Table 7.30).

Box 7:
BLUE REVOLUTION FOR INCREASING FISH PRODUCTION IN ASSAM – STRATEGIES

The capture fishery from Brahmaputra river, Barak river and Beel fisheries contribute about 80.6% but is fast declining due to over exploitation and indiscriminate fishing. Efforts will have to be made to increase the capture fishery production through measures like conservation, protection of breeding grounds, ranching with quality seed and selective fishing. The best course to increase capture production is to ban fishing in monsoon when most of the commercially important fishes breed as well as go for ranching the natural areas by releasing surplus seed of seed farms. It should be the endeavor of the state to increase per unit area production to at least 500 kg fish per kilometer length of rivers and 1000kg/ha from beel fisheries. This could substantially contribute to increase in the fish production of the state. The World Bank funded ARIASP is aimed at developing the beels of Assam.

The reservoir fishery in Assam did not get adequate attention despite having a potential of over 1700 ha water area spread across two reservoirs. Both the reservoirs are quite productive and unpolluted. Based on the experiences of other states it can safely be assumed that these reservoirs could easily produce about 100kg per ha. giving a total production of over 170 tonnes per annum. Integrated development of reservoirs would not only increase fish production of the state but could also generate ancillary activities providing job opportunities to rural youths.

Ponds and tanks cover an area of 25423 ha in the state out of which only 62% is being used for aquaculture contributing a mere 19.4% of the total fish production. Because of traditional cultural practices the average production per hectare is merely 1680 kg/ha/yr as against 3000 to 5000 kg/ha/yr in several other states. It should, therefore, be possible to increase the productivity of these confined water bodies to a level of 2800 kg/ha/yr.

Composite fish culture for Indian major carps (catla, rohu, mrigal, and kalbasu) and exotic fishes (silver carp, grass carp and common carp) could be taken up through eco friendly semi - intensive method. It is easily possible to produce two and half to three tonnes per hectare on a sustainable basis under climatic conditions prevailing in Assam.

The state can plan to bring in about 30000 ha. water area under composite culture in next three years by renovation of existing ponds and by construction of new ponds. These areas can be stocked at the rate of 5000 fingerlings/ha in different proportions depending upon the seed availability. Assuming 70% survival rate, minimum management and a modest average weight of 800gm, this could yield about 84,000 tonnes of fish in 9-12 month culture period.

For this each District Fishery Officer and Chief Executive Officer of FFDA may be provided yearly physical targets. Development would include excavation of ponds upto 1.5m depth and raising of bundhs and compaction to a level so as to prevent inundation and flooding. Implementation of the programme coupled with extension has to be taken up at sub-division/ block levels by the Fishery Extension Officers and Demonstrators and, to be monitored by the Director of Fisheries as well as by the Deputy Commissioners. The unit costs for renovation of existing ponds and excavation of new ponds are estimated in year 2000 to be Rs 1.157 lakh and 1.683 lakh per hectare respectively and total project cost to be about Rs 8674.95 lakh and Rs 37876.45 lakh. Appropriate development of fish seed hatcheries, nurseries, and reaming areas has to be done to attain this target.

In three years the state would be producing additional about 420 millions of spawn, 140 millions of fry, 35 millions fingerlings and about 84,000 tonnes of table fish per annum. The state could then be in position to bridge the gap of supply and demand by about 75%, earn revenue of Rs 430.24 crore, restrict outflow of funds, generate employment and improve rural economy. The project has the potential to generate gainful employment for about 3.12 lakh skilled and unskilled people directly and another 15.12 lakh people indirectly over a three-year period, which will go a long way in improving the socio economic situation of nearly 10% of the population of the state in the rural areas. It is estimated that with an investment of Rs.492.25 crore at the ground level an income of Rs 430.24 crore per annum ca be generated with these efforts. Though the state has missed out on the "blue revolution" that has taken place in some of the other states it is time to catch up with development, better late than never.

Date: August 29, 2002

Dr. S. C. Pathak
Chief General Manager
(Nov 1998- Dec. 2000)
NABARD, Guwahati, Assam

103. Apart from the ban faulty government policy has also contributed to the decline in the revenue earning from the forest products. The government had passed an order on December 20, 1993, according to which contractors engaged by various government departments are required to pay only 25 per cent of royalty in advance for forest products. The balance 75 per cent royalty are to be adjusted by the departments concerned at the time of running or final bill payments. The Bureau of Investigation (Economic Offence) conducted a random check in the year 2000 at three forest divisions to assess the quantum of the outstanding amount as royalty. It was found that Rs 60 lakh was outstanding royalty in the three surveyed divisions. If similar royalty dues are outstanding in 36 forest divisions of the state, the total would be, Rs 7.2 crore over an annual revenue of the forest department of around 11.4 crore (The Telegraph, January 25, 2000).

Table 7.29: Revenue Earned by the Forest Department in Assam. (Rs crore)

Year	Timber	Others	Total
1991-92	10.86	6.67	17.53
1992-93	11.44	7.68	19.12
1993-94	14.53	8.07	22.60
1994-95	10.70	6.23	16.93
1995-96	11.03	6.73	17.76
1996-97	9.16	6.12	15.28
1997-98	0.50	7.22	7.72
1998-99	0.50	9.01.	9.51
1999-2000	1.98	9.30	11.28
2000-01	2.86	8.51	11.37

Source: Principal Chief Conservator of Forest, Assam

Table 7.30: Expenditure of the Forest Department (Rs crore)

Year	Non-Plan	Plan	Total
1991-92	25.94	26.78	52.72
1992-93	29.27	21.02	50.29
1993-94	27.86	29.95	57.81
1994-95	28.51	25.18	53.69
1995-96	32.22	22.46	54.68
1996-97	36.24	27.93	64.17
1997-98	43.38	22.00	65.38
1998-99	51.74	24.26	76.00
1999-2000	74.77	31.75	106.52
2000-01	54.71	26.51	81.22

Source: Principal Chief Conservator of Forest, Assam

7.8.2 The State of Forest in the State

104. The forest department has very stringent rules and regulations for harvesting forest produce. The Assam Forest Regulation of 1891, which has undergone changes during

1892-1998, includes many clauses for general protection of forest and forest produce. Further the Assam Forest Protection Force Act, 1986 was enacted for better protection and security of the forest produce. Still it is very sad to note that 15 per cent of the total reserved forest of 17.42 lakh hectare has already been cleared and grabbed by encroachers. In the reserved forest there is large scale over-felling of trees that have reduced the density of the forests.

105. Table 7.31 shows that Assam has lost 820 square km of forest in just six year. If we look at the area under reserved forest (See Table 7.32) we can see that most of the forest divisions experienced a declining trend in their coverage in the late nineties. The table shows that the forest coverage has been has drastically reduced in Dhubri, Doomdooma, Goalpara, Hamren, Kamrup East, Kamrup West, Karbi Anglong East, Kokrajhar Wildlife, Lakhimpur, Mangaldai Wildlife, Nagaon Wildlife, Sonitpur East and in Tinsukia Wildlife Divisions. It also shows that in most of the forest divisions there is a check on the decline of forest area after 1995-96. This may be due to the ban imposed by Supreme Court on felling of trees from 1996 onwards. The area under reserved forest has increased in the District Council, Karbi Anglong West, Karimganj, N C Hills and Nagaon Division.

106. In respect of percentage of forest area Assam was ranked 11th in the country in 1997. But in 1999 the position of the state has gone down to 12th. Shifting cultivation in the hill areas, unrestricted encroachment and illegal felling of trees have contributed to the loss of forest areas in the state.

7.8.3 The Demand for Timber and Firewood

107. Most of the villagers in Assam use firewood as fuel. The scarcity of firewood is a major problem in the villages. The annual consumption of firewood is estimated at 5.2 million tonnes in the state. It is estimated that about half of the total requirements of firewood is drawn from the forest. However, annual availability of firewood in the forest of Assam is about 1.4 million tonnes. Thus, overexploitation has led to decrease in the crown density in the forest of Assam. Apart from this about 1.8 lakh cubic meters are used annually for the construction of houses.

Table 7.31: Forest Area in Assam

	Forest area in square km				
	1993	1995	1997	1999	Loss during the six years in sq. km
Assam	24,508	24,061	23,824	23,688	-820

Source: Principal Chief Conservator of Forest, Assam

Table 7.32: Area under Reserved Forest

		Area in hectare					
		1993-94	1994-95	1995-96	1996-97	1997-98	1998-99
1	Aie Valley	48806.60	49041.60	48953.18	48953.18	48953.18	48953.18
2	Darrang	18020.00	18020.00	18022.21	18022.21	18022.21	18022.21
3	District Council	70333.00	70333.00	70333.00	70333.00	108086.00	108086.00
4	State Zoo	544.00	544.00	130.00	130.00	130.00	130.00
5	Dhubri	32687.00	32687.00	27915.33	27915.33	27951.33	27951.33
6	Dibrugarh	20914.00	20914.00	20912.75	20912.75	20912.75	20912.75
7	Digboi	55521.00	55521.00	55522.90	55522.90	55522.75	55522.75
8	Doom Dooma	29809.00	29809.00	29261.73	29261.73	29261.73	29261.73
9	East Assam Wild Life	49090.00	49090.00	49090.00	49090.00	49090.00	49090.0
10	Tiger Project	51662.00	51662.00	51661.71	51661.71	51661.71	51661.71
11	Forest Utilization Division	NA	NA	NA	NA	NA	NA
12	Goalpara	25779.00	25779.00	24255.33	24255.33	24255.33	24255.33
13	Golaghat	103627.00	103627.00	103627.0	103627.0	103627.00	103627.00
14	Haltugaon	61173.00	61173.00	61173.00	61173.00	61173.65	61173.65
15	Hamren	10538.00	10538.00	10268.00	10268.00	10268.00	10268.00
16	Jorhat	28203.00	28203.00	28194.76	28194.76	28194.76	28194.76
17	Kachugaon	82201.00	82201.00	82240.46	82240.46	82240.45	82240.45
18	Kamrup East	47387.00	47387.00	43930.49	43930.49	43930.49	43930.49
19	Kamrup West	68404.18	68404.18	67076.33	67076.33	67076.33	67076.33
20	Karbi Anglong East	81669.00	111855.00	72720.00	72720.00	72720.00	72720.00
21	Karbi Anglong West	102646.00	102646.00	112734.0	112734.0	112734.00	112734.00
22	Karimganj	76734.00	76734.00	84045.57	84045.57	84045.57	84045.57
23	Kokrajhar Wildlife	NA	21446.00	4566.89	4566.89	4556.69	4556.89
24	Lakhimpur	84277.00	84277.00	73567.42	73567.42	73567.42	73567.42
25	Mangaldai Wildlife	10181.00	10181.00	9831.78	9831.78	9831.78	9831.78
26	N C Hills	61766.00	61766.00	63776.44	63776.44	63776.44	63776.44
27	Nagaon	31821.00	31821.00	33317.50	33317.50	33317.50	33317.50
28	Nagaon South	49227.00	49227.00	50280.50	50280.50	50280.50	50280.50
29	Nagaon Wildlife	10897.00	10897.00	9793.44	9793.44	9857.9	9857.9
30	North Kamrup	44330.00	44330.00	47177.51	47177.51	47177.51	47177.51
31	Sibsagar	25387.00	25387.00	24075.15	24075.15	24075.15	24075.15
32	Silchar	NA	NA	NA	NA	83890.50	83890.79
33	Sonitpur East	60222.00	73929.00	52691.39	52691.39	52691.39	52691.39
34	Sonitpur West	66036.00	66036.00	66065.54	66065.54	66065.59	66065.59
35	Tinsukia Wildlife	65000.00	34000.00	31887.89	31887.89	31887.87	31887.89
36	West Assam Wildlife	20268.00	20268.00	27800.25	27800.25	27800.25	27800.25
37	Hailakandi					63561.07	63561.07
	Total					1742194.96	1742194.96

Source: Principal Chief Conservator of Forest, Assam

108. It is estimated that the wood based industries of the state use (excluding the paper mills) 14.5 lakh cubic meters of wood annually whereas only 6.7 lakh cubic meter can be obtained from the forest optimally (The Sentinel, 8 May 2001*)*. All these have led to depletion of the forest resource of the state. The Forest Policy Resolution of 1988 says provision of sufficient fodder, fuel and pasture, especially in areas adjoining forest, is necessary in order to prevent depletion of forests beyond the sustainable limit. Since fuelwood continues to be the predominant source of energy in rural areas, the programme of afforestation should be intensified with special emphasis on augmenting fuelwood production to meet the requirement of the rural people.

7.8.4 The Supreme Court Ban on Timber Harvest and Transport

109. A public interest litigation was filled in 1995 against the rampant felling of trees in the forest and the Supreme Court came forward with an intervention in December 1996. It

was believed that the order was a right step towards the preservation of ecology of the region. The ban on felling of trees, however, has a negative impact. Hundreds of saw mills and plywood units of the state were closed down since December 1996 (See Table 7.33), throwing the workers out of employment. However, for brief periods of six months each in 1997 and in 2000, the ban was lifted. The Supreme Court issued an interim order asking the mill owners to make regular payment to the permanent employee until the Court's further order. But the mill owners had stopped paying the wages to the permanent employees with effect from December 1998.

110. Afforestation drive in Assam has been hard hit following the Supreme Court order. Apart from the ban on felling of trees, restriction has been imposed on the movement of timber from the North-East to other parts of the country. The ban has affected the nursery owners of the state. It is reported that there has been a sharp decline in the sale of *Simul* and *Kadam* sapling fearing that the planters would not able to reap harvest from their plantation. The argument is that what is the use of plantation when there is a ban on felling trees. People go for such varieties as they fetch Rs 8000 to Rs 10,000 after 10 years of plantation (The Telegraph, March 5,2001). On the other hand in towns like Tinsukia, the saw mills and plywood factories are still running and their godowns are full with sawn timbers. The Supreme Court had issued another order allowing the mill owners to convert the logs to sawn timber lying in the mill premises before the ban was imposed. It is sad to note that most of these logs lying in the open for a long time became unfit for conversion to sawn timbers. So the ban led to wastage of thousands of cubic meters of logs. Further it is alleged that old logs are being replaced and supplemented by fresh ones from forests by the mill owners (The Sentinel, March 24, 2001).

111. In a further move aimed at restricting the movement of illegal timber from the North-East, the Supreme Court ordered all the state governments and the railways to curb illegal movement of timber. The irregularities in movement of forest produce came to the notice of the apex court in the year 2000 when 202 wagons loaded with illegal timbers originating from the North-East was detected by the Ministry of Forest and Environment (The Assam Tribune, May 13, 2001).

112. The apex court held the state governments responsible for movement of timber out of their states. It was ordered that all the states in the region would inform the Special Investigation Team beforehand detailing the total availability of legal timber in their states. This will help to keep an eye on movement of the timber. The railways have also been asked to restrict the availability of wagons for transportation of timber. The Supreme Court also directed the State Forest Departments to use watermarks Transit Pass to avoid forgery in vital documents (The Assam Tribune, May 13, 2001). It is alleged that illegal timbers were being smuggled out of the region using forged Transit Pass. Further the Court has made it clear that the North-Eastern states would not be permitted to fell trees in their forests unless they have sufficient financial back up for regeneration of such areas. Despite all the measures the forest areas of Assam continues to decline. Even after the ban during the period 1997-99 the state has lost 136

square km of its forest area. The lose however, show a declining trend as compared to the loss of 447 square km during 1993-95 and 237 km during 1995-97.

7.8.5 The Effect of the Ban on Industry of the State

113. The Supreme Court ban on timber has affected on the timber-based industries of the state. The number of timber-based factories has gone down drastically from 624 in 1996 to 426 in 1998 (See Table 7.33). Likewise there is decline in paper-based factories in the state. The National Forest Policy, 1988 states that no forest based enterprise, except at the village and cottage level, should be permitted in future unless it has been first cleared after a careful scrutiny with regard to assured availability of raw material.

114. Table 7.34 shows that there is sharp decline in the index of industrial production in case of sawn wood, plywood and matches. The index in the case of sawn wood was 153 in 1993 (at 1970 base) had reached to zero in five years. The same is the case for match industries. The index of plywood production was 454 in 1994 (at 1970 base) that had come down to 164 in 1998.

Table 7.33: Number of Registered Wood based Factories in the State:

	1993	1994	1995	1996	1997	1998
Manufactures of Wood and wood products, furniture and fixtures	606	634	634	624	548	426
Manufactures of Paper and Paper Products, Printing, Publishing and Allied Industries	30	34	34	34	32	30

Source: Directorate of Economics and Statistics, Assam

Table 7.34: Index of Industrial Production in Assam, base 1971=100

	1993	1994	1995	1996	1997	1998
Sawing and planning of Wood	153	115	140	128	3	zero
Manufactures of Plywood	390	454	394	314	178	164
Manufactures of Matches	87	76	80	70	7	zero

Source: Directorate of Economics and Statistics, Assam

115. However, there is optimism in the wood based industrial sector of the state. This is largely due to the compliance by the state government with the mandatory features of the Supreme Court order of January 1998. The order states setting up of industrial estates, framing specific rules for buying and selling timber by the plywood units within industrial estates set up by the state government (The Economic Times, January 20, 2000). However, the promotion of forest-based industry in Assam is not a viable proposition at present. The area covered by the forest is already below the norms set by the National Forest Policy of 1988. The forest cover of the state is dwindling even after the Supreme Court ban. This has affected the environment and ecology of the state.

The National Forest Policy of 1988 also laid down that forest based industry should meet its raw material needs by establishing a direct relationship with tree planters rather than depending on forest, which would henceforth be maintained primarily for ecological functions and for meeting the subsistence needs of the people. However, the amended Forest Conservation Act of 1927, which has been guiding the course of protection and development of forestry in India, has a number of its provisions contradicting the provision of the Forest Policy of 1988. The introduction of regulations to govern the felling of trees in private holdings come in the way of tree plantations by planters which was to provide requirements of the industry as per the Forest Policy of 1988 (Chopra, 1995).

116. There are some major forms of Non-Timber Forest Products (NTFP) in the state like bamboo, cane, thatch, grass, bark, etc. Most of the bamboo forests of the state have been leased out to the paper mills of the state. Moreover many household and non-household industries of the state is based on bamboo and cane products. The National Industrial Classification data of Census of India for Assam shows that persons engaged in manufactures of bamboo and cane furniture and fixtures and other related non-timber based products show 148.5 per cent growth during the period 1971-91. Whereas persons engaged in timber based industries show 72.6 per cent growth during the same period in the state. This shows the possibilities of sustainable job opportunities in NTFP sector.

Table 7.35: Growth of Workers Engaged in wood based industries

Industries	NIC code	1971	1991	Growth rate
Wood and Wood Products	27			72.6
Wooden and cane boxes, baskets, made entirely or mainly of cane, rattan, reed, bamboo, willow, fibres, leaves, grass etc.	272- 1970 273- 1987	3,411	3,867	13.37
Manufactures of bamboo & cane furniture and fixtures	277	2,420	9,030	273.14
Manufactures of products of wood, bamboo, cane, reed and grass	279	1,313	4,857	267.91
	Total workers in NTFP	7,144	17,754	148.5
Wooden goods, treated timber	273 - 1970 272 - 1987	11,709	7,437	-30.5
Manufactures of wooden furniture and fixtures	276	10,927	22,599	106.8

Source: Census of India, Economic Tables, Assam 1971, 1991
Note: National Industrial Classification 1970 modified to an extent in 1987

7.8.6 Social Forestry Programme in the State

117. The pressure of population for settlement and grazing, the removal of forest cover for timber and firewood, and the shifting cultivation put together have led to massive depletion of the forest cover. This has led to implementation of various forestry development programmes such as afforestation and social forestry, wildlife management, improvement of infrastructural facilities, etc. by the forest department of

the state. The social forestry programme aims at increasing area under afforestation in the residential areas and otherwise occupied areas of the state. The achievement of the programme during the year 1998-99 was not very encouraging. During that year 4646 hectares could be covered against the target of 4958 hectares. However, in the previous year the modest target to cover 2357 hectare had been achieved (See Table 7.36). The number of seedling planted under the programme was 25 lakh during 1998-99, 59.32 lakh during 1997-98 and 147.66 lakh during 1996-97 (See Table 7.37). The records of seedling distribution by the forest department show that more that 4 crore of seedlings have been distributed during the year 2000. It is estimated that about 30 per cent of the seedlings were actually planted and maintained.

Table 7.36: Target and Achievement of Social Forestry (in hectares)

		1996-97		1997-98		1998-99	
Sl.	Districts	Target	Achievement	Target	Achievement	Target	Achievement
1	Dhubri	683.00	682.00	386.00	386.00	487.75	273.00
2	Kokrajhar	400.00	400.00	157.00	159.00	347.00	347.00
3	Bongaigaon	774.75	772.75	256.00	259.00	512.75	361.00
4	Goalpara	523.00	523.00	152.00	152.00	918.00	918.00
5	Barpeta	336.00	336.00	148.00	150.00	319.00	319.00
6	Nalbari	382.00	382.00	165.00	166.00	141.00	141.00
7	Kamrup	858.00	858.00	208.00	208.00	249.5	248.5
8	Darrang	9.00	9.00	11.00	11.00	96.5	94.5
9	Sonitpur	75.00	75.00	Nil	Nil	181.00	182.00
10	Lakhimpur	59.00	57.00	14.00	14.00	225.00	221.00
11	Dhemaji	173.00	173.00	53.00	55.00	71.00	72.00
12	Morigaon	15.00	14.00	Nil	Nil	11.00	12.00
13	Nagaon	21.00	21.00	15.00	15.00	148.00	146.00
14	Golaghat	148.00	147.00	212.00	213.00	328.00	300.00
15	Jorhat	219.5	237.5	Nil	Nil	10.00	10.00
16	Sibsagar	408.00	408.00	257.00	259.00	254.00	253.5
17	Dibrugarh	40.00	40.00	4.00	4.00	76.00	76.00
18	Tinsukia	106.00	106.00	Nil	Nil	142.00	142.00
19	Karbi Anglong	3154.00	Nil	Nil	Nil	Nil	Nil
20	N.C.Hills	1894.00	Nil	Nil	Nil	Nil	Nil
21	Karimganj	275.00	275.00	154.00	156.00	222.5	222.5
22	Hailakandi	70.00	70.00	6.00	6.00	1.00	100.00
23	Cachar	322.00	322.00	159.00	160.00	217.00	207.00
		10945.25	5908.25	2357	2373	4958	4646

Source: Principal Chief Conservator of Forest, (Social Forestry)

Table 7.37: Seedlings Planted under the Social Forestry Programmes in the Districts of Assam (in hectares)

		1996-97		1997-98		1998-99	
Sl.	Districts	Target (In Hect.)	Achievement	Target (In Hect.)	Achievement	Target (In lakh.)	Achievement
1	Dhubri	N.A	17.07	N.A	9.65	2.00	2.00
2	Kokrajhar	N.A	10.08	N.A	3.97	1.80	1.80
3	Bongaigaon	N.A	19.31	N.A	6.47	0.80	0.80
4	Goalpara	N.A	13.07	N.A	3.80	0.60	0.60
5	Barpeta	N.A	8.40	N.A	3.75	2.50	2.50
6	Nalbari	N.A	9.55	N.A	4.15	2.00	2.00
7	Kamrup	N.A	21.45	N.A	5.20	2.00	2.00
8	Darrang	N.A	0.22	N.A	0.28	1.20	1.20
9	Sonitpur	N.A	1.87	N.A	-	1.00	1.00
10	Lakhimpur	N.A	1.42	N.A	0.35	0.45	0.45
11	Dhemaji	N.A	4.32	N.A	1.38	0.60	0.60
12	Morigaon	N.A	0.35	N.A	-	0.45	0.45
13	Nagaon	N.A	0.52	N.A	0.37	1.00	1.00
14	Golaghat	N.A	3.67	N.A	5.33	0.60	0.60
15	Jorhat	N.A	5.92	N.A	-	0.70	0.70
16	Sibsagar	N.A	10.20	N.A	6.47	0.50	0.50
17	Dibrugarh	N.A	1.00	N.A	0.10	0.45	0.45
18	Tinsukia	N.A	2.65	N.A	-	0.60	0.60
19	Karbi Anglong	N.A	-	N.A	-	2.00	2.00
20	N.C.Hills	N.A	-	N.A	-	2.00	2.00
21	Karimganj	N.A	6.87	N.A	3.90	`0.50	0.50
22	Hailakandi	N.A	1.75	N.A	0.15	0.45	0.45
23	Cachar	N.A	8.05	N.A	4.00	0.80	0.80
			147.74		59.32	24.5	25

Source: Principal Chief Conservator of Forest, (Social Forestry)

118. The forest department has different programme for regeneration of the forest areas of the state (See Table 7.38). However, the achievement of such programme was far below the target set in 1998-99. It is attributed to lack of adequate fund to carry out such programme. The costs of afforestation per hectare for different plantation are shown in Table 7.39. The forest department also says that most of the areas where regeneration can be taken up are encroached by people. Prior to the Supreme Court ban there was enthusiasm among the people to go for teak and other plantations with expectation of high return in later years. The ban may be the one of the causes for slump in the regeneration programme. It is also estimated that the survival percentage of plantation is around 75 per cent.

119. It is sometimes said that social forestry programme in the state has not achieved the desired result. However, if we look at the data on district-wise performance of the social forestry programme in the state, it reflects that the overall failure in the state is due to non-performance by the hill districts of the state, where forest is managed by their respective district councils not by the state forest department. Moreover, even after successful implementation of the programme in the initial years some districts in

the valley region could not improve their performance. It seems that the motivational and operational aspects vary among the implementing agencies at the local level.

Table 7.38: Achievement under various Forestry Programmme (area in hectare)

Programme	1995-96	1996-97	1997-98	1998-99
1. Regeneration	1071	1555	6622	1329
2. Regeneration of Degraded Forest	954	760	1679	507
3. Quick Growing Species	1333	2115	2740	2148
4. Plywood	903	1230	2857	700
5. Teak Wood	738	1138	3728	240
6. Match Wood	422	800	2535	1601
7. Minor Forest Yield	5421	7538	-	-

Source: Principal Chief Conservator of Forest, (Social Forestry)

Table 7.39: Cost of Different Plantation Scheme

Sl. No.	Plantation scheme	Total cost per hectare
1	Matchwood plantation	Rs 5200.00
2	Plywood plantation	Rs 8700.00
3	Quick growing species	Rs 6100.00
4	Teakwood plantation	Rs 6000.00
5	Regeneration of degraded forest	Rs 6500.00
6.	Regeneration a) under planting	Rs 3900.00
	Regeneration b) Sal	Rs 17800.00
	Regeneration c) Hardwood	Rs 8200.00
	Regeneration d) Hollong	Rs 3900.00

Source: Principal Chief Conservator of Forest, (Social Forestry)

120. There are four components of social forestry programme in the state- (a) Social Forestry General, (b) Tribal Sub Plan, (c) Schedule Caste Component Plan and (d) Area-oriented Fuelwood and Fodder Project. The implementation of these programmes is more visible in the districts of lower Assam, namely Dhubri, Kokrajhar, Bongaingaon, Goalpara, Barpeta, Nalbari and Kamrup (See Table 7.40). It again reflects the motivational and operational variations at the local level in the implementation of state conducted programme in the state.

Table 7.40: Components of Social Forestry in Assam

Districts	Social Forestry General		Tribal Sub Plan		Scheduled Caste Component Plan		Area Oriented Fuelwood and Fodder Projects	
	1997-98	1998-99	1997-98	1998-99	1997-98	1998-99	1997-98	1998-99
Dhubri	175.00	110.00	Nil	2.00	11.00	61.00	200.00	100.00
Kokrajhar	57.00	84.00	Nil	50.00	2.00	16.00	100.00	200.00
Bongaigaon	59.00	151.00	Nil	52.00	Nil	58.00	200.00	100.00
Goalpara	Nil	202.00	Nil	551.00	2.00	5.00	150.00	160.00
Barpeta	Nil	97.00	Nil	56.00	Nil	31.00	150.00	135.00
Nalbari	1.00	51.00	Nil	34.00	15.00	6.00	150.00	50.00
Kamrup	Nil	37.50	Nil	2.00	8.00	9.00	200.00	200.00
Darrang	9.00	66.00	Nil	6.00	2.00	22.50	Nil	Nil
Sonitpur	Nil	83.00	Nil	51.00	Nil	48.00	Nil	Nil
Lakhimpur	Nil	64.00	Nil	129.00	14.00	28.00	Nil	Nil
Dhemaji	Nil	20.00	Nil	Nil	55.00	52.00	Nil	Nil
Morigaon	Nil	7.00	Nil	Nil	Nil	5.00	Nil	Nil
Nagaon	5.00	126.00	Nil	Nil	10.00	20.00	Nil	Nil
Golaghat	Nil	110.00	Nil	61.00	13.00	6.00	200.00	123.00
Jorhat	Nil	2.00	Nil	Nil	Nil	8.00	Nil	Nil
Sibsagar	Nil	60.00	2.00	43.50	7.00	Nil	250.00	150.00
Dibrugarh	Nil	50.00	1.00	11.00	3.00	15.00	Nil	Nil
Tinsukia	Nil	107.00	Nil	Nil	Nil	35.00	Nil	Nil
Karbi Anglong	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
N.C.Hills	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Karimganj	1.00	107.00	Nil	31.00	5.00	34.5	150.00	50.00
Hailakandi	Nil	35.00	Nil	Nil	6.00	15.00	Nil	50.00
Cachar	Nil	76.00	Nil	10.00	10.00	31.00	150.00	100.00
		1642.5		1089.5		506		1418.00

Source: Principal Chief Conservator of Forest (Social Forestry)

7.8.7 Joint Forest Management in the State

121. The Indian forestry sector has witnessed a major policy shift during the last decade towards a more decentralized and people oriented-forestry. Following the June 1990 resolution of the Government of India, the Joint Forestry Management (JFM) programme was formally introduced in the country. The philosophy of JFM in essence aims at involving people in resource generation through motivation, and eliciting their participation in forest management and sharing of benefits through adequate institutional arrangements (TERI report on JFM, 2001).

122. Recently the forest department changed its approach towards the regeneration of forest programme. The Government of Assam has worked out a resolution for JFM programme. For JFM programme the selected site including all areas outside reserved forest and peripheral areas of reserved forest shall be worked out in accordance with a working scheme prepared in consultation with the beneficiaries and duly approved by the concerned forest officer. The area of JFM committee may usually be limited to five hectare for natural regeneration and two hectare for intensive planting. The unit for

natural regeneration and artificial regeneration will depend upon the number of beneficiaries. However, the unit should be viable for effective protection and management.

123. The divisional forest officer shall select the beneficiaries for the purpose of constituting of the forest protection and regeneration committees in consultation with the local panchayats. The beneficiaries are to be identified from economically backward people of homogenous groups living in the vicinity of the forest concerned.

124. There is a provision in the resolution for a supportive role of the gram panchayats in the JFM committees. Non Government Organizations (NGOs) and Voluntary Organizations (VOs) of the locality should be utilized for motivating and organising village communities for protection, regeneration and afforestation purposes. The NGOs and VOs may be associated as interface between the forest officers and village communities. The resolution decided to follow the provisions made under the Assam Forest Regulation Act of 1891, the Wildlife (Protection) rules of 1980 and the Forest (Conservation) Act of 1980 in the successful implementation of JFM programme.

125. It is the responsibility of the concerned divisional forest officer to monitor, supervise and resume the functions of JFM committees. The resolution says the beneficiaries will have to protect the forest for at least five years to be eligible for sharing usufructs under natural regeneration scheme of JFM. Time bar for sharing usufructs in the case of artificial regeneration areas will be worked out according to the silviculture requirements. The beneficiaries will be permitted to collect minor forest produce, fallen leaves and wood and fodder free of cost without causing damage to forests/plantations. The beneficiaries are entitled to utilize the forest products for their bona fide needs. They can also use the forest products, but it should be ensured that the benefits of people's participation should go to the village communities and not for commercial purpose.

126. After meeting the legitimate needs of the beneficiaries and for community purpose, the surplus out of the harvest from silviculture thinning and the main felling shall be sold by the Forest Department and the JFM committee will be entitled to 50 per cent of the net receipts.

127. The philosophy of the JFM programme sounds good. Here the people will operate and the government will cooperate in the protection of the forest and ecology as well as people will get the benefits from the forest. However, the progress of JFM is somewhat slow in the state (See Table 7.41). The JFM programme was introduced in the State of Assam in November 1998. Till now only the committees have been formed for JFM programme. Altogether 245 committees have been registered for JFM in Assam till May 2001 and among them 82 committees are all women committees. These committees plan to cover 6970 hectares of land. Out of which 5070 hectare area under reserved forest and rest of the area under Government community land. These committees plan to cover 6970 hectares of land. There are several reasons for the slow progress of JFM in the state. JFM plans to involve people living in the forest villages and villages in the vicinity of the forest. They are largely depended on forest for their

livelihood. The beneficiaries of the JFM committees have to protect the forest for 5 years to be eligible for sharing the usufructs. There is need to make provision for other support activities for the people to be involved in JFM. There is need for creation of assets and other activities such as animal husbandry, horticulture, bamboo cultivation, roads etc. for the people to be involved in the JFM. The Forest Department of the state so far has been unable to do these for paucity of fund. Unless an alternative arrangement for livelihood is made, at least during the period of regeneration of forest, these people have no option but to exploit the forest resources often beyond their sustainable limits. Thus JFM should be coupled with other development programmes.

Table 7.41: Status of Joint Forest Management in Assam- May 2001

		Number of JFM Committees	Area covered in Hectare	All Women JFMC
1	Reserved Forest	196	5070	40
2	Government Community Land	49	1900	42
		245	6970	82

Source: Chief Conservator of Forest (Social Forestry) Assam

128. Moreover, no rule has been made for operationalization of JFM. At present, the JFM Committees are being registered in various division under social forestry wing as per the provision under rule 7 (i) to (xi) contained in the Assam Joint (Peoples Participation) Forestry Management Rules 1998. However, the Forest Protection Division of Ministry of Environment and Forest has suggested that all JFM Committees are to be registered under the Societies Registration Act of 1860. However, the Act of 1860, in Assam has no provision for registration of forest protection committees. The meeting of the divisional forest officers and chief conservators of Assam for the operationalization of JFM decided that the registration of JFM committees may be taken up in the initial stages under the Assam Joint (Peoples Participation) Forestry Management Rules of 1998 as there are adequate provisions under this rule (Report of the Chief Conservator of Forest, Social Forestry, 2001).

129. The JFM resolution for the state says that the cost of regeneration and maintenance of degraded forests and allied developmental works as per the approved scheme shall be borne by the government. Provision has been made to distribute the required fund to the JFM committees through the divisional forest officers. It is alleged that in most of the cases a few affluent people without active involvement of economically backward local people, form the JFM committees on paper and they siphon off fund from the Forest Department with the help of some forest officials. They take no initiatives for regeneration programme. All these have jolted the take off of JMF programme in the state.

130. However, some cases of success can be cited in the state. Dhubri, a lower Assam district has shown success in the social forestry programme (See Box A). Such

examples of synergy in development initiative by the people as well as the government are not many.

Box A: JFM and Rural Development

In a tiny village, Bashbari, near Golakganj, the JFM progamme is taking its stride (The Assam Tribune January 19, 2001). Here for years trees were illegally being felled. As a result there was soil erosion and sharp drop in the level of water table. A forest protection committee was formed in 1984, much before the formal launch of the JFM programme in the country to work towards the maintenance, protection, plantation and development activities in the region. Now illicit felling and cattle grazing has come to an end in the reserve forest of this region. The Forest Department is employing the forest protection committee to carry out the plantation in the forest, nursery raising and other support activities like laying out roads, boundary demarcation of reserve forest area etc.

7.8.8 Commercial Logging and Wood Industry

131. Unfortunately, the Supreme Court ban continues even after five years. The State Forest Department was given a time limit of two years (that is, till January 2000) to produce working plans for sustainable use of forests. It was found that just 11 divisions had prepared plans till June 2001. Rests of the divisions have not prepared plans for want of funds. (Why are funds needed to prepare plans only the forest department can explain)?

132. Even when the working plan for sustainable forestry is developed, how would one ensure that these are honestly implemented? Parikh (1999) has suggested a way to use markets for sustainable forestry, which is represented, in Box B.

7.8.9 Strategies for Sustainability of Forests in Assam

133. Involvement of local people in protection and management of the forest seems to be the only way out for sustainability of forest area in Assam at least as far as meeting needs for fuelwood, fodder and other non-timber forest products are concerned. There is a shift in the approach in the Forest Policy of 1988 with more focus on involvement of people is in the right direction. However, the people oriented JFM has not able to make its impact in Assam. The following steps must be taken into account for successful implementation of the JFM programme in the state.

    a. The service from the poor villagers in the management and protection of forest cannot be expected unless economic security is provided to them. In most cases they are fully or partially dependent on the forest for their livelihood. There is need to make provisions for other support activities for the people to be fully involved in JFM. Creation of assets and other activities such as horticulture, animal husbandry, bamboo cultivation, etc. is an essential prerequisite.

Box B: Using Markets for Sustainable Forestry

Another example where financial market can play an allocative role is in sustainable exploitation of forests. Today, a forest contractor has no incentive to nurture the forest assigned to him. He would like to fell it. The forest department is forced to micro-manage his actions, but the forest department officials are only human. Over the last 50 years, the area under the forest department has risen, but the area under forests has gone down.

The problem arises from the fact that the ownership of the forests is not with the contractor. If forests were privatized, however, there is no guarantee that they would be maintained as forests. Even if the land contained trees, the private owner may prefer a commercial plantation with inferior bio-diversity.

One can think of giving our forests on long-lease to private firms with a stipulation that a forest of the same quality (as defined by some objective metrics about bio-mass, bio-diversity etc.) will be returned in 15 years. The failure to do so would evoke substantial penalties. However, how would we ensure that the terminal conditions generate altered behaviour today? One way out is to require that these leases are only given to joint-stock companies with shares which are meaningfully traded on the stock market.

The stock market would know that a large penalty awaits the company if the forest is not maintained in adherence of certain minimal standards. Security analysts today visit the plants of companies that they cover; it is not unreasonable to think that they would visit the forests that are comparable productive assets. The stock market would do this monitoring in a more efficient and corruption - free fashion as compared with any bureaucratic organisation.

Similarly, it is feasible for voluntary environmental groups to visit a given forest once in 15 years and verify the correct calculation of penalties. In contrast, it is infeasible for them to ensure the honest day-to-day micro-management by the forest department that is required to produce good behaviour on the part of forest contractors. Of course, markets are not a perfect and infallible monitoring instrument. Yet, they offer a much better chance of success than our current system of control by fallible human bureaucrats.

b. There is the need to think of evolving a cost-effective alternative to fuelwood to the villagers; otherwise they will continue to exploit the forest. The use of kerosene and LPG is minimal in most of the villages due to their low economic status. There is scope and necessity to exploit rural energy components (improvised chulla etc.) with the JFM programme.
c. In most cases the villagers find it difficult to comprehend the mechanisms of the functioning of JFM. A massive motivational and training programme for the people to be involved in JFM can help to serve the objective. The service of VOs can be utilized for this purpose.

134. The other steps need to follow are:

a. All stringent forest laws must be put into action in actual practice. Some corrupt officials who themselves break the rules provide forged transit passes to smuggle out the illegal timbers.

b. Unrestricted encroachment must be stopped in the forest areas of Assam. The rapid population growth in the state has put pressure on the land of Assam. So, the people have encroached the forest areas. The Revenue Department of the state is stated to be the main culprit as the department is providing *patta* (settlement rights) to the settlers in the forest areas. The National Forest Policy, 1988 states that diversion of forest land for any non-forest purpose should be subject to the most careful examinations by specialists from the standpoint of social and environmental costs and benefits.

c. Every forest division in the state is supposed to have a working plan. The working plan acts as a guide for rational exploitation of the forest. However, most of forest divisions have not prepared their working plan. As reported by the forest department only 11 divisions have at present current and approved working plans. These must be prepared urgently to vacate the Supreme Court ban. Even with such plans there may be difficulties in reviving forest-based industry in Assam. The working plans act as a guide for rational exploitation of the forest. The National Forest Policy of 1988 lay down that the forest-based industries should meet its raw material need from private plantations. It states "as far as possible, a forest-based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services" (Ministry of Environment and Forest, 1988). However, the Forest Conservation Act of 1927, governs the felling of trees in private holdings. Only through amendment of this contradiction and encouraging large-scale plantation of quick growing species (QGS) the forest-based industries of the State can be revived.

d. Innovative use of market mechanism may be made to promote sustainable forestry, through long-term lease and penalty for misuse monitored by the stock market.

e. Jhuming (shifting cultivation) in the hill areas must be stopped through stringent regulations. The Assam Forest Regulation, 1891 (the act has undergone changes many times during 1892 to 1988) does not have any clear cut provision for banning jhum cultivation. It states that jhuming can be done with the written permission from the Forest Settlement Officer, or any clearings lawfully made for jhum cultivation by persons in the habit of practising such cultivation in the hills. If any claim relating to the practice of jhuming is made the Forest Settlement Officer records a statement setting forth the particulars of the claim and of any local rule under which the practice is allowed or regulated and submit to the state government, together with his opinion whether such practice should be permitted or prohibited. So, in the

Assam Forest Regulation, 1891, there is no provision for complete ban on jhuming in the state.

f. Area covered by the forest may not give the actual status unless the density of the forest is not taken into account. There is need to use the information of remote sensing for regular monitoring of the forest areas in the state along with their crown densities.

g. There is the need to evolve alternatives to timber for meeting household and industrial consumption requirements. The Forest Policy, 1988 states that the long-term solution for meeting the existing gap lies in increasing the productivity of the forests, but to relieve the existing pressure on forests for the demand of railway sleepers, construction industry (particularly in the public sector), furniture and panelling, mine-pit props, paper and paperboard, etc. substitution of wood needs to be taken recourse to. Similarly, on the front of domestic energy, fuelwood needs to be substituted as far as practicable with alternate sources like bio-gas, LPG and solar energy. Nowadays there is an increasing trend to use fabricated steel in lieu of wood, mostly in urban areas of the state. Utilization of forest resources for industrial development and revenue generation is not a viable proposition considering the present ecological condition of the state. The present focus should more be on regeneration and protection of the forest for next few years.

h. There is need to strengthen the Forest Protection Task Force. The outdated 303 rifles are not enough to counter the sophisticated weapons used by the poacher.

i. Above all massive plantation is the way out for sustainability of the forest areas of the state.

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8 Tourism in Assam: Status and Prospects

8.1 Introduction

1. North-East India is a paradise for tourists. Its enchanting hills, dancing rivers, roaring waterfalls, thick and dark forests, heavy rains during monsoon, innumerable varieties of flora and fauna, countless species of wild animals and plants, mysterious clouds, melodious folk music, thrilling dances and festivals, variety of many delicious dishes, handlooms and handicrafts, and above all its green landscape used to attract people from different parts of the world since time immemorial. Assam, one of the constituent states of the region, an embodiment of the natural beauty and grace, a true representative of the region, has been at the centrestage of tourist attraction. The recorded history tells that since the days of Hieu-en Tsang, the great Chinese traveller, who came to Assam during the reign of Kumar Bhaskar Burman (594-650 AD), Assam has been fascinating millions of people by its aura of myths, mystery, music, mountains, nay, all the gifts of nature. The ungrudging blessings of nature have made tourism in Assam essentially nature-centric, despite the fact there are historical and religious places of tourist attraction.

2. Tourism has generated employment in different parts of the country. Besides creating opportunities for tourist guides, conducted tours, establishment of hotels, and so many other avenues in the tertiary sector, tourism can be a major source of employment in Assam. It is argued that every domestic tourist can generate direct and indirect employment of three persons, and this can be higher (seven) in the case of inflow of every foreign tourist. It is also projected that every one million rupees invested in tourism, 47.9 direct jobs can be created, besides, of course, creating more avenues for indirect employment. Yet paradoxically it attracts very few tourists. Why? What can we do about it?

8.2 Tourism Potential

8.2.1 Existing places of tourist attraction

3. As stated already, tourism in Assam is essentially nature based, therefore, natural parks and sanctuaries, rivers, lakes, warm water springs, forests, wild life, are the principal components of tourist attraction. These places can be grouped together under four categories: (a) nature-related, (b) historical, (c) religious and (d) others.

(a) Nature related:

Places in alphabetic order	Distance from Guwahati in km	Speciality
1. Bhairabkunda	137	A beautiful place at the border of Arunachal Pradesh
2. Bhalukpung	205	A beautiful place by the side of river Jia Bhoroli, famous for angling and water sports
3. Chandubi	64	A natural lagoon, beautiful picnic spot
4. Dibru-Chaikhowa	490	70 km from Dibrugarh, national park, the habitat of elephants, buffaloes, famous for wild horses
5. Haflong	355	One of the hill stations in Assam with unsurpassed sylvan beauty
6. Jatinga	364	Near Haflong, North Cachar district, a beautiful hilly place, where birds behave in a mysterious way, the local people call that the birds commit suicide here on certain specific days
7. Kaziranga	217	Internationally famous national park, the home of great Indian one-horn rhinoceros, tigers, elephants, buffaloes, deer, wild ducks and geese, breeding place of pelicans, habitat of reptiles and monkeys more particularly golden langurs and host of other species
8. Manas	176	Situated in the foothills of the Himalayas, one of the magnificent national parks in the country, the Manas river flows through it, famous for the tiger project, a habitat for various wild animals
9. Orang	150	A wild life sanctuary, known as a miniature Kaziranga
10. Pabitara	65	A wild life sanctuary
11. Potasoli	173	38 km from historic town of Tezpur, near the picturesque river Jia Bhoroli, famous for eco-camp set up jointly by the Department of Forest and Assam Anglers Association

Source: Directorate of Tourism, Guwahati

Wildlife

4. An attractive feature of the Assam's forestry is its colourful wildlife. Some of species are exclusive to the state. Assam is famous for as the home of one-horned rhinoceros. Some of the endangered species found in the state are hollock gibbon, the stamp tailed macaque, the capped langur, the golden langur, the pigmy hog, the clouded leopard, the golden cat, the white winged wood-duck, and the like. All these can make Assam as one of the best destination of the tourists.

5. There are five National Parks and eleven wildlife and bird sanctuaries for protection and preservation of wildlife in the state. The five National Parks – Kaziranga, Manas, Nameri, Orang and Dibru-Saikhowa covers an area of 1561.14 sq km. The total area covered by eleven wildlife and bird sanctuaries is 492.97 sq km.

6. The Assam National Park Act, 1968 was enacted for the preservation and protection of flora and fauna in the wildlife parks and sanctuaries. The Assam Forest Protection Force Act, 1986 was enacted for better protection and security of the forest produce. However, the state of affair in the Forest Protection Force is sad. This is testified to by the fact that the endangered species like rhinoceros are the regular victims of human lust and there is hardly any visible preventive measure to stop such acts of poaching. The forest guards are still with outdated equipment to counter the poacher with sophisticated arms.

(b) Religious

Places in alphabetic order	Distance from Guwahati in km	Speciality
1. Barpeta	137	Famous for a Vaishnava monastery
2. Batadrawa	134	Birth place of Shri Sankardeva, the Vaishnava reformer, saint and a great literary figure
3. Hajo	35	Sacred place for Hindus, Muslims and Buddhists
4. Kamakhya		An important religious place of the Hindus within the city of Guwahati, on the top of Nilachal hill, attracts thousands of devotees and other tourists every day by its natural grandeur
5. Madan Kamdev	35	Vast archeological ruins of fine erotic sculpture
6. Majuli	326	The largest river island in the world, centre of Vaishnava culture, seat of many satras which are known as the centres of Assamese art, dance, drama, music, a safe heaven for various migratory birds
7. Surya Pahar	162	Situated on a hill surrounded by innumerable statues of Durga Devi, Ganesha, Surya, Chandra, Buddha

(c) Historical

Places in alphabetic order	Distance from Guwahati in km	Specialty
1. Digboi	523	Famous for the first oil refinery in Asia, war cemetery of World War II
2. Sibsagar	369	Seat of the Ahom rule, famous for royal palaces, monuments, temples and massive ponds
3. Tezpur	137	Ruins of an ancient capital of the Mahabharata time, famous for the love story of Usha-Anirudha

Source: Directorate of Tourism, Guwahati

(d) Others

7. **Guwahati**: Situated on the bank of the mighty river Brahmaputra, it is a fast growing metropolis. Though unplanned, it is the gateway to the North-East India. It is well connected with the rest of India by rail, road and air. The airport, known as Gopinath Bordoloi airport, is being upgraded to an international one. The places of worth visiting are: the famous Shakti

temple of mother Goddess Kamakhya on the Nilachal hills, the ancient Siva temple Umananda situated on the Peacock island in the middle of the river Brahmaputra, the Navagraha temple, Srimanta Sankardeva Kalakshetra, Balaji temple, Science Museum, Vaisisthashram (founded by famous sage Vaisistha amidst grand natural beauty), the State Museum, the State Zoo-cum-Botanical garden, the Saraighat Bridge, the Lachit Barphukan Park etc.

8. Sualkushi: 32 km from Guwahati, known as the silk town of Assam, it is famous for Assamese silk, muga (golden thread) and other varieties of silk.

Potential to Attract Tourists of Diverse Interests

9. The above list shows that there is an ample scope for tourism to grow as an industry in with it diverse endowments of tourist interests. The following are the existing and potential variety of tourism:

a. Nature Tourism

10. Assam and its six neighbouring states of the North-East are known for their bio-geographic richness (Coopers and Lybrand Report, 1996, p. 49). With its dense forests, uneven topography, flora and fauna, the majestic Brahmaputra and its tributaries, wild life sanctuaries like Kaziranga, Manas, Pabitara, Dibru-Saikhowa, Bhalukpung, Pabitara and similar others, and many rare species of animals, Assam offers basically nature-centric tourism. From one end to the other, the state offers to the tourists so many places of natural beauty with wide variety of wildlife that very few places in the world can compete with it. Nature tourism understood in terms of wildlife sanctuaries constitutes the core of tourism in Assam. The tourists, both domestic and foreign, are likely to find these places attracting, nay alluring, provided a well-definite programme of action is evolved.

b. Tea Tourism

11. Tea was first discovered in Assam in 1823 by two intrepid British adventurers, Robert and Charles Bruce and since then tea has become an integral part of Assam's economy. Each of these lush green tea gardens in Assam (about 1000 in number) is a treasure house of exotic beauty of nature with colourful people and their enchanting songs and dances, sprawling bungalows, and residential facilities. Many of these tea gardens have polo flelds and golf courses. There are as many as 30 air strips and helipads maintained by the tea garden management. These facilities can form into an attractive package for tourism. The road communication to most of the tea gardens is fairly well maintained, and the rest houses and bungalows with modern facilities located there are generally kept ready for visitors and guests. Therefore, coordination with the management of the tea gardens can effectively do a lot in promoting tea tourism in the state. It may be noted that tea tourism is a recent concept, its potentiality, remains unexplored.

c. Eco-tourism

12. Eco-tourism is also a new concept, developed around the idea of travelling to places of natural beauty, moving around and staying with the places of nature for a couple of days. It has the twin objectives of conserving environment and improving the welfare of the local people. Countries like Kenya, Costa Rica, South Africa have already successfully promoted eco-tourism. Kerala presents a unique success story of eco-tourism in our country. On this similar line, Assam has immense scope for eco-tourism, as its natural scenario and climatic condition resemble those in Kerala. The state is virtually free from industrial pollution. Its green forests, blue hills, enchanting rivers are the basis on which an eco-friendly tourism can be developed. For that a host of matters to be properly addressed, including: (a) development of good approach road to the spots of tourist attraction, (b) creation of infra-structural facilities like good quality tents with provisions for food and other logistics, (c) river cruising and water sports, bird watching towers etc. These facilities are likely to attract eco-tourists. It may be noted that eco-tourism is yet to come to the take-off stage.

d. Cultural Tourism

13. Assam is a conglomeration of various ethnic tribes and groups each having a distinct language, culture, way-of-life, festivals, songs and dances. Most of these people have their spring festivals. Songs and dances, display of colourful dresses, tasting of innumerable varieties of both vegetarian and non-vegetarian dishes mark these festivals. Sankardev Kalakhetra, Guwahati, has been organising, in recent years, spring festivals, on the line of the desert festival of Rajasthan, the Rangali Utsav in the month of April in which the various colourful shades of Assam are presented. This could be as big an attraction as the Pushkar Mela in Rajasthan.

e. Pilgrim Tourism

14. Assam has many ancient temples and shrines, some of which like Kamakhya date back to pre-historic time. As stated already Kamakhya is one of the most revered religious places in the country. An average of 1000 visitors visit the Kamakhya temple every day throughout the year. It becomes a centre of attraction in the month of June when it celebrates the Ambubchi mela. At that time more than hundred thousand pilgrims come for pilgrimage from different places of India. Situated on a hill top Kamakhya is also a very beautiful place that attracts many tourists. There are other religious places where visitors often come from different parts of the country. But most of the places do not provide adequate facilities to the tourists and pilgrims, for which these places of religious importance fail to attract a large number of tourists.

f. Adventure Tourism

15. The enchanting blue hills and speedy rivers of Assam provide an enormous scope for the development of adventure tourism. Recently, some of the adventure sports activities like rock-climbing, trekking, para-sailing, water sports, river rafting and angling are promoted by the Department of Tourism. There is an annual angling competition held at Bhalukpung-Potasali side every year in November in which Indian and foreign tourists participate. But other areas of adventure tourism like hang gliding are yet to grow. Assam has a number of ideal places like Nilachal hills (where the Kamakhya temple situated) in the city of Guwahati and the hills around Kaziranga. Since most of the tourists come to the state through Guwahati and visit Kaziranga, there is an enormous scope for hang gliding.

g. Golf Tourism

16. There are about 10 golf courses located mostly within the compact areas of tea gardens. The Oil India maintains a very good golf course in the industrial town of Duliajan. These offer a unique opportunity to develop golf tourism in the state. Most of the courses are located near to air-strips and helipads maintained by the tea garden management. In recent years, domestic and foreign tourists are coming to play golf in different golf courses, and a good number of them use these air-strips and helipads. Golf tourism can be integrated with eco and tea tourism. One has to recognize that some tourists may more than one interest and may like to combine various aspects of tourism described above.

8.3 Status of Tourism

17. In a recent statement, Mr M P Bezbaruah, Union Tourism Secretary, said that the inflow of foreign tourists in India has registered a 6 per cent growth in 2000-01. The absolute figure is 2.7 million people from abroad. Foreign tourists fetched $3 billion to the Union exchequer making tourism the second highest net foreign exchange earner in the country.

18. However, Assam does not present a happy picture. Only 0.22 percent of the foreign tourists visiting India last year made Assam their destination. Table 8.1 presents the inflow of both domestic and foreign tourists to Assam:

Table 8.1: Tourist Inflow to Assam 1995-2000

Year	Indian	Foreign
1995	348,532	2,575
1996	327,260	5,885
1997	842,656	4,194
1998	939,721	3,843
1999	964,939	5,218
2000	1,001,577	5,959

Source: Directorate of Tourism, Assam

19. It is noteworthy that the tourists visit Assam throughout the year. But the peak period starts from October when the rainy season comes to an end, the climate becomes more pleasant and the national parks like Kaziranga are opened for the visitors. The peak period continues till April when the national parks are closed due to rain and other accompanying problems. The figures stated in Table 8.1 include only those who those who visited he places listed in the directory of Tourism and stayed at tourist lodges of the State Tourism Department, hotels, inspection bungalows and Kamakhya Temple's accommodation. The revenue earned for last four financial years are stated in Table 8.2.

Table 8.2: Revenue Earned from Tourists (Rs '000)

Year	Directorate of Tourism	ATDC[@]	Total
1996-97	3,688	NA	3,688
1997-98	2,743	1,972	4,715
1998-99	3,105	1,979	5,084
1999-2000	3,172	3,226	6,398

Source: Directorate of Tourism, Assam [@]Assam Tourism Development Corporation

20. It is evident from the two Tables that there has been some increase in tourist traffic as also in the revenue earning from tourism despite the fact the law and order situation in the state has not been satisfactory and insurgency activities are rife. These data, however, do not present an idea about the spillover revenue and employment generation in the state. They also do not indicate an idea about the income and employment generated in the tertiary sectors associated with tourism.

8.4 What has ailed Assam's tourism?

21. Despite the fact that Assam has the potentiality of developing tourism in a big way, the statistics shown in Tables 8.1 and 8.2 do not present a happy situation. The reasons are manifold.

a. Absence of a Tourism Policy

22. The Government of India has a policy to develop tourism into an industry and a target to achieve in respect of attracting foreign tourists, who constitute an important source of hard foreign currency. As a result, process tourism has become the second largest foreign exchange earner. It has taken steps to revise the National Tourism Policy, 1982 and to redraft the draft policy of 1993 to envision global tourism based on four S – Swagat (welcome), Suvidha (facilities), Soosna (information) and Suraksha (security). It is said that Assam has a policy on tourism prepared in November 1987. Unfortunately, it is not available in any of the offices connected with tourism. It appears that there was an attempt in November 1987 to formulate a tourism policy and then in December 1992 an exercise was done to frame certain

rules on tourism. It appears that these steps did not bring forth any concrete result. The media, in the recent time has been giving adequate publicity highlighting the importance of tourism in the economic development of the state. Most of the newspapers in both English and Assamese, have been publishing a good number articles in frequent intervals highlighting various aspects of tourism and its potentiality in the sustainable development of Assam. Ideas on this matter are generated through media, but these are yet to be crystallized and institutionalized, as result tourism remains in the domain of ad hocism.

b. Restricted Area Permit (RAP)

23. The RAP to the North-Eastern region was enforced in 1955 in the backdrop of alleged missionary involvement in the Naga rebellion. Under this a foreigner intending to visit North-East including Assam had to undergo a long arduous procedure of obtaining permission from the Home Ministry. With RAP in force till May 18, 1999 it was an uphill task for any foreign tourist to visit Assam and other places in the North-East. Unfortunately, the ghost of RAP still continues to loom large and the efforts to disabuse the false apprehension in the mind of the foreign tourists are minimal.

c. Insurgency

24. Assam, and for that matter almost whole of North-East, has been experiencing violent movements, some of which are secessionists in nature, since 1953 when A Z Phizo fired the first salvo of armed struggle against Indian Union. The foreign and the domestic tourists consider it risky to visit this part of the country, in view of the prevailing law and order situation. The general impression has been that any foreign or domestic tourist could be a soft target of the insurgents. Therefore, they are reluctant to undertake an adventurous journey to Assam and North-East. Contrary to this general impression, however, there is not a single instance of harassment, not to speak of threat to life to any domestic or foreign tourists visiting the region since the outbreak of the Naga movement. But the general impression about the deteriorating law and order situation is enough to ward off any tourist. On the top of this, Manas sanctuary, undoubtedly one of the most beautiful natural parks in the country has been virtually under the control of the Bodo militants for which it is still not considered to safe to visit the place. Recently, Manas has been opened for the tourists, but it will take time to ward off the long-standing impression of the tourists about the sanctuary.

d. Lack of Infrastructure

25. To attract tourists, there must be dissemination of information, infrastructural facilities like good hotels and tourist lodges, affordable and reliable communication network, clean and hygienic food and accommodation, availability of water sports equipment, and the like. Most of the places of tourist attraction are not by the side of the national highways, and approach roads are in bad condition. This is a strong discouraging factor, which works against a good

inflow of the tourist. It appears that the potentialities for developing tourism to a stable source of revenue are not matched by proper policy and strategy.

e. Lack of Coordinated Efforts

26. There is a palpable lack of coordination among several agencies like Department of Tourism and Department of Archaeology in handling the demands of the tourists in places of both historic and religious importance. There is virtually no coordination between various public industries and private sectors like tea industry, oil and coal on one hand, and the Department of Tourism or Assam Tourist Development Corporation (ATDC), on the other, in the efforts towards developing eco and tea tourism. Similarly, there is no tangible and effective coordination between the twin bodies of Assam tourism, that is, the Directorate of Tourism and ATDC on one hand, and road and river transport system run by both Government and private sectors on the other. Therefore, stagnation has been the striking mark of the status of tourism in Assam.

f. Absence of Tourist Guides

27. Assam virtually does not have any trained guides placed in important places of tourist attraction. Consequently, as the tourists arrive at such a place there is hardly anyone to satisfy the inquisitiveness of the tourists. The Department of Tourism initiated a programme to train tourist guides. The effort did not yield good result as most of the trainees left the job. Some of them found other means of livelihood while others found it to be less paying because of the poor inflow of the tourists to the state. It is a chicken-and-egg syndrome which can be resolved by the state government by adopting a two-front strategy – (i) tourist guide training programme for a very limited number of youths, and (ii) setting a target of inflow of the tourists.

8.5 Recent Steps

28. Assam Tourism Development Corporation (ATDC) was set up in June 1988 under the Companies Act of 1956 with the objective to boost tourism in the state. It took over most of the tourist lodges, tourist bungalows, hotels, guest houses, entertainment projects etc., all the means of transport which had been under the control of the Department of Tourism, Government of Assam, and many other functions performed by the said Department to market tourism in the state. Since then it has been making efforts in coordination with the Directorate of Tourism to promote tourism. It prepared an agenda to start as many as 25 new projects. Some of these have been already commissioned and some are in the process of completion. It is expected that ATDC will be able to reduce bureaucratic bungling standing on the way of promoting tourism in the state.

29. It is not out of context to refer to the fact that the ATDC has been earning profit during the last two financial years (See Table 8.3) although its track record was not quite satisfactory.

But if the recent phenomenal trend (profit from Rs 1.1 million to Rs 2 million, which accounts for 82 per cent increase) is maintained, it can definitely fulfill the objectives of the MOA (Memorandum of Association) of 1988.

Table 8.3: ATDC's Net Profit (1994-95 to 1999-2000)

Financial Year	Net profit in Rs
1994-95	700,000
1995-96	400,000
1996-97	1,100,000
1997-98	300,000
1998-99	1,100,000
1999-2000	2,000,000

Source: ATDC, Guwahati

30. Table 8.4 presents the ATDC's turn-over per employee for the last six years. It indicates that the ATDC is not a liability and has the potentiality of contributing to the economy of the state. The slump registered in two years (1997-98 and 1998-99) has been overtaken by the significant growth in 1999-2000.

Table 8.4: Turnover per Employee

Financial year	Amount in Rupees
1994-95	21,000
1995-96	38,000
1996-97	43,000
1997-98	34,000
1998-99	37,000
1999-2000	51,000

Source: ATDC, Guwahati

31. Table 8.5 gives an idea about the projects undertaken by the ATDC. It shows that its physical performance is not satisfactory. Out of 113 schemes carried over for last six years it has been able to complete only 45 schemes. It means that average two schemes have been completed in each financial year.

Table 8.5: ATDC's Physical Performance

Financial year	No. of schemes sanctioned (cumulative)	No. of schemes completed (cumulative)
1994-95	56	38
1995-96	61	40
1996-97	68	42
1997-98	79	42
1998-99	93	44
1999-2000	113	45

Source: ATDC, Guwahati

32. To attract tourists, Assam tourism has been organising tea-tourism and Rongali Utsav in the state as a part of its publicity campaign. These two mega events have been included in the national calendar of festival to get favourable response from both domestic and foreign tourists. These are very recent innovative steps, which are likely to succeed in attracting tourists, both domestic and foreign.

33. During the last four years, the ATDC and the Directorate of Tourism have participated in various fairs and festivals like Travel and Tourism Fair in Kolkata and Mumbai, India International and Tourism Expo in New Delhi, Hyderabad Fair, Darjeeling Tea Festival, International Fair at Udaipur, Investment Festival in Jaipur, Surajkund Craft Festival in Haryana, Kullu Festival in Himachal Pradesh etc. in the country. These two bodies also participated in international festival in Berlin in 1988 and 1999. It is premature to comment on the impact of such participation in terms of significant increase in the tourist inflow to the state.

34. Assam tourism had produced documentary films, colourful brochure, and stickers, besides creating a website assamtourism.com.development as a part of the publicity campaign.

8.6 Strategy For the Future

35. It is generally believed that tourists, both domestic and foreign, visit different places in search of specialities, which include a variety of things, such as, beauties of nature, architecture, peace of mind and fulfilment in religious places, new and different variety of food, culture of the people and uncommon adventure. In the midst of so many varieties, tourists make certain common demands, and these are (i) clean, hygienic and comfortable living accommodation; (ii) good transport system to take them from one place to another; (iii) decent shops particularly catering to ethnic art, clothes, artifacts, and (iv) entertainment representing cultural heritage of the place (Report of the Advisory Committee on Industries, Vol. I, Assam, 1996, p. 22).

36. The Annual Report of the Ministry of Tourism: 1999-2000 also states that tourists invariably seek "a pleasant and delectable experience on their trips". The most desired tourism product, the Report states, should consist of (a) an environment of peace and stability, (b) an assurance of safety and security, (c) an affable host society, (d) an industry and a government that provides the requisite service with a smile, (e) absence of extortion and hostility, and (f) accessible tourist attraction (p. 6).

37. Assam is richly endowed by nature to become a spotlight of tourism, but mere having a good number of attractive tourist spots is not enough unless all the minimum requirements stated above are not readily available.

38. The issue of promoting tourism, through which a major source of national revenue can be created and generated, cannot be handled in isolation. A multi-front strategy has to be developed to elevate it to the status of industry. The following points are advanced in this direction:

a. State policy for Tourism: A policy of tourism for the state of Assam has to be evolved on the line of National Policy of Tourism, which incorporates broad policy guidelines to attract both domestic and foreign tourists. The general principles recently announced by the Union Ministry of Tourism around four `S' should form the core of the policy of Assam tourism.

b. Fixation of Targets: Certain targets should be fixed in respect of tourist inflow, infra-structural development, commissioning of new projects, annual revenue to be earned and employment to be generated.

c. Publicity Drive: Information about tourism in Assam should be made available in the embassies in New Delhi and diplomatic offices in major Indian cities. Colour pictures of large size depicting the natural beauty of Assam and its rich culture should be displayed in the national and international airports and the basic information about places of tourist attraction and the facilities available should be kept in special corners in the airports. The website created by Assam tourism should be updated giving all the details of information on tourism. It is pertinent to mention that Assam has to market tourism aggressively. "One will have to go out and sell, instead of waiting for the customers to come and buy" in a market of stiff competition. (Assam Beyond 2000, p. 64). Information about tourism in Assam should be made widely available including one on the internet.

d. Infrastructure: All the infrastructure connected with tourism such as good road communication, good hotels and safari resorts, water sports, tents and other logistics for eco-tourism should be developed. In Guwahati there are a few good hotels. But in other places of tourist attraction there should be good hotels and safari resorts with decent living conditions, if not five-star hotel standard. It is reported in the media that hotels and restaurants have been earning significant revenue in recent years. This tertiary sector needs greater attention.

e. Facilities for the Tourists: Tourism is known as a 'hospitality service' and it should ensure all possible facilities (Suvidha) to the tourists, who are to be treated as honoured guests. Apart from infrastructure, tourist information, travel services and trained guides are needed in Assam. The Government of Assam should initiate a tourist guide-training programme for a limited number of youths and upgrade the tourist information centres.

f. Cultural programmes: There should be provision for musical entertainment to the tourists staying in the hotels and tourists bungalows in important tourist places like Kaziranga and Guwahati, so that the evenings become delightful and the tourist can be enriched by the cultural contours of the region.

g. Communication network: Although most of the tourist places are not very far from the airports, the condition of most of the roads including the national highways is not satisfactory. The approach roads to most of the tourist spots are in deplorable condition. Absence of good roads to the places of tourist attraction is a discouraging factor. Efforts should be made to coordinate with the PWD (Roads) to improve the condition of the approach roads to the tourist spots on priority basis. Secondly, each tourist spot should have at least a PCO for facilitating the tourists to maintain their contact with the rest of the world. In this connection, it may be noted that the river Brahmaputra offers a scope for an eco-friendly river transport. The Techno-Economic Feasibility Study (1998-99) sponsored by the Union Ministry of Tourism confirms the viability of such a venture. The massive volume of water can be properly used to take tourist from one place to another by luxury cruisers. For example tourists might like to choose the river route to travel from Guwahati to Tezpur by a luxury cruisers.

h. Coordination with various bodies and agencies: The Directorate of Tourism, the ATDC, Department of Archaeology, tea garden management and the civil aviation should strive for coordinated efforts to promote tourism. The Directorate of Tourism and the ATDC have mutual coordination and frequent meetings but they do not have proper coordination with other related organizations and bodies. This is serious matter, which should be addressed for the promotion of tourism in Assam.

i. Fiscal incentives: The Government may offer fiscal and other incentives to the private entrepreneurs to take up a host of tourist related services like setting up hotels and restaurants, to purchase vehicles etc. by making provisions for soft loan and reducing tax rates. It may encourage the local youths to set up tents with modern facilities and to make available other related equipment for water sports in areas selected for eco-tourism. In other words, transport, accommodation, and other logistics of tourism should be left to the private sectors making the way for a healthy of privatization of the tertiary sector associated with tourism.

j. Tourism package for the North East: Tourism in Assam cannot be viewed in isolation. Assam is the gateway to North-East, which, as stated already, itself is a reservoir of natural beauty with great variety. Many tourists visiting Assam would like to visit Shillong, Cherapunji in Meghalaya and a number of places in Arunachal Pradesh like Tawang, Bomdila, Tezu and Meo. There may be an integrated approach to promote tourism in the region with an attractive package of nature, eco, tea, adventure tourism. The Union Tourism Ministry has given 'special attention' to

develop an integrated approach to eco and adventure tourism. On the similar line and with the active support of the Ministry, the Department of Tourism in collaboration with the ATDC can chalk out a plan of action to develop eco-tourism along with adventure and tea tourism in the state. To that end also there is the need to have a regional approach involving all the states of the region. The North-Eastern Council should come up to play an integrated role in this regard. It will be easy to have coordination with Meghalaya, but it will be a difficult task to have coordination with Arunachal Pradesh where the inner line system is in operation.

In this connection it may be mentioned that the Annual Report of the Ministry of Tourism stipulated 25 travel circuits in the National Action Plan for Tourism, one of which is Guwahati-Kaziranga-Shillong-Tawang (p.3). The Ministry is preparing a master plan for the development of Bhalukpong-Tawang travel circuit. Such steps need an effective coordination among the states of the region.

k. Role the media: The media has been playing a significant role in recent years in promoting tourism. Most of the local newspapers are publishing articles and write ups giving coverage to the prospect of tourism in Assam, the places of tourist attraction with coloured photographs. But only a few national dailies have so far given coverage to tourism in Assam. The Directorate of Tourism and the ATDC should take steps even by purchasing space in the national dailies focusing on the attractive places of Assam at least once in a year just before the onset of the peak period of tourism in the state.

l. Spring festival: The Department of Tourism and ATDC may organize spring festival on the line of the desert festival in Rajasthan in the historic town of Sibsagar on the courtyard of the Rangghar. This is in addition to what is at present being done in Sankardev Kalakhtra, Guwahati. The festival should be made enchanting with the presentation of songs and dances of the region, enjoyable with various dishes, and colourful with the display of various folk dresses and handicrafts. Conducted tours can be arranged from Sibsagar during that time to Dibru-Saikhowa and Digboi, both are important places of tourist attraction. The project to commission sound and light programme in front of historically important buildings in Sibsagar narrating the history of the Ahom rule covering so many events and stories of love and sacrifice can be very attractive to both domestic and foreign tourists.

m. Role of the government: The development of the human, social and economic condition of a state improves greatly where there is effective and pro-people governance. The presence of the government must be felt in the positive sense and within the framework of a welfare state. There may be policies of high order, there may be strategies of unassailable quality, but if there is no good governance, goals set cannot be achieved. In respect of Assam a couple of pertinent points be highlighted:

- The problem of insurgency and violent political movements, which stands as the stumbling block to the development of Assam, has to be resolved at the earliest. The security scenario has to be improved to make Assam absolutely safe for all tourists. Similarly, the national park of Manas should be once again made safe for them.
- The Government of Assam has to market tourism through the ATDC.
- The tourism policy of 1987 has to be made known to the people along with the steps taken towards its implementation. People's involvement in tourism should be sought by offering incentives to them to venture wayside amenities. This may produce good results.
- Effective methodology has to be evolved and implemented to forge coordination of various departments and organizations directly and indirectly associated with tourism.
- With the upgradation of the airport in Guwahati to international standard the prospect of foreign tourists visiting the region has become brighter than before. The task of ensuring good sanitary condition around the tourist spots and the improvement of the condition of the railway and bus stations nearby the tourist spots should be urgently taken up.
- The central assistance to upgrade facilities and infra-structural development should be tapped and properly utilized. The Central allocation of assistance to the state in this regard during financial year of 1998-99 was Rs 13.76 crore and out this Rs 4.6 crore was released. It is imperative to have an effective monitoring system, so that the projects sponsored by the government are implemented on time and in right earnest. This can be accomplished only when there is transparency and vigilance.
- While promoting tourism utmost care should be taken to restrain it from degenerating into "mass tourism" which carries a host of evils capable of destabilizing the society. In this regard the 'correct approach' adopted by the Government of Sikkim may be followed.

Appendix A: List of Persons Contacted

The team from Indira Gandhi Institute of Development Research had the benefit of discussion with a number of people. We thank them for their time and suggestions The list of people with whom we had discussions is as follows:

A Basu, Director Planning, Irrigation

A K Bhagwati, Director, Fisheries Research Centre

A K Bora, Professor, Tea Husbandry & Technology Department

A K Pathak, Director of Research (Agriculture)

A K Sarma, ACE (HQ)

A K Sarma, ACE(H Q)

A K Sinha, Head, Nematology Department

A N Borah - Joint Secretary, Handloom & Textile

B Baruah, Professor, Agricultural Economics, Department

B M Das, Joint Director, Eco & State

B N Sarmah, Head, Agronomy Department

D Phukan, President, All Assam SSI Assocn

D M Singh, Director, Wildlife, Kaziranga National Park and other Senior Officials of Forest Department of Golaghat and Jorhat District

F Ali, Deputy Director, Sericulture

G C Gogoi, CE (GNM)

G C Medhi - Under Secretary,

G C Pathak, SE (RC), ASEB

G L Kaul, Vice Chancellor

H K Mohan, Joint Director, Sericulture

H N Kakati - Director, A H & Vety

H P K Singh, Additional Director, P&D

H S Das, IAS, Commr & Secretary , P&D Deptt

H Sonawal, IAS, Commr & Secretary , Health

J Baruah, IAS, MD, AIDC

J C Goswami - Joint Secretary, Border Area Deptt

K Baruah, CA, ASEB

K K Barua, Head, Plant Physiology Department

K K Hazarika, IAS, Member

K K Mittal, IAS, Commr , P&R D

K K Nath, Head, Agro-Meteorology Department

L Rynzah, IAS, Principle Secretary & Commr & Secretary , Agriculture

M K Sarma, Director, FINER

Md Hasan Ali - Secretary, S W Deptt

N C Dhekialphukan, Director, Economics & Statistics

N G Barooah, IAS, Secretary , P&D

N K Bora - Secretary, PWD

N K Das, CE (DISTRIB), ASEB

N Kakati - S E (PHE)

N M Hussain - Director, Handloom & Textile

P Barthakur, IAS, Director, Industries

P Basumatary, Member, ASEB

P C Deka, Dean, Faculty of Agriculture

P C Gohain, Director, Border Area

P K Baruah - Under Secy , Flood Comtrol

P K Bordoloi, Director of Extension Education

P K Dutta, Director of Physical Plant Dr

P K Goswami, Senior Manager(PM&C) N R L

P Neog, Secretary, Irrigation

P Saikia - Joint Secretary, P & D Deptt

Pranab Kumar Bora, IAS, Chief Secretary

R Baruah, Head, Biochemistry Department

S Ali, Joint Secretary , Power

S Ali, Joint Secretary, Power

S C Das, IAS, Commr & Secretary , Industries

S C Longmailai - Joint Secretary , Social Welfare

S Das, Manager, Power Grid Corporation

S Jerath, IAS, Commr & Secretary , Power

S K Saha, Deputy CAO, ASEB

S P Dutta, Director, P & D

T C Baruah, Head, Soil Sciences Department

T C Brahma, Head, Animal Husbandry Department

T N Barpujari - Jointt Director, Fishery

T N Saikia, In-Charge, Agro-Economic Research Centre

Z M Haque, Deputy Secretary , Power

Z M Haque, Deputy Secretary , Power

Persons interviewed in various places for Chapter 6 on Connectivity on the Brahmaputra.

In Delhi

B B Basu, Faculty member, IDSA

Bindaswary Pathak, Chairman, Sulabh International Dr

K L Thapar, Director , Asian Institute of Transport Development

K L Thukral, Senior Consultant, Asian Institute of Transport Development

P K Jha, Vice Chairman, Sulabh International Dr

R K Jain, IRTS, (Executive Director Perspective Planning), Railway Broad, Ministry Of Railways

R M Nair, Member (Technical), IWAI

R P Khare, Dy. Director. IWAI, Government of India

In Kolkota/Haldia

A K Sinharay, Chief Manager (RSD), CIWTC Ltd

Aditya Banka, Director, ODC Carriers Pvt Ltd

D K Sinha, (Assistant Manager, Finance), CIWTC Ltd

H P Barooah , President , North-East Chamber of Commerce and Industry

P Dasgupta, Secretary, Bengal Chamber of Commerce and Industry

S K Mandal , Assistant Director (Planning and Research), Calcutta Port Trust

S N Chakrabartty, Deputy Director (P&R), Calcutta Port Trust

Siddhartha Banerjee, Manager (I&CF), Calcutta Port Trust

At Guwahati

Dinesh Chandra Sarma, Sr. Commercial Manager, NF Railway.

Dulal Goswami, Department of Environmental Science, Gauhati University Prof

G.P. Singh, Executive Engineer, Brahmaputra Board

Himanshu Das, IAS, Development Commissioner, Government of Assam

Karuna Choudhary, General Manager , Brahmaputra Board

M K Saha, Deputy Director, IWAI

M K Saha, Divisional Manager , CIWTC Ltd

Pranab Bora, IAS. Chief Secretary, Government of Assam

R. Majumdar, Executive Engineer (Commercial), Assam State Inland Water Transport Corporation

Utpalprana Hazarika, CPRO, NF Railway Ms

At Jorhat

Gasnabi, Hydrologist Divisional Executive Engineer, Flood Control Department Prof

Nara Bora, Ex. Executive Engineer Flood Control Department

O P Gattani, President, Jorhat Chamber Of Commerce

Ravi S Prasad, IAS, Deputy Commissioner, Jorhat.

A total of 56 persons were interviewed at Neamatighat, including daily passengers, boat men, residents of the ghat and daily wage labourers.

At Dibrugarh

Divisional Executive Engineer, ASIWT Corporation

Divisional Executive Engineer, Flood Control Department

Manoj Jalan, MD, Jalan Industries

Mukti Gogoi, ADC, Dibrugarh

A total of 41 persons were interviewed at Dibrugarh ghat; they included daily passengers, boat men , residents of the ghat and daily wage labourers.

Appendix B: Brief History of Assam

Assam is one of the medium-sized states of the country with an area of 78,500 sq km and a population of 2.66 crore. 'Assam' is the anglicized form of the word 'Asom' which means 'uneven' or 'unparalleled'. According to another interpretation, the word 'Assam' is derived from the word 'Ahom', the Tai Mongoloid race who ruled most of the Brahmaputra valley for over 600 years till the coming of the British in 1826.

Assam's is essentially a river valley civilization. Going back into history, one finds Assam to be an ancient land that figured prominently in international trade even before the birth of Jesus Christ. Chang Kien, a Chinese explorer, had traced his country's trade with Assam as far back as in 100 BC. According to the Periplus of the Erythrean Sea, Himalayan malabathrum and silk from Assam had reached Egypt and Rome in pre-Christian times. Assam also figured prominently in Ptolemy's geography (2nd Century AD).

Human footprints in this land have been traced back to the early Stone Age. The earliest footprints were those of Austric aborigines who were followed by the pre-Dravidians. When opened, the eastern migration routes witnessed the arrival in quick succession of several Mongoloid groups of people who came to populate the land almost totally by the time of the Vedas. Most of the present tribal groups of the North-Eastern region are offsprings of those Mongoloids, whom the vedas referred to as the Kiratas.

Absence of sufficient archaeological materials has made exploration of Assam's past a difficult task. However, from the two epics and other ancient literature, we know that the ancient name of Assam was Pragjyotisha, with present-day Guwahati being known as Pragjyotishpura, the city of Eastern Lights. Pragjyotisha, subsequently known as Kamrupa, had then covered a much larger territory, at times extending as far as the border of Nepal. The Kalika Purana and Vishnu Purana have confirmed that the extent of Kamrupa's territory was about 450 miles in all directions from the Kamakhya temple, located atop the Neelachal hills in Guwahati.

The ancient kingdom of Kamrupa comprised roughly the Brahmaputra Valley, Bhutan, Rungpore and Coochbehar. While the northern and eastern limits of the kingdom were the Himalayas and the Patkai ranges, its western limits were defined by Karatoya river, which rises in the extreme north-west of Jalpaiguri (in present-day West Bengal). This river separated Bengal from Kamrupa. This western limit has been defined in the 'Yogini-tantra'.

The Ramayana and Mahabharata as also Kalidasa's Raghuvansa made pointed reference of this region as Kamrupa-Pragjyotisha. King Bhagadutta, son of the Pragjyotisha-Kamrupa King Naraka, fought at the head of a large army of Kiratas in the battle of Kurukshetra on the side of the Kauravas, while Ghatotkacha, son of Bhima by the queen of the ancient Hirimba (Kachari) kingdom in Assam showed great prowess in that battle on the side of the Pandavas.

It is commonly accepted that the earliest rulers of Pragjyotisha belonged to the Danava dynasty, the most important of the line being Mahiranga Danava. The most popular and colourful figure in the legends of this body of tradition is King Narakasura, founder of the Bhauma Naraka line, whose birth is ascribed to the union of Vasumati (Mother Earth) with Vishnu in his Varaha incarnation. Naraka's descendant Bhagadutta finds honourable mention in the Mahabharata. Ancient Kamrupa had many contacts with other Indian kingdoms. Kalhana's Raja-tarangini mentions of the marriage of Kamrupa princess Amritaprabha to Meghavahana, the king of Kashmir. She was his chief queen and a prominent figure in Kashmir history.

Hiuen Tsang, the famous Chinese traveller, gives a detailed account of Assam of the seventh century, when King Bhaskaravarman enhanced the power and prestige of Kamrupa to an extent never achieved before. Bhaskaravarman was a close friend and ally of Emperor Harshavardhana and his kingdom covered almost the whole of eastern India and enjoyed great prosperity.

The Varmans were followed by the rulers of the Salastambha dynasty who held power till the end of the 10th century AD. Among the important kings of this dynasty were Harshadeva or Shri Harsha, who even assumed the title of Maharajadhiraja Parameswara Paramabhattaraka. The most powerful and prominent monarch of this dynasty, however, was Vanamala Varmadeva, whose kingdom extended far and wide and included present-day North Bengal.

Then came the Pala dynasty, set up by Brahmapala, which flourished till the beginning of the 12th century. Another important ruler of this region after the Pala kings was Prithu, who had successfully resisted the first Muslim invasion of Kamarupa, led by Mohammed Ibn Bakhtiyar and completely annihilated the Muslim forces. A second Muslim onslaught however was successful and Prithu was overthrown in 1228.

Around the same time, the Ahoms, a Tai-Mongoloid group, migrated to Assam from around present-day Yunan Province of China. Siu-ka-pha was the first Ahom king in Assam. The Ahoms were given stiff resistance by the Kacharis who dominated eastern Assam. But slowly and steadily, through a policy of conciliation and assimilation and military might, the Ahoms consolidated and expanded their position in the Brahmaputra valley.

In the 16th century, the Koch kingdom attained great heights in western Assam and present-day North Bengal. Naranarayan, who is believed to have reigned from 1533-1587 AD, was the greatest among the Koch kings. His brother, General Chilarai, was a great conqueror and led successful expeditions against the Kacharis, Khasis, Garos, Jayantias, Syhlet, Manipur, Tripura, Mymensing, Demoria and the Ahoms. In 1563 AD, Chilarai and Naranarayana entered Gargaon, capital city of the Ahoms, after a military victory. Soon thereafter, they entered into a peace treaty with the Ahoms and returned to Coochbehar.

After Naranarayan and Chilarai, the Koch power declined and the Koch territory slowly came under the control of the Mughals. The Mughals made repeated attempts to conquer Assam but without success. The Ahoms were remarkably successful in resisting the Mughals. However, in 1661, Mirjumla was deputed by Aurangzeb to conquer Assam.

In December 1661, Mirjumla conquered Coochbehar. In March 1662, Mirjumla entered the Ahom capital Gargaon. The Ahom king Jayadhwaj Singha retreated to the hills near Namrup. But Mirjumla's victory was short-lived. The floods, pestilence and relentless harassment from the guerilla attacks of the Ahom soldiers compelled Mirjumla to sign a peace treaty (the Treaty of Ghilajharighat, January, 1663) with the Ahom king. On his way back to Dhaka, Mirjumla died in March 1663. The terms of the treaty between the Mughals and the Ahoms tilted heavily in favour of the Mughals. Chakradhwaj Singha succeeded the Ahom king, Jayadhwaj Singha, in 1663. Being highly sensitive to his prestige and dignity, the new king resolved to free the country from the burden of the heavy indemnity payable annually to the Mughal Emperor. He raised a new army and prepared to attack the Mughals and drive them away from Assam. Lachit Barphukan was placed at the head of the new army.

Guwahati, which came under the Mughals after Mirjumla's success, was won back by Lachit Barphukan in 1667. The Commander of the Mughal garrison in Guwahti, Syed Feroze Khan, was taken prisoner. The battle royal between the Mughal and the Ahoms were fought at Saraighat near Guwahati in 1671. The Mughal army led by Raja Ram Singh of Amber was decisively defeated by Lachit Barphukan in a naval battle. Ram Singh's second-in-command Rashid Khan and many Mughal soldiers died in the battle. Thereafter, the Mughals could never launch any further effective expeditions against the Ahoms. Rather, it was the great Ahom king Rudra Singha (1696-1714) who was about to invade the Mughal empire in 1714 before his premature death.

Slowly, Ahom power also started declining in the second half of the 18th century. There was internal dissensions and civil war. Most important among them was the Moamoria rebellion during the 1770s and 1780s. In 1818, the Burmese invaded Assam and forced the Ahom king to leave the country. Finally, in 1826 the British intervened and drove out the Burmese from Assam. Assam came under British domination after the treaty of Yandaboo between the Burmese and the British company in 1826.

Except for the brief period from 1663 to 1667, after Mirjumla's successful expedition and from 1818 to 1826 during the Burmese incursion, Assam always remained unconquered by any outside power. Disenchantment against the British also started soon after 1826. Piyoli Phukan was hanged in 1830 after his unsuccessful armed rebellion against the British. The Sepoy Mutiny of 1857 had its violent manifestation in Assam also. Maniram Dewan and Piyoli Barua, two Assamese nobles, were hanged after the Mutiny was suppressed.

From about 1857 till 1947, Assam had a period of peace and economic regeneration under the British regime. Tea, oil and timber-based industries were set up in Assam during this period. The railway infrastructure was also laid by the British. But the Assamese craving for freedom from foreign domination never subsided. Assam took active part in the freedom struggle. Gopinath Bordoloi, Tarun Ram Phukan, Nabin Chandra Bordoloi, Ambikagiri Roychoudhury, Kuladhar Chaliha and many other prominent freedom fighters from Assam made significant contributions

to the freedom struggle. Gopinath Bordoloi was awarded Bharat Ratna posthumously mainly for his role in the freedom movement and for his contributions to national integration.

Culturally, Assam has been a melting pot. Over the centuries various migrant groups entered Assam from the neighbouring countries including China, Myanmar and South-east Asia. Most of the migrants were Mongoloids. From the West, Aryan influence also entered Assam. Till the advent of the 16th century, Assam was the seat of hardcore Tantrik practices. The Vaishnavite saint Srimanta Sankaradeva (1449-1568) brought in radical transformation in Assamese society. His reforms movement was in a way part of the larger Pan-Indian Bhakti movement. He introduced a monotheistic faith cutting across castes, creed and religion. His first few disciples included Muslims, tribals and lower castes as well as Brahmins. Sankaradeva engineered a complete social, cultural and literary rejuvenation of the Assamese society. His work was carried on by his successors who included, among others, Mahapurusha Madhabdeva, Gopaldeva, Damodardeva and Harideva. The influence of Srimanta Sankaradeva and his successors are the predominant distinctive mark of the composite cultural mosaic of Assam even today.

Historically, Assam has been a prosperous land. But today, Assam is one of the poorest and the most problem-ridden states of the country. Natural calamities, mainly floods, insurgency, terrorism, ethnic tension, economic backwardness and poverty, massive unemployment, serious financial crisis and many such problems have tormented the state for quite some time. At the time of Independence, Assam was one of the richer states and its per capita income was 4 per cent above the national average. Today, Assam ranks among one of the poorest states of the country and its per capita income is less than 60 per cent of the national average. What is even more disturbing is that the gap between Assam and rest of the country in terms of per capita income has been widening continuously during the last flfty years and if the present trend continues, then by 2020 the per capita income of Assam will be only about 40 per cent of the national average.

Assam and the North-East became the scene of massive war-time activities by the Allied Forces during the later part of the Second World War. The advance of the Japanese Army towards India was halted in the battle of Nagaland and Manipur. This was the turning point of the Second World War in its eastern theatre. That also meant a setback to Netaji Subhas Chandra Bose's Indian National Army's bid to liberate India, beginning with its eastern frontiers, from British rule. During the war, Assam became a main supply corridor of the Allied Forces. The Stillwell road (named after General Joseph W. Stillwell) connecting Ledo, the easternmost railhead in Assam, with Kunming in China (Yunan province), covering a distance of 1079 miles, was completed in record time. This road became a vital supply link for the allied forces in China, bypassing mainland Burma (Myanmar) which was then under Japanese occupation. Many air-bases were also built in Assam to facilitate aerial supply. Large-scale troop movements took place through Assam. The Second World War left its marks on the social, economic and political life of Assam. In fact, it were the huge quantities of arms and ammunitions left behind by the Japanese and the Allied Forces with which the first generation underground Naga nationalists

began their militant activities in the 1950s when Nagaland was a district of Assam. This was the beginning of insurgency in the North-East.

But Assam's tale of woes actually began with the Partition of the country. The problem of transport bottleneck and geographical isolation started in 1947. Road and railway transit routes through erstwhile East Bengal were lost. So also the traditional trade relations between Assam and the neighbouring countries were strained. 1947 also meant large-scale migration of refugees from East Pakistan to Assam and the beginning of ethnic conflicts in the state. Then came the great earthquake of 1950, which was one of the 10 biggest earthquakes ever recorded in the world. It changed the topography of the region and the courses of the river Brahmaputra and some of its major tributaries.

The earthquake was followed by severe floods in the mid-1950s bringing untold devastations and miseries in their trail. Next came India's war with China in 1962. Assam and the North-East faced the brunt of the war. It was a big psychological blow to the people of the North-East and it sent a strong signal to prospective investors that Assam is not a safe place for investment. The 1962 war also perhaps changed the perspective of the national policy makers vis-a-vis Assam from development to defence. Soon thereafter the Indo-Pak war of 1965 broke out. Once again Assam had to go through the trauma of the war. The riverine route from Assam to the outside world through the then East Pakistan were sealed as a result of the war. The next severe blow came in 1971 when Assam not only had to suffer the war-time tension and inconveniences of the Bangladesh liberation war but also had to give shelter to millions of refugees from erstwhile East-Pakistan for more than a year.

In 1971, Assam was fragmented once again and Balkanisation of the North-East was taken one step further. Assam had to shift its capital in 1974 from Shillong to Guwahati. Before the administration could settle down in its new environment in a make-shift temporary capital, the Assam agitation began in 1979 and the administration was stressed to its limits. Maintenance of law and order got precedence over everything else. The agitation was over in 1985 after the signing of the Assam Accord. But the respite was short-lived. The rise of the ULFA in the mid-1980s followed by unrest in Bodo areas engulfed the state with militancy, insurgency, terrorism, and associated killings, extortions. Although the state is very rich in natural resources and industrial raw materials, the process of industrialization of the state came to a grinding halt. Not only did the flow of fresh investment stop, there began a process of capital flight from the state.

The situation has been further compounded by involvement of some external forces inimical to India and their attempt to fish in the troubled waters of the North-East. It has now been established that many of the insurgent outfits of the North-East receive arms training and other logistic supports from the near abroad. During the last five years, from 1996 to 2000, 1889 persons were killed in terrorist-related violence, of which 413 were security personnel. In fact, during the last 20 years, the state government has hardly got any respite to take any strong development initiative. It has been completely engaged in fighting, with its back to the wall, the

problems of insurgency and terrorism, ethnic uprising and violent clashes and natural calamities, mainly floods. Apart from the direct cost of flghting terrorism including loss of life and property, the indirect cost in terms of loss of production, employment, investment and a general environment of insecurity and despondency, have been immense. Assam's case of economic degeneration cannot be explained in its entirety by economic logic and theory. It must be seen in its proper historical, cultural, political and geographical perspectives.