

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 financial 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 region¹.

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

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 (NABARD/SNEDFI: 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

Year	Road Length ('000 Km)			Road Density (Km per '000 Sq Km)		
	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

- 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.
- 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. Baithalangsuh-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
S P Shukla Commission (March 1997)	5. A rail-cum-road bridge at Bogibil near Dibrugarh	5. Final location survey completed. Final clearance is awaited.
	6. Expeditious completion of Bogibeel bridge	6. Final clearance awaited
	7. (a) Diphu-Karang and (b) Bairabi-Saireng lines be taken up in 9 th 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.
Jain Committee	10. Linkage with Myanmar.	10. No proposal.
	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 fleet 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 significant 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, Various Issues

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

- 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 – 9 th 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 than 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 disbursement 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 31 st 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-tracking 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 economy².

- 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.

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 exercise³ 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 carved 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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