CHAPTER 5

RAILWAYS AND INDUSTRY

The impact of railways on Assam's industrial sector can be analysed at the outset by examining to what extent railways have created a favourable climate for economic activities. Before the independence, even in the middle of the nineteenth century, Assam was a type of enclave economy, and few backward and forward linkage effects were experienced when the railway construction and transportation started in the last part of the last century. Primary products predominated the list of exports and the benefits of new railway development did not spread to the economy evenly amongst various regions of the State.

Facilitating Role - Specific to Tea Industry

Contrary to the general belief that transport aided industry we find that it was industry (mainly tea plantation) that provided an impetus to the development of transport in Assam during the nineteenth century. Assam economy is an illustration to the fact that it is not only the growth of industry which depends upon transport innovation but the type and growth of transport system also depends on the expectation of industrial development and potentialities. Even in the non-rail or pre-rail economy of Assam the tea industry showed great promise of growth as is evident from the Table 5.1.
Table 5.1: Number of Tea Factories in Assam Up to the end of 1859 (November)

<table>
<thead>
<tr>
<th>Division</th>
<th>Number of Factories</th>
<th>Total area (acres)</th>
<th>Outturn in 1858-59 (lbs.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seebsagur</td>
<td>16</td>
<td>4,778</td>
<td>693,249</td>
<td>Belong to Assam Company</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>90,180</td>
<td>153,000</td>
<td>Belong to Private planters</td>
</tr>
<tr>
<td>Nowgong</td>
<td>14</td>
<td>11,034</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Luckimpore</td>
<td>10</td>
<td>14,038</td>
<td>282,000</td>
<td></td>
</tr>
<tr>
<td>Kamroop</td>
<td>10</td>
<td>12,207</td>
<td>6,160</td>
<td></td>
</tr>
<tr>
<td>Durrung</td>
<td>3</td>
<td>3,783</td>
<td>23,280</td>
<td></td>
</tr>
</tbody>
</table>

In 1862 tea production in Assam rose to 1.2 million lbs. In Assam the number of tea gardens increased from 1 in 1850 to 295 in 1871 and the area under cultivation rose from 1,876 acres to about 31,000 acres; the output increased from about 0.02 million lbs. to over 6.2 million lbs. during the same period. And it is interesting to note that by 1873-74 almost every large tea garden in Jorhat area had a leaf-rolling machine worked by steam. Even by 1878 there were no less than 60 gardens along the Sadiya road alone in the north-east Assam, employing 20,000 imported coolies, for whom 1.5 lakh maunds of rice had to be imported annually, while the weight of tea exported was 60,000 maunds. By 1880 when the railway line had not yet touched the soil of Assam, the area under tea cultivation surpassed all other regions of India.

Tea formed about 70 per cent of the total value of the whole export trade of Assam and the steamer alone could export not less than about 3 lakh maunds a year. The total area of tea under cultivation in

1 G.O.I.: Annals of Indian Administration: volume V: 1861, p.448
the Brahmaputra Valley was much more than that in Cachar and Sylhet or in Bengal. In fact, it is interesting to note that even in the non-rail economy of Assam (in 1880) as many as 763 tea gardens sprang up with a total outturn of about 21.4 million lbs. a year. The Sibsagar district had the highest number of gardens despite absence of railways.

In fact in the nineteenth century tea industry grew up in Assam mainly because of natural advantages and railways were not important as a initiating factor. The railways were not required to create a state of expectation or a climate for investment in tea plantation. On the contrary, it appears that the existence of tea industry was the main cause of improvement of communications. During the last part of the nineteenth century tea industry was urgently looking for a suitable mode of transport for touching potential markets.

"In 1900 the Chairman of the Indian Tea Association concluded that the most urgent task for the industry was to expand the out-markets and he considered it unsatisfactory that out of a crop of something over 174 million lb: only about 30 million lb should find its way to markets outside the United Kingdom". 4

However, railways' facilitating role is clear when we see the rate of growth of area under tea after 1882, when the first railway line was constructed. In 1875-76 the area under tea in Assam was 39,864 acres, in 1882 it rose to 108,673 acres and by 1901 the area increased to 204,682 acres. The corresponding figures of total outturn were 12.6 million lbs, 28 million lbs and 72.3 million lbs.

6 In 1891 the total production of tea in North India reached over 119 million lbs made up as follows: Assam Valley 49.5, Cachar and Sylhet 37, Darjeeling and the Dooars 22.5, Chittagong and Chota Nagpur 1.5, Dehra Dun, the Kumaon, and Kangra 4.5, private and native gardens 4 million lbs. South India was producing only about 4 million lbs. (Griffiths, P.: Ibid., 1967, p.127)
By 1913 the acreage under tea in Assam rose to 367,500.

It cannot be denied that after the first railway line was constructed the fall in transport cost, economy of time and assurances of regular flow created a state of expectation for industries. Not only investment opportunities were created, the degree of uncertainty and entrepreneurial risk tended to decline and scope for decision-making increased once the railways appeared in the vast undeveloped areas of the east.

The next important impact was that when the railways were built, to a great extent, in response to the demands of plantation industry they were supposed to create through dynamic interrelations of the industrial system still other economic needs. As a result of railways' own needs two types of events were to follow: first, the creation of ancillary industries or the creation of new capacity for manufacturing many items (of store) required by the railways themselves; secondly, the expansion of existing industries to optimum levels that would permit significant economies of scale through improved technology. So far as the first effect was concerned it was limited by the constraint that the derived demand brought about by the railways was not fed by the indigenous manufactures. Moreover, the initial growth of railways in Assam was restricted to such a narrow area in the eastern-most corner that the western and the central Assam did not feel the impact of new transportation innovation for many years. The railway investment in 1882 could not be classified as social overhead investment as the investment was very much specific to the needs of tea industry.

7 Griffiths, P.: Op.Cit., pp.120-144
8 When the (A.B.) railway line was opened for traffic from Chittagong as far as Silchar by 1899 it passed near many tea gardens and carried a considerable portion of the tea crop of the Sylhet district. (Allen, B.C.: Assam District Gazetteer 1905, volume II, Sylhet)
Growth of Various Industries

However, the first railway line formed an essential basis for small-scale private investments in miscellaneous industries in the restricted region where it served. Since the inception of the railways in 1882, the bulk of the development along the line from Makum Junction to its eastern terminus, the collieries, saw-mills, brickworks, oil-field, in addition to Makum and Namdang tea estates, had been started by the A.R. & T Company. At the time of the First World War, approximately half of the region traversed by this thirty miles of railway line, from Digboi to Makum Junction, was undeveloped and extremely backward. The construction of railways by the A.R. & T Company and the growth of collieries created a great demand for bricks. Before 1890 bricks were made by hand and burnt in clamp kilns. By 1890 the brickworks had been established at Ledo and was producing machine-made bricks fired in a Bull's kiln. There was similar effect on timber and ply-wood industry also when large quantities of materials were needed for railway bridge (over the Dehing river). The need for more tea chests and timber gave birth to saw-mills in those areas. However, the backward linkages, resulting from the supplying of rolling stock and timber and ply-wood, had their effects in regions outside the economy of Assam. By 1906-07 three-ply chests worth Rs.23 lakhs a year were imported into India, and in 1924-25 the value of

9 A very important fact not duly emphasised elsewhere is that the oil industry is the child of the first railway enterprise. It was the engineers of the A.R. & T Company who noticed oil near their camps while constructing the railway line from Dibrugarh to Ledo in 1882. In fact, it is this Company which erected next year the first small refinery at Margherita to deal with the oil find at Makum.

these imports went up to Rs. 90 lakhs a year. On the contrary, in 1938-39 the number of tea chests produced was about 61 lakhs and in 1956 it rose to about 20 lakhs.

In fact, the development of Assam or otherwise in response to railway construction, was inevitably linked with the effect on the economy of the dominant country that was Britain. The locomotives to the E.B. Railway and the A.R. & T. Company came from the Baldwin Locomotive Works of the United States of America and not from within the economy. The railway building had little 'spread effect' as permission to buy government stores in India came only in 1928 and preference for local manufacturers in 1931. The recommendations of the Famine Enquiry Commission (1880) to encourage industry and sponsor technical training officially were ignored for nearly forty years.

In 1929, the Government of Assam described the conditions of industry in Assam as follows :

"Assam is not an industrial province. It is an agricultural province with no large towns or industrial centres. Its largest and most important industry, tea cultivation, is mainly agricultural. Apart from the tea industry, the only large labour concerns are the coal mines and oil fields and a match factory. There are a few scattered saw mills, rice mills, oil mills, engineering workshops and printing presses, but they are small and of little importance in this province. Secondly, as an agricultural province with land still available for settlement and no pressure of population, Assam has


It is interesting to note here that an approach in 1926 from the Assam Saw Mills and Timber Company Limited, asking that tea industry in North-east India should buy more of the Company's tea chests and that there should be a remission of the export duty on tea packed in Indian-made boxes, did not receive the support of the Indian tea industry. (Griffiths, P.: Op.Cit., p.185)

12 Information collected from Publications of the G.O.A.


14 It has been opined that although many railway companies had their officers and headquarters in London, they were subject to the ultimate control of the then Government of India on capital expenditure, and so might have been 'coerced' into buying in India. (Lehmann, F.: Great Britain and the Supply of Railway Locomotives in the Indian Economic and Social History Review, October 1965, p.298)
practically no indigenous industrial classes. There is, of course, some indigenous casual labour, both skilled and unskilled, in the small towns and villages to meet the ordinary needs of the people, viz., agricultural labourers, porters, carpenters, blacksmiths etc., but for the industries of importance labour has to be imported from other parts of India. The main difficulty which industry in Assam has to face is labour supply, and the labour employed is a heterogenous mixture of races and creeds drawn from almost every part of India". 15

It was in 1928 that an important industry (Sleeper Treating Plant) grew up in Naharkatia in the Upper Assam which could cater to the needs of the railways. The Sleeper Treating Plant treats raw sleepers with creosote oil to make them serviceable for permanent way. In 1970-71 this plant treated about 1.7 lakh broad gauge and 1.6 lakh metre gauge sleepers which were despatched to different railways as per their demand in addition to the local demand of the Railway.

During 1970-71 the Railway in Assam purchased about 4 lakh pieces of sleepers from Assam forests in addition to about 13 lakh cubic feet for bridges and other works. The supply of sleepers from the undeveloped areas of N.E.F.A. (now Arunachal) also increased to more than 1.5 lakh pieces a year. In addition to the Naharkatia Plant, there are two saw mills at Mendipathar, Garo Hills which have been supplying about 2 lakh cubic feet of railway sleepers per year.

However, these factories may close down their production owing to uneconomic exploitation of logs resulting from transportation difficulties. Apart from these enterprises, the A.R. & T. Company also produced treated sleepers for railways.

Mention may also be made of an enterprise of engineering industry such as the Steelsworth Private Limited which started manufacturing tea garden machinery. Thus, we find that it was tea which attracted railways and railways, in turn, led to expansion of tea industry and birth of certain ancillary industries.

Although the first railway workshop was established in 1881 by A.R. & T. Company at Dibrugarh, the later growth of engineering industry mainly concerned with railway repairs was a phenomenon to be seen not only in Assam but in the whole of India. It was only by 1931 that railway workshops in India employed about 1.25 lakh persons and other metal engineering workshops some 79,000. In 1903 there were only 70 engineering works in India employing 52,000 men.

It is significant to note that apart from doing its own work, the pioneer workshop (the Dibrugarh workshop of the D.S. Railway) used to help tea industry by repairing garden machinery during the idle period of about six months in a year when it had no sufficient work. This workshop was taken over by the State in 1945.

It was only after 1947, when the major railway workshop went to Pakistan, that measures were taken in Assam to manufacture various items directly demanded by the railway system. The Dibrugarh workshop continued to expand and by 1970 the total number of employees stood at 2,460 and total wage bill amounted to about Rs. 5.5 lakh a year. Its main activities are repair and overhauling, production of parts and components and repair of out-station components (namely, wheels, cranes, pumps etc. received from different places). This workshop has been stated to be almost sufficient for periodical overhauling for the Railway in Assam as it attained the capacity of repairing and overhauling 8 locos, 50 coaches and 150 wagons per month. Apart from this conventional outturn, the workshop has a large foundry which

17 It was in Japan that railways "quickly" stimulated the development of the home industry.
18 Anstey, Vera: The Economic Development of India (1939), p.255

(Under the Reforms Act, 1919, industry became Provincial subject while fiscal, tariff, transport, and general economic policy remained with the Centre. And an early attempt at locomotive production foundered when the Government and the Railway Board decided to continue their patronage of British manufactures after the First World War. Kidron, M.: Foreign Investment in India, 1965, p.15)
produces over 100 tonnes of ferrous castings and 25 tonnes of non-
ferrous castings per month. In 1962 this workshop introduced "payments
to workmen by results". By 1971 this scheme covered 1,149 employees.
As a result of this scheme the bonus earnings of the staff have
increased from about Rs.24,000 in January 1967 to about Rs.42,000 in
January 1970. This is an indication of increased productivity in the
workshop, and with this the net savings may be about Rs.10 lakhs per
year.

The bigger workshop, established in April 1965 at New
Bongaigaon at a cost of Rs.6.84 crores, is capable of overhauling
125 units of coaching stock and 250 units of wagon every month in
addition to repairing of wheels and springs. By 1971 about two-thirds
of its employees (761 persons) were covered by the incentive scheme
(as in the Dibrugarh workshop) which was introduced in 1966. Moreover,
one diesel locomotive shed has been established at New Gauhati after
1947. These workshops have contributed in no small way in developing

19 This is an innovation under which a worker is given 33\% per cent of bonus over and above his normal pay if he completes a
standard task within three-fourth of the scheduled time.

20 A good example of effect of railway workshops on industrial
development has been noticed in Rajasthan. As in case of Assam industry
in Rajasthan is relatively less developed and the industrial development in Rajasthan has been very uneven. The importance of some districts
is mainly due to the location of textile factories or railway workshop.
The location of railway loco and carriage workshops at Ajmer led to
the setting up of a few other industries in the city. Jodhpur has a
big railway workshop and in a real sense, Jaipur is the only important
industrial town which has a number of industrial units (engineering
industries) of various types. In Rajasthan, out of 26 districts, nine
districts did not have a single large-scale factory. Railway require-
ments for repair and maintenance work, availability of transport
facilities and raw materials, have been the main factors which influen-
ced the industrial locations: in the past. In recent years also the
maximum increase in employment took place in the metal-based and engi-
neering industries and this was due to the expansion of railway work-
shops, setting up of rolling mills, and other engineering industries.
technical skill of low-income people. It is learnt that a number of items which were previously procured from abroad are manufactured in these workshops since 1961-62.

Railway and Motor Vehicle Workshops: Some Aspects

The following Table shows that the manufacture of 'rail-road equipment' in Assam has contributed to capital formation in the economy in addition to providing employment to persons in technical jobs.

Table 5.2: Manufacture of Rail-road equipment in Assam

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of factories</th>
<th>Total productive number of persons</th>
<th>Total man-hours worked</th>
<th>Total input in (Rs. in lakhs)</th>
<th>Total output in manufactory (Rs. in lakhs)</th>
<th>Value added by railway (Rs. in lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>7</td>
<td>42.66</td>
<td>3,077</td>
<td>62.60</td>
<td>44.29</td>
<td>103.09</td>
</tr>
<tr>
<td>1962</td>
<td>6</td>
<td>49.13</td>
<td>2,771</td>
<td>56.12</td>
<td>47.71</td>
<td>103.10</td>
</tr>
</tbody>
</table>

By 1961, there were 2 factories in Goalpara, 3 factories in Kamrup and 1 each in Nowgong and Lakhimpur district. All these seven factories consumed coal, coke, firewood, charcoal, motor spirit, other fuel oils, lubricating oil, electricity etc., worth Rs. 6.5 lakhs in 1961 and Rs. 5.2 lakhs in 1962. Moreover, these factories demanded mild steel, pig iron, scrap iron, non-ferrous metals and alloys, timber and chemicals etc. to the tune of about Rs. 37.4 lakhs in 1961 and Rs. 41.5 lakhs in 1962. The railways, thus, provided an impetus to the development of these industries some of which are located in Assam. The factory in Lakhimpur district produced the highest total output.

(worth Rs. 61.5 lakhs in 1961 and Rs. 66.7 lakhs in 1962).

If we compare the relative contribution of railway workshops, motor vehicle workshops and tramway workshop. (Table 5.3) we find that the value added by manufacture is higher in case of railway workshops.

Table 5.3: Motor Vehicle Workshops: Assam

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of productive capital (Rs. in lakhs)</th>
<th>Total H Total T 5 Total (Rs. in lakhs)</th>
<th>Total input of employed persons (in lakhs)</th>
<th>Total output manufactured (Rs. in lakhs)</th>
<th>Total added by manufacture (Rs. in lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>32</td>
<td>78.80</td>
<td>1,323</td>
<td>22.68</td>
<td>26.80</td>
</tr>
<tr>
<td></td>
<td>( 1)</td>
<td>( 2.60)</td>
<td>( 21)</td>
<td>( 0.49)</td>
<td>( 0.24)</td>
</tr>
<tr>
<td>1962</td>
<td>29</td>
<td>80.30</td>
<td>1,241</td>
<td>23.54</td>
<td>24.10</td>
</tr>
<tr>
<td></td>
<td>( 1)</td>
<td>( 2.30)</td>
<td>( 21)</td>
<td>( 0.49)</td>
<td>( 0.22)</td>
</tr>
</tbody>
</table>

(Note: Figures within bracket relate to a solitary tramway workshop in Goalpara district.)

Although the total productive capital is more in motor vehicle repairing industry, its employment capacity is less than the rail-road equipment industry in Assam during the years under study. Further the demand for various inputs was much more in rail-road equipment.

22 The value added by manufacture in these factories per man-hour worked rose from Re.0.91 in 1961 to Re.0.96 in 1962. In terms of capital employed, the value added by manufacture stood at Rs.1.10 in 1962 as against Rs. 1.34 in 1961. Despite this fall, we find that value added by manufacture has been considerably higher in these factories as compared to manufacturing sector in general in which case the figure stood at Re.0.31 in 1962 as against Re.0.34 in 1961.

23 The value added by manufacture per unit of capital employed stood at Re.0.37 in 1962 as against Re.0.33 in 1961 in motor vehicle workshops. But per unit of man-hours worked in motor vehicle workshops this value comes to Rs.1.21 in 1962 as against Rs.1.15 in 1961, indicating relatively higher productivity in these workshops.

industry than in the motor vehicle repair industry, although this industry had more factories. For example, the demand for coal by rail-road equipment factories was about ten times more (about 5,000 tonnes in 1961). In 1961 the only tramwork factory at Goalpara, also consumed coal, coke, firewood, charcoal, motor spirit, other fuel oil, lubricating oil, electricity, metals, chemicals etc. to the tune of about Rs.23,000 only.

The total number of man-hours worked was higher in railway equipment factories than motor vehicle and tramway workshops as can be seen from the Tables in the preceding pages. Even in past also man-days lost in railway workshops were few. The Royal Commission on Labour in India reported that although in 1921 there was a prolonged strike on the A.B. Railway, it had nothing to do with the railways as the strike was in sympathy for the tea garden labourers at Chandpur and attempted at compelling the Bengal Government to repatriate the labour. In 1928 the strike of plate layers and 'mistris' of the D.S. Railway was joined by about 430 men and lasted for 17 days. This, of course, resulted in the grant of an addition of Rs.2 in the monthly wage rate. However, in the post-1947 period discipline in railway workshops in Assam area deteriorated to a great extent as borne out by the happenings of 1971.

Expansion Through Better Technology

We have seen that railways helped in creating ancillary industries both before and after the independence. But another important impact of railways was felt when railways facilitated expansion of certain industries to a desired level through introduction

of better technology. During 1915-30, the period of branch line constructions in Assam, production of tea shot up. In 1880 (in the non-rail situation) the total output of tea was about 22 million lbs; in 1910 and 1915 it rose to 173.42 million lbs. and 245.39 million lbs. By 1950 it was 336.11 million lbs. Considering from these figures of expansion it appears that there was a cause-and-effect relationship between tea production and railways. At first railways were extended because of potentialities of tea and few other industries and later on tea industry further expanded owing to facilities provided by railways. In fact the creation of a new export or the expansion of an existing export industry resulted in the influx of capital to Assam, both in the export industry and in all kinds of passive and supporting economic activities.

In a very real sense the expansion of coal industry in Assam was also the result of the growth of railways. Since 1825 when existence of coal in Assam was known it was thought that their successful exploitation would affect a revolution in the river transport, which had to depend on Ranigang coal for their fuel supply. In fact, several attempts were made to work the coal at the Makum field, but owing to difficulties of labour and transport no large quantity could be exploited. It was only in 1881 when the mine was leased to the A.R. & T. Company and a railway line was constructed from Dibrugarh to the coal-field near the Dehing river that the mines were vigorously worked.

"Ledo colliery was started in 1882. Early in 1883, whilst the railway and marine engineers at Dibrugarh were crying for coal from the mine, the men at the colliery were demanding the completion of the railway so that the coal might be despatched." 26

It may be stated that the Ledo and Tikak-Margherita Colliery Railway, which was an example of railway enterprise without any state

assistance, greatly helped developing local coal industry since 1883. It also enabled the coal industry to use better methods and technology. Since 1881 the output of coal from the mines of the Upper Assam increased to about 2.4 lakh tons in 1900-1901. By 1910 the production of coal from Ledo, Tikak, Namdang and Baragolai rose to over 3 lakh tons a year. The coal was of good quality and was exclusively used by the steamers, navigating the Brahmaputra, and by many tea gardens. A good quantity began to be exported to Bengal as well.

After 1947 the development of coal industry can be attributed also to the intensity of demand for it by the Railway in Assam as illustrated by the following Table.

Table 5.4 : Distribution of Coal — Class of Consumers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Export to other states</td>
<td>1.5</td>
<td>4.1</td>
<td>1.1</td>
<td>1.4</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Government</td>
<td>2.0</td>
<td>2.2</td>
<td>3.8</td>
<td>1.9</td>
<td>1.4</td>
<td>1.1</td>
</tr>
<tr>
<td>Railways</td>
<td>44.3</td>
<td>43.0</td>
<td>51.5</td>
<td>56.2</td>
<td>63.6</td>
<td>66.4</td>
</tr>
<tr>
<td>Inland Steamers</td>
<td>19.1</td>
<td>15.7</td>
<td>8.4</td>
<td>1.7</td>
<td>0.7</td>
<td>0.2</td>
</tr>
<tr>
<td>Tea Gardens</td>
<td>18.6</td>
<td>22.0</td>
<td>19.0</td>
<td>19.3</td>
<td>15.4</td>
<td>15.0</td>
</tr>
<tr>
<td>Brick-Burning</td>
<td>1.5</td>
<td>1.1</td>
<td>0.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>13.0</td>
<td>11.9</td>
<td>16.1</td>
<td>19.5</td>
<td>17.4</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Thus, it appears that while the demand for coal by river steamers declined year by year and declined significantly during 1965 and

27 It was also found that around 1892 the Cherra-Companyganj Railway helped in economical quarrying of limestone in the Knasi Hills. 28 G.O.A. s Department of Economic and Statistics : Economic Survey of Assam, 1970
thereafter, when the riverine route to Calcutta was closed, the demand for coal by the Railway mounted up year by year. In fact, during the Chinese aggression and the Indo-Pak trouble of 1965 almost all the coal available was diverted to railways to keep the communication system in order. Prior to 1967-68 the railways in the north bank of the Brahmaputra were fed by coal from Bengal and Bihar coalfields whereas coal from Margherita and Ledo collieries of Assam was supplied to the entire south bank and in limited quantities to the north bank. Since 1967-68, supply from Assam coalfield has been catering to the requirement of the entire south bank and north bank metre gauge sheds. In view of these, it appears that railway, the creator of large-scale coal industry in Assam, may in some future year turn out to be its destructor with increasing dieselisation of routes.

The power load demand from the Umtru-Umiam system for various sectors also shows railways' high demand possibilities for electricity generated in Assam.

Table 5.5: Maximum Load (Electricity) Demand

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kamrup</td>
<td>2,300</td>
<td>2,600</td>
<td>3,000</td>
</tr>
<tr>
<td>Goalpara</td>
<td>-</td>
<td>3,500</td>
<td>4,000</td>
</tr>
<tr>
<td>Railway</td>
<td>2,300</td>
<td>3,500</td>
<td></td>
</tr>
<tr>
<td>Defence</td>
<td>1,000</td>
<td>3,000</td>
<td>3,500</td>
</tr>
<tr>
<td>Refinery</td>
<td></td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Inland Ports</td>
<td></td>
<td>750</td>
<td>1,200</td>
</tr>
<tr>
<td>Total (including others)</td>
<td>8,450</td>
<td>13,350</td>
<td>14,700</td>
</tr>
</tbody>
</table>

29 For Indian Railway as a whole about 17 million tonnes of coal were bought annually at an expenditure of more than Rs.56 crores (during 1968-69): the expenditure on steel was about Rs.53 crores, that was less than that on coal. (Indian Railway Gazette: Calcutta, August 1969, p.337)

In 1970-71 electrical energy purchased by the N.F.Railway from outside sources was about 26.71 million kilowatt.

Reduced Cost of Transporting Inputs to Industries

The most important direct impact on the economy was perhaps through reduced cost of input to various enterprises owing to fall in transport cost. Fogel has calculated that in case of American economy "the availability of railroads for the transport of commodities" increased "the production potential of the economy by about 3 per cent of gross national product" and that "social saving per ton-mile was less on non-agricultural products than on agricultural ones". Owing to paucity of data it is difficult to calculate by how much the production potential of Assam economy was increased by railways or to what extent there was saving per ton-mile per year.

So far as supply of input was concerned, not only economy in terms of freight (reduced cost of transport) but economy of time was also equally important. Because of peculiar geographical situation an entrepreneur in Assam required more finance to run an industry as compared to his counterpart in Calcutta or other places; raw materials were required to be bought in advance on cash payment which in turn took about a month's time to arrive at the site of production.

32 In India owing to paucity of data output from railway investment is difficult to define and its secondary effect difficult to be evaluated. Moreover, the benefits conferred on the economy have no readily assigned nor fully recoverable market values which make it specially ill-suited for partial equilibrium calculus. (Bharadwaj, K.: Some Aspects of Transportation Planning: The Indian Economic Journal: October 1962: p.129
33 The Assam Provincial Banking Enquiry Committee also reported in 1929-30 - "cases where advances are made on the production of railway receipts are very exceptional in Assam. One or two joint-stock banks in Assam have made a beginning, but the extent of business is negligible". (G.O.A.: Report of the Assam Provincial Banking Enquiry Committee 1929-30, volume I: 1930: p.118)
But with gradual reduction of transit time this difficulty tended to disappear and capital was no longer blocked as before.

An example of increased availability of input at cheaper price was coal which began to be exploited at the Makum fields in 1881 with the construction of the railway line by the A.R. & T. Company. Prior to this tea gardens and the steamers had supply of coal from Bengal, the landed price of which was ten times the pit-head price. Considering from the point of view of the entire tea industry this was a great (social) saving. The railway line not only catered to the need of the enterprises within the State: in fact, in 1884 when the D.S. Railway was completed up to Ledo and opened for traffic, coal from Makum coalfields which had high calorific value, found markets in Calcutta too.

The gain to tea industry can be realised if we look at the pre-rail situation. Before 1882, when a machine unhappily broke down in the midst of a heavy season, recourse had to be taken to the old method, and rolling had to be performed by hand, for which purpose a large band of coolies had to be taken away from important garden work. But with the railway construction, when industries manufacturing tea machinery grew up in the vicinity, the severity of the problem disappeared.

Impact on Small and Miscellaneous Industries: Recent Years

From the Table 5.6 we find that the N.F. Railway purchased

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34 In fact it has been rightly said of the D.S. Railway - "... the coal element was the life of the project ... although the earliest proposal was for a railway to serve the tea gardens along the road from Dibrugarh through Doom Dooma, ... the march of events proved that the line to the coalfield ... was of greater importance than the Doom Dooma section. ... For if the original proposal had been put into effect, the mileage from the coalmines to the Brahmaputra would have been appreciably greater than by the route actually followed ... ". (Gawthrop, W.R.: The Story of the A.R. & T. Company, Op.Cit., p.21)
more than Rs. 10 crores worth of stores in recent years and that more than 95 per cent of these came from indigenous sources.

Table 5.6: Stores Purchased by the Northeast Frontier Railway

<table>
<thead>
<tr>
<th>Year</th>
<th>Imported direct</th>
<th>Purchased in India</th>
<th>Indigenous stores</th>
<th>Total value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>1,047</td>
<td>307</td>
<td>46,845 (97.4%)</td>
<td>48,199</td>
</tr>
<tr>
<td>1968-69</td>
<td>3,284</td>
<td>1,061</td>
<td>1,13,900 (96.3%)</td>
<td>1,13,245</td>
</tr>
<tr>
<td>1970-71</td>
<td>3,406</td>
<td>815</td>
<td>1,20,745 (96.6%)</td>
<td>1,24,966</td>
</tr>
</tbody>
</table>

(Note: Figures in bracket show percentage of total value of stores purchased)

A railway Report of the post-independence year shows that some traditionally imported stores were obtained from nine Indian firms. But out of these nine firms, only one was located in Assam. The other firms were located mostly at Calcutta and Bombay. In 1960-61 out of eleven Indian firms where orders were placed for various items not a single firm was within the State of Assam. In fact, items like block instruments, electrical signalling detector, A.C. slipring electric motor, battery charging rectifier, train lighting dynamo, lead acid cell, switch gear, turbo-generator were not then manufactured in Assam. The extent of backward linkage effect consequent upon railway development appears to be insignificant in Assam in comparison to other States. It may therefore be concluded that the impact of railway development on light engineering industries had been very little or almost nil in Assam area.

35 N.F.Railway: Annual Reports of General Manager
36 N.F.Railway: General Manager's Report for 1959-60, p.227
37 The only firm was Messrs Radio Lamp Works, Gauhati which supplied chokes and starters for fluorescent tubes.
38 N.F.Railway: General Manager's Report for 1960-61, p.266
Similarly, although the average expenditure of the N.F. Railway during 1968-71 in printing works was about Rs. 20.2 lakhs per year, it is doubtful whether any significant impact of this expenditure had been felt by printing presses situated in the area under study as a very high proportion was spent outside Assam.

The N.F. Railway also purchased khadi cloth worth Rs. 7.2 lakhs in 1958-59 and there is recurring expenditure on this item almost every year. In 1968-69 the Railway's purchases increased to Rs. 16.61 lakhs worth of khadi and cottage industry products. But there is no record which indicates that the amount had gone to the producers or industries located in Assam area. In the absence of such expenditure on purchase of locally produced items the multiplier effect of investment is not perceptible. The only way the Railway tried to help the handloom industry in Assam was that in order to facilitate marketing of handloom cloth (including khaddar - both hand-spun and hand-woven) a half-parcel rate at owners' risk, when not press-packed, was introduced since the opening of the Link route.

Movement of Products of Industries

The impact of railways on the industrial sector may also be conceived in terms of volume of products of major industries moved to export markets in addition to various inputs imported.

Coal

The Assam Railway carried about 3.8 lakh tonnes of coal

39 When these were booked at railway risk, rates were same as those applicable to betel leaves, butter etc.

40 The impact of railways on the industrial sector has been more conspicuous in the post-independence era, as evident from the quantum of products moved, although it is well recognised that industrial growth is conditioned by a number of determinants. For example, in Orissa, even with shortage of route mileage and less developed transport facilities "the net output from factory industry increased by more than 300 per cent in 1960-61 over 1956-57 as compared to only about 60 per cent increase in 1956-57 over 1950-51". (N.C.A.E.R.:Techno-Economic Survey of Orissa, 1962, p. 121)
(for public) in 1948-49. During 1954-57 the Pandu Region of the N.E.Railway moved on an average about 33,600 wagons per year. In 1958-59 the N.F.Railway carried about 4.2 lakh tonnes of coal and coke. The quantum of traffic rose to 4.3 lakh tonnes (in metre gauge system) in 1969-70, and as such coal movement by rail transport had been increasing over the period. It was stated that since 1947 the supply of coal from the A.R. & T.Company to different tea gardens in the Upper Assam depended on the performance of rail transport. The A.R. & T.Company required about 80 wagons per day for carrying coal. Coal was also supplied from the Assam coalfields to all the 18 coal consuming railway depots in Assam by rail transport.

Tea

We have already discussed that there is a very intimate relationship between tea industry and railways and there is example of railway station (namely, Doom Dooma Town) serving as many as 18 big tea gardens. As early as in 1939, about 45,000 tons of tea (equalling about 40 per cent of total produce) were carried by the A.B.Railway to the Chittagong port. However, before 1947 railways played a comparatively smaller role in exporting tea produced by about 780 gardens in Assam. In 1950-51 the Assam Railway carried about 1.2 lakh tons of tea and this formed 9.08 per cent of the total goods earnings, which is the highest proportion of earning from any single item carried. During 1954-57 the Pandu Region of the N. E.

41 In a letter to the Railway the A.R. & T.Company stated: "... wagons supplied have been grossly inadequate during the past 3 weeks and whatever few wagons were supplied were being placed at irregular timings resulting in heavy loss in production ... In all, over 600 wagons have been short placed in the past 3 weeks only. Added to this, there are heavy losses in output due to late placements also. Due to non-supply of wagons we are unable to supply coal urgently required by the Tea Industry for the manufacture of tea and they are bound to suffer as a result thereof ... The programme for supply to brick-burners is at a standstill, to destination in the Assam Valley and Cachar ..." (Letter No. 1730/GM dated September 9, 1970, from the A.R. & T.Company)
Railway moved on an average about 20,240 wagons of tea per year. In 1969-70 the N.F. Railway (metre gauge system) carried about 1.7 lakh tonnes which shows that over a period of three decades the increase in tea traffic by rail is not significant as in case of other commodities. However, it may be noted that the figures mentioned above do not show the exact volume of tea traffic moved from Assam as these include a part of the traffic from North Bengal area.

The following Table shows that for some years after 1947 railways moved only smaller proportion of tea produced in Assam.

<table>
<thead>
<tr>
<th>Mode of Transport</th>
<th>1948</th>
<th>1949</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail N.A. N.A.</td>
<td>6.7</td>
<td>22.2</td>
<td>30.3</td>
<td>17.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(14.4%) (28.0%) (36.9%) (23.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>River 42.3 46.1</td>
<td>39.8</td>
<td>56.9</td>
<td>52.2</td>
<td>55.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(85.6%) (72.0%) (63.1%) (76.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Note: Figures in bracket indicate percentage shares between rail and river transport)

No doubt, railway congestion was one of the factors for such a state of affairs. According to the Chairman of the Indian Tea Association the causes of railway congestion in years immediately after the independence were many. As quoted by Griffiths

"there is the aftermath of war; there is the absence of repair facilities; and there is, I fear, a hesitancy of the railway administration to entrust their wagons to their neighbours ... There are long lines of railway wagons, of good quality, now occupied as residential quarters, or as godowns for the storage of the family belongings of migrating officers ... The wagon allotments to tea remain inadequate ..."

When land customs formalities were introduced in the early part of

1948, it led to delays and irritations. The Assam Rail Link could carry only a fraction of total tea exports. The only course open was to make more use of the rivers. In 1954 major troubles were experienced when the Assam Rail Link was breached in forty-four places:

"... bridges were washed away, and on one occasion a locomotive was carried a quarter of a mile downstream by the force of the current ... The Railway was out of action for three and a half months ..."

The result was that after 1947 about 90 per cent of the produce of the Assam Valley and Cachar was sent to Calcutta by river and the balance by rail and air. The river transport tried to relieve the problem arising out of railway wagon shortage. In 1958 the N.C.A.E.R. also observed:

"The insufficient supply of rail wagons has been long-standing complaint ... tea is often held up at stations where there is no adequate covered storage accommodation. The exposure to and damage by rain or through leaks in wagons cause serious losses to the tea industry during the wet weather". 43

Owing to meagre capacity of the Rail Link tea had to move by rail-cum-river or rail-cum-river-cum-rail route, and through-booking by these routes were sponsored by the railways. But the most distressing factor was that on such routes the benefit of long distance rate was not available. It was pointed out that there was telescopic rate for long distance haulage of coal, but this was not applicable to tea estates as the steamer portion was not considered as haulage under rail transport.

In 1963-64 the total volume of tea available for export from Assam (and Tripura) was 1.8 lakh tonnes which was moved by different

modes of transport in the following percentages: rail 13, rail-cum-river 24, river 56.4, road 4.9 and air 1.7. The above percentages may be said to be the general trend as the total tea traffic that moved from Assam by river route each year from 1957-58 to 1962-63 were 1.4 lakh tonnes, 1.6 lakh tonnes, 1.5 lakh tonnes, 1.3 lakh tonnes, 1.4 lakh tonnes and 1.2 lakh tonnes respectively. This indicates that about 80 per cent of the total export moved by the rail-cum-river and the river route. Neamati, Pandu, Dhubri and Karinganj were amongst the important points through which rail-cum-river movements took place. Before the closure of the river route in 1965 (September) tea traffic by rail within Assam also was not heavy as most of these exports were moved by river up to different riverine ghats on the main riverway. However, of all the sections on the railways, the Simaluguri-Mariani section showed the highest density of tea movement (46,557 tonnes) in 1963-64.

After the closure of the river route almost the entire traffic carried by riverways came to be handled by rail transport. But it was experienced that the Calcutta Port Commissioner's Railway had no capacity to handle such a large volume of unprecedented traffic. Hence restrictions were imposed in booking of tea to various points and sidings served by the Calcutta Port Commissioner's Railway. As such during 1967 some of the gardens had to move tea by road to Calcutta at a heavy freight of about Rs. 33 per quintal. The Railway sources indicated that the Calcutta Port Commissioner's Railway did not bother whether tea was moved by rail or road as its share of

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46 According to the Regional Transport Survey (G.O.A.: volume I, p.337) the R.S.N. Company alone moved 1.27 lakh tonnes in 1963 and 1.4 lakh tonnes in 1964, and from tea alone this Company earned about one-third of the total earnings.

47 In the beginning of 1967 the Railway stated that, on the metre gauge system, loading of tea suffered due to imposition of restrictions in booking to the Calcutta docks. (N.F.Railway Magazine, volume IX, No.1, January 1967, p.39)
freight was very negligible (only 16 kilometres being its route over which tea was carried) in comparison to that of the N.F. and the Eastern Railways. However, after 1966 the N.F. Railway introduced alternative procedure with booking of teas to destinations, outside the Calcutta Port Commissioner's Railway premises such as Cossipore Road and then transporting them to the party's godowns by a fleet of trucks engaged by the Eastern Railway. Thus the railways could regain the tea traffic in 1967 to some extent.

In recent years the railways have moved tea by all metre gauge route to the Kandla port by special trains thus avoiding the Calcutta port. And in order to reduce the transit time the Railway has resorted to schemes like Quick Transit Service and the running of Tea Specials. Moreover, in the 3,419 kilometre long route from Tinsukia to Kandla, empty wagons had been supplied in each specials to enable transhipment of the contents of any wagon, getting damaged en route.

However, this has not solved the problem of tea exporters. Before going into details of freights, which are discussed in a subsequent Chapter, it may be mentioned that in 1967 it was calculated that the approximate freight from Mariani to Kandla by all-rail route was Rs.22.11 per quintal or Rs.11.00 per chest whereas the freight to Calcutta was about Rs. 12.00 per quintal or Rs.6.33 per chest. The Railways, however, pointed out in 1969 that rebate in freight could be availed of by clubbing together tea consignments up to eight in number provided their aggregate weight was not less than 65 quintals.

In 1969 an experienced member of the Indian Tea Association pointed out that the damage to tea exports from Assam was four times

more in rail transport than in road transport. In 1970 the Darrang Chamber of Commerce, Tezpur, stated that the N.F. Railway did not make any arrangement to lift tea boxes from the tea factories, in the north bank of the Brahmaputra, to the nearest railway stations as was done in some places in the south bank.

With the opening of the Gauhati tea auction market in 1970 tea tends to be diverted more and more to road transport as it reaches Gauhati (from tea estates) within 12 hours by road as against 5 days by rail. However, tea meant for export (especially from Dibrugarh area) via Kandla has been increasingly carried by rail transport as may be seen from the Table below.

Table 5.8: Movement of Tea to Ports for Export

<table>
<thead>
<tr>
<th>Year</th>
<th>To Calcutta Area</th>
<th>To Kandla (with effect from July 1969)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-68</td>
<td>966 (7,108 tonnes)</td>
<td>-</td>
</tr>
<tr>
<td>1968-69</td>
<td>911</td>
<td>-</td>
</tr>
<tr>
<td>1969-70</td>
<td>936</td>
<td>10</td>
</tr>
</tbody>
</table>

(Note: Calcutta area includes Tea Ware House, Sitpur, Cossipore Road, Khidirpur Dock, Tea Transit Shed)

The road movement of tea to Calcutta was generally from the areas situated in the north bank of the Brahmaputra. However, movement of tea by rail to Calcutta area is cheaper than movement by road transport on account of long leads. This is a factor which cannot be

49 Persons connected with tea industry opined that the Railway should try to carry tea from factory to the rail-head and pallet system may be introduced in wagons to reduce damage from rough handling.
50 Collected from Dibrugarh Town Railway Station, Assam
neglected while discussing the impact of rail transport on tea industry at the present moment. For the rising percentage of transport cost, as calculated by the Tea Board, from 1.8 per cent in 1958 to 2.9 per cent in 1962 may be imputed to the increasing reliance on road transport which may further aggravate the cost ratio if rail transport fails to do the needful. In future years it is expected that the bulk of tea will not move by either river-cum-rail route or road-cum-rail route but will take either all-rail or all-road route as transhipment is dreadful. As the rail freight rates are cheaper than road rates, rail transport has a future provided it can minimise its disadvantages.

Oil

From the beginning of this century railways have been the principal mode of transport for carrying oil products to consumption centres. An early record shows that when a new oil-field was opened out by the Burma Oil Company at Badarpur, the A.B. Railway carried an average of eight 11-ton tank wagons a day to Chittagong for shipment to Rangoon. The balance was shipped by boat and used in oil engines at tea estates.

"The Assam Bengal Railway charged Rs. 50 per wagon per round trip of about 500 miles for this traffic, equivalent to about 1/8 pie per maund per mile on the oil, a very low rate". 51

Around 1915 the A.B. Railway carried kerosene oil of the Assam Oil Company at a very low rate of one-fifth of a pie up to 319 miles. The impact of railways on the oil industry during the early 1940's, when there was acute shortage of transport capacity, is noticeable from the Table 5.9 which shows that the total weight of kerosene oil and petrol carried by the railways during some years was much more than the military traffic.

51 N.A.I.: Railway Department: 1919/Traffic Proceedings, February Nos. 543T-18/1B
Table 5.9: Petroleum Products and Military Traffic Carried by Railways in Assam

<table>
<thead>
<tr>
<th>Year</th>
<th>Kerosene Oil</th>
<th>Petrol</th>
<th>Military Traffic</th>
<th>Total of all commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(in tons)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1940-41</td>
<td>166,219</td>
<td>45,916</td>
<td>19,482</td>
<td>1,866,812</td>
</tr>
<tr>
<td></td>
<td>(8.90%)</td>
<td>(2.45%)</td>
<td>(1.05%)</td>
<td></td>
</tr>
<tr>
<td>1941-42</td>
<td>141,307</td>
<td>41,854</td>
<td>28,971</td>
<td>1,842,363</td>
</tr>
<tr>
<td></td>
<td>(7.67%)</td>
<td>(2.28%)</td>
<td>(1.57%)</td>
<td></td>
</tr>
</tbody>
</table>

(Note: Figures in bracket indicate percentage to total traffic)

After 1947 railways stated that they maintained a fleet of about 720 tank wagons for movement of products of the Digboi refinery. Moreover, orders were placed for tank wagons with higher carrying capacity of 28.5 tonnes for movement of products from the Gauhati refinery.

In 1948-49 the Assam Railway carried about 22,000 tons of kerosene oil in tins, 20,800 tons of kerosene oil in bulk, about 13,300 tons of petrol in tins and 33,400 tons of petrol in bulk. During 1954-57 the Pandu Region of the N.E. Railway moved on an average about 29,849 wagons of oil products per year. In 1969-70 the N.F. Railway (metre gauge system) carried 2.27 lakh tonnes of petrol and 2.28 lakh tonnes of kerosene oil. There is, thus, an increasing rail movement of oil products from and within Assam area.

The Railway in Assam claims that in the post-independence years one of its primary tasks is to help in the economic exploitation of the proved resources in Assam oil-fields. In a way this may be correct. Before the construction of pipelines crude oil used to be carried to the Gauhati refinery from fields by special trains of 25 wagons each at the rate of one train a day. And the tank wagons loaded

52 B.A. Railway: General Manager's Annual Report 1941-42, p. 68
54 It may be noted that in 1950-51 earnings of the Assam Railway from 'Petrol in bulk' was 8.92 per cent of total goods earnings which ranked second only to that from tea.
with petroleum products at different originating points increased to a significant number as may be seen from the Table below.

Table 5.10 : Tank Wagons Loaded with Oil Products from Assam

<table>
<thead>
<tr>
<th>Year</th>
<th>Tinsukia</th>
<th>Noonmati (Gauhati)</th>
<th>Sibsagar Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-62</td>
<td>16,091</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1962-63</td>
<td>11,907</td>
<td>7,878</td>
<td>-</td>
</tr>
<tr>
<td>1963-64</td>
<td>12,836</td>
<td>16,242</td>
<td>-</td>
</tr>
<tr>
<td>1964-65</td>
<td>12,139</td>
<td>16,893</td>
<td>-</td>
</tr>
<tr>
<td>1965-66</td>
<td>11,740</td>
<td>9,030</td>
<td>-</td>
</tr>
<tr>
<td>1966-67</td>
<td>13,343</td>
<td>5,963</td>
<td>1,113</td>
</tr>
<tr>
<td>1967-68</td>
<td>12,971</td>
<td>6,401</td>
<td>1,193</td>
</tr>
<tr>
<td>1968-69</td>
<td>11,697</td>
<td>7,306</td>
<td>1,282</td>
</tr>
<tr>
<td>1969-70</td>
<td>12,514</td>
<td>5,486</td>
<td>1,815</td>
</tr>
<tr>
<td>1970-71</td>
<td>10,095</td>
<td>4,716</td>
<td>-</td>
</tr>
</tbody>
</table>

During 1970 there was considerable drop in loading of petroleum products owing to inadequate empty tank wagons on the entire railway system in Assam.

The rail movement of products of oil industry from the Digboi refinery also showed an increasing trend as seen from the following Table.

Table 5.11 : Principal Outward Traffic from Digboi Station

<table>
<thead>
<tr>
<th>Year</th>
<th>Oil</th>
<th>Wax</th>
<th>Bitumen</th>
<th>Coke</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-68</td>
<td>9.6</td>
<td>2.0</td>
<td>1.7</td>
<td>0.6</td>
</tr>
<tr>
<td>1968-69</td>
<td>9.3</td>
<td>1.7</td>
<td>1.3</td>
<td>0.7</td>
</tr>
<tr>
<td>1969-70</td>
<td>10.7</td>
<td>2.0</td>
<td>1.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>

N.F. Railway : Annual Reports of General Manager, Section I
Collected from Digboi Railway Station
The sectional density of movement of petroleum products on the Railway in Assam was also found to be quite heavy. In Tinsukia-Simaluguri section the daily average movement of products was found to be about 3.15 lakh tonnes during 1962-63 which was one of the highest in Indian metre gauge railway sections. In recent times the real impact of railways was felt in September 1971 when the Assam Oil Company had to cut down its daily production from 1,800 tonnes to 800 tonnes to avoid a shutdown of the Gauhati refinery owing to huge accumulation of finished products caused by dislocation of railways. It was decided that so long as the Railway could not restore movement of oil tankers, the products of the two refineries would have to be sold only to the consumers in Assam, Nagaland and Manipur, which need only a small fraction of the total production of the two refineries. The problem was that suspension of train movement for more than a month owing to floods in north Bihar and north Bengal led to huge accumulation of stocks of finished products like petrol, diesel oil and kerosene whereas the Gauhati refinery had a storage capacity of 20,000 tonnes of petrol, 15,000 tonnes of diesel oil and 10,000 tonnes of kerosene. When it had a crude stock of 12,000 tonnes, the refinery cut down its daily production from 2,000 tonnes to 900 tonnes in order to avoid a total shutdown. Thus, it appears that even after the installation of product pipeline railway's significance to the petroleum industry in Assam has not diminished at all. In fact, the Railway has been the chief carrier of the petroleum and other products of the Digboi refinery, as shown in the Table 5.11. The Railway, no doubt, helped the oil industry as well as the consumers with the introduction of special rates for kerosene oil from Tinsukia to certain stations on the Oudh and Tirhut Railway via

58 The Patriot (Daily), New Delhi, September 3, 1971
the Link route since its opening.

Impact on Development Projects

The relationship between transport development and building activity has been discussed by certain economists. In Assam also development of railways led to increase in building activity owing to railways' own needs and the needs of railway-induced and other industries. Increase of population, apart from growth of industries, also induced the growth of building activity. In fact, railway-induced industries and railway-induced migration affected building activity in Assam in varying degrees at different times. Moreover, there were development projects under Five Year Plans, which had to depend on railways for movement of capital goods.

Cement

The impact of railways on building activity can be gauged by the amount of cement that railways carried in various years. No doubt, transportation improvements have created demand for houses in new areas, both by enabling people to live at a greater distance from their place of work and by shifting the location of production, yet investments under Plans have also created demand for different types of construction materials in Assam. It is interesting to note that even before the closure of the river route railways carried from Bihar about 60 per cent of the total cement requirements of Assam. Moreover, the river transport could carry cement only up to the three main ghats, namely, Dhubri, Pandu and Neamati. All movements to consuming centres in the interior parts of the State had to be done by rail transport.

The total consumption of cement in Assam (including Tripura, Manipur

and Nagaland) in 1962 was 2.86 lakh tons out of which only 1.25 lakh tons was despatched by steamers. This meant only about 44 per cent of the total requirement was carried by river transport. After the closure of the river route, the role of railways in carrying this vital traffic increased further as the feeble cement factory in the State could meet only a small parts of the total needs.

In 1949-50 the Assam Railway carried about 31,592 tons of cement. During 1953 and 1957 the Pandu Region of the N. E. Railway moved an annual average of about 350 wagons of cement. After a few years, in 1969-70 the N. E. Railway (metre gauge system) carried about 4.2 lakh tonnes, revealing that rail transport has been moving increasing volume of this traffic. However, this does not mean that railways could smoothly move the cement requirements of Assam area. During 1964 out of 1.3 lakh tonnes of cement allotted to Assam only 60,000 tonnes could be actually moved into Assam owing to various difficulties.

Iron and Steel, Heavy Machinery etc.

As early as in 1948-49 and 1950-51 the Assam Railway carried about 35,200 and 68,100 tons of iron and steel (wrought). About two decades later, during 1969-70, the N. E. Railway (metre gauge system) carried about 1.5 lakh tonnes of the same material, while in 1958-59 the same Railway carried about 59,000 tonnes and the river services carried about 15,000 tonnes of iron and steel materials to Assam area. This indicates the major role of rail transport in moving these items. The Railway reports indicate that heavy traffic for Assam such as crane, construction materials were moved via Bhagalpur and the remaining traffic were moved via Garhara and via the Indo-Pak route (via Gitaldah) and the river-cum-rail route. Although the river

60 Planning Commission : Commodity Transport Studies : Cement: May 1966
services carried only a smaller volume of this traffic they had an advantage in that they could carry heavier machinery needed for the Assam Oil Company and tea gardens, and generally moved these via Dibrugarh ghat. On the contrary the railways had many difficulties in transporting these goods owing to various restrictions.

The Railway also helped supplying stores and boulders for developmental works when with the expansion of the National Highways and other roads the demand for these basic materials multiplied. In this connection a mention may be made of the Dibrugarh Flood Protection Scheme for which the Railway in Assam had to move within six months (from October 1954) 53 lakh cubic feet of protection materials from Jagi Road and Badulipar to Dibrugarh in addition to transporting 5,000 pieces of sal, 700 tens of cement and considerable quantities of iron and other materials. Within six months 9,712 wagons were delivered at the destination.

Import of Essential Food Items

Coming to a discussion of movement of essential food-stuffs which are products of manufacture we find that railways handled, in addition to other items, a significant volume of sugar and salt imported into Assam.

Sugar

The Assam Railway carried about 17,000 tons of sugar (refined and unrefined) in 1948-49. Although sugar was moved into Assam by river transport as well, railways handled far greater volume of this traffic as evident from the Table 5.12.

62 It was doubted in 1961 that large number of oversize consignments for the Gauhati Oil Refinery were held up at Garhara as they were too big to be transhipped by the metre gauge to Amingaon, near Gauhati. (Lok Sabha Secretariat: Lok Sabha Debates, 2nd Series, volume LIX, No.2, November 21, 1961, Column 381)
Table 5.12: Movement of Sugar into Assam

<table>
<thead>
<tr>
<th>Mode of Transport</th>
<th>1948</th>
<th>1949</th>
<th>1950</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>3.4</td>
<td>6.9</td>
<td>3.8</td>
<td>3.4</td>
<td>4.2</td>
<td>3.6</td>
</tr>
<tr>
<td>River</td>
<td>1.4</td>
<td>0.7</td>
<td>0.06</td>
<td>0.06</td>
<td>1.9</td>
<td>1.7</td>
</tr>
</tbody>
</table>

During 1954 and 1957 the Pandu Region of the N.E. Railway carried on an average about 324 wagons of sugar per year. The Regional Transport Survey of Assam also stated that during the years 1962-65 sugar was generally transported to Assam by all-rail route. In 1969-70 the N.E. Railway (metre gauge system) carried about 1.16 lakh tonnes of sugar. The role of railways in interstate movement of this traffic is predominant as in 1963-64 the entire amount of about 69,000 tonnes of sugar was found to move into Assam from Bihar by rail transport. On the other hand, road transport played its part in intrastate movement by handling the entire quantum of 4,000 tonnes (in 1963-64) from the production centre at Dergaon in the Upper Assam to consumption centres inside the State.

Salt

In early days, salt, no doubt, moved into Assam by river transport. During the post-independence period even when the river route to Assam was not closed, rail transport carried much larger volume of salt than river transport. During 1954 and 1957 the Pandu Region of the N.E. Railway carried on average about 544 wagons of salt to Assam as against 26,000 tonnes carried by the Assam Railway.

66 It may be stated that average load during the run per metre gauge wagon was about 10 tons.
in 1948-49. In 1962-63, even when the river route was open movement of salt to Assam by rail was about four times (73,675 tonnes) to that by river transport (17,855 tonnes). The Railway had exclusive share in movement to some districts such as Nowgong and Sibsagar. In 1965, when the river route was almost closed, movement of salt to Assam by railways was about five times (89,768 tonnes) to that by river transport (17,882 tonnes). According to the Regional Transport Survey about 9,000 tonnes of salt came to different areas of Assam by railways as against only about 2,000 tonnes by riverways. In 1969-70 the N.F.Railway (metre gauge system) carried about 1.97 lakh tonnes of salt.

The cost of transporting salt is a substantial portion of the price of salt. It was pointed out by the Joint Technical Group (Planning Commission) in 1967 that in Assam the price of salt was approximately Rs. 150 per tonne, out of which the cost of transportation alone was about Rs. 130 per tonne. The railways have not been able to help this State in reducing the price of this commodity owing to existence of the Zonal Scheme since January 1949. This scheme of distributing salt from Calcutta affected Assam in two ways. First, the distance from Jamnagar to Dibrugarh Town, in the Upper Assam, is less by the all-rail route than the sea-cum-rail route via Calcutta; and secondly, time taken by the all-rail route is lesser. The transportation of salt from Jamnagar to Dibrugarh Town by the all-rail route is preferable as in such case cost of transport is lesser than in the sea-cum-rail route by about Rs. 34.63 per tonne. The railway

Moreover, rail was the only mode of transport for carrying this essential commodity to neighbouring areas like Nagaland, the then N.E.F.A., Manipur and Tripura.
would have been able to exert better impact if it could carry more salt direct from Jamnagar, Phalodi, Tuticorin, Thana and Kharagoda than from Calcutta. Salt could be moved to Assam at cheaper rate if its movement is tagged not only with Calcutta but also with the west coast.

Apart from this, the rail services have not always been smooth and regular. In August 1971 the State Government complained that though a movement programme of 6,500 tonnes of salt from the west coast in special rakes by all-rail route was accepted by the railways, yet movement was held back since June 1971 on the ground of wagon difficulties. Moreover, requests for preferential movement of food specials to important towns of Assam such as Gauhati, Silchar, Karimganj, Dhubri, Jorhat, Dibrugarh were not accepted by the Railway Board.

In recent years it is found that although rail transport is playing an increasing role in importing essential commodities its capacity is not in proportion to the requirements of Assam. According to the State Government in August 1971 the requirement of metre gauge wagons per month was 2,439 (pulses 605, mustard oil 302, salt 698, sugar 834), excluding the need for wagons for many other less urgent items. Though the State Government placed demand for 2,531 wagons during the second fortnight of August 1971 before the Link Committee meeting, only 431 wagons (about 17 per cent) were allotted for movement of commodities sponsored by the State Government. The traders stated that despite priority programme sponsored by the State, wagons did not move due to operational restrictions. This is a big problem in view of the fact that while the State is mostly dependent on private trade account for movement of food supplies from outside the State, movement on private trade account is accorded a very low priority.

69 State Government's Memorandum to the Union Railway Minister, August 1971
namely, 'D' and 'E'. It is distressing to note that although the state sponsored programme is given a higher priority than the private trade account programmes by the railways, it enjoys a lower priority as compared to the movement programmes of the Food Corporation of India. Moreover, in July 1971 only about 7 per cent of the total number of wagon requirements for Gauhati area could be moved. Although the total monthly requirement of wagons for essential items for Gauhati area was about 1,800 wagons, the number of wagons 'that actually moved' against the programme (of 410 wagons) of the Trade Adviser to the Government of Assam, at Calcutta, was only 125. The situation in respect of Cachar was still worse owing to limitations on the Hill Section.

Impact of Railway Sidings

While discussing the movement of produce of industries the role of railway sidings is also noteworthy. Of the 48 railway sidings in Assam area, as calculated by the Regional Transport Survey (1967), the numbers of sidings connected with different industries were as follows: tea 17, oil 11, timber 7, coal 4, foodgrains 2, fertiliser 1, sugar 1, electricity 1. About 26 were assisted sidings, 13 were private sidings and 9 were public sidings. Of the two important sidings in Gauhati area, India Carbon Limited's own private siding handled Calcined Petroleum Coke (for sending out to Jaykaynagar and Durgapur etc.) and Petroleum Coke (coming from Barauni); and Indian Oil Corporation's siding at Noonmati handled refined oil (going to Gorakhpur area and Tezpur etc.) and spirit and aviation oil (coming from New Jalpaiguri). However, the sidings in Assam were serving the specific purposes for which they were meant, and as such a large number of miscellaneous firms were using different modes or combinations of modes of transport according to their convenience.

71 Ibid.
A survey of modes of transport used by 32 different firms scattered in Assam in raw material imports for production of various items showed that 10 firms used rail, road and steamer services, 9 firms used exclusively railways, 6 firms used rail and steamer services, 5 firms used rail and road services and only 2 firms used road and steamer services. In many cases rail transport was preferred as raw materials had to come from distant places outside Assam. In despatch of products, out of 30 firms, 21 firms used road transport, 7 firms used both road and rail transport and only 2 firms depended on rail transport. The cause of low reliance on rail transport is the absorption of products by local short-distance consumption centres. A number of big enterprises such as the Brahmaputra Jute Manufacturing Company, Gauhati, the Everest Cycles and the India Carbon, Gauhati, used only rail transport as their products were sold in distant markets outside Assam.

Role of State Machinery

The impact of rail transport on movement of essential commodities to Assam has been to a great extent due to initiative of the State Government which set up the office of the Trade Adviser in Calcutta as early as in 1944. After the independence, with the beginning of various projects under the Plans, this office had to maintain close coordination and take steps to ensure materialisation of timely movement of essential commodities, both consumers goods as well as capital goods, to Assam. A review of its activities shows that this office sponsored movement of different kinds of traffic such as sugar, pulses, mustard oil, molasses, cement, iron and steel materials, explosives, sulphur, ammunitions etc. from various sources on different railways to Assam, within the quota made available to it. In 1959 and 1960 an average of about 10 lakh tons of traffic moved
to Assam by all-rail and rail-river routes through the initiative of this office, and the movement was more by all-rail route.

According to the Trade Adviser to the State Government at Calcutta, the actual despatches of all commodities during 1966-67 from various railway zones to Assam were as follows: by rail-cum-river via Jogighopa 1,18,000 tonnes, by all-rail route 17,00,000 tonnes, and by rail-cum-road via New Bongaingaon 40,000 tonnes approximately. This indicates that after the closure of interstate river route railways had a predominant role in regard to the movement of traffic to Assam. During 1968-69 the approximate numbers of wagons sponsored for movement of cement, iron and steel materials and general goods per fortnight were 600, 25 and 75 respectively. And in 1969-70 the numbers of wagons were 400, 15 and 70 respectively. The increase in numbers of wagons sponsored in recent years is evident from the fact that during 1966-67 the numbers of wagons allotted for these items by all-rail route were only 5,148, 1,811, and 1,952 for the whole year: and only 4,059 and 12 wagons were sponsored in case of cement and general goods by rail-cum-river route via Jogighopa.

Without the assistance of this office rail movement of traffic to different Government departments in Assam or to the State in general would not have been so regular and so automatic. During the Emergency of 1962 it was this office which had to see to it that within the limited rail capacity essential food items got priority over other traffic so that a regular flow was maintained and buffer stock was

73 G.O.A. : Administration Report of the Trade Adviser and Director of Movements, Calcutta 1959 and 1960, p.6
74 G.O.A. : Office of the Trade Adviser, Calcutta : Letter No.TA/5/68/638 dated 12.1.1968 to the Secretary, Transport Department, Shillong
75 G.O.A. : Administration Reports of the Trade Adviser and Director of Movements, Calcutta
built up. The fundamental point, so far as Assam was concerned, was that not only things should move but that required commodities should be obtained from producers for loading in time at originating points. This office had to look to this task as well. A close contact with railways by this office helped in moving important items such as cement on top priority basis. Not only rail-river but rail-road movement of commodities was also planned by this office in 1965.

The impact of railways in Assam during different Plans would not have been automatic but for steps taken for clearance of goods imported by State Government departments and public undertakings from Customs and Port Commissioner at Calcutta and ensuring their regular despatch by this office. With the ever-increasing transport needs of this State there is a strong case for running this office in the best possible manner although this office sponsors only a fraction of total goods traffic to Assam.

Sector-wise Analysis of Rail Traffic

After discussing movement of various products by railways when a sector-wise analysis of rail traffic is made we observe that in the early decades of railway development (say from the 1890's to the 1950's) railways in Assam handled mainly products of mines and agriculture as may be clear from the Table 5.13.

For example, during 1902 coal and coke, and grain and pulses (as well as jute) formed about 67 per cent and 12 per cent respectively of the total traffic carried whereas by 1969-70 the share of coal and coke declined to about 7 per cent of the aggregate traffic. Products of manufacture such as iron and steel and cement were almost nil in the list of rail traffic in 1902. Hence for about six decades the principal beneficiaries of the
railways were agriculture and mining.

Table 5.13: Principal Commodities Carried by the Railways in Assam during Selected Years 76

<table>
<thead>
<tr>
<th>Year</th>
<th>Railways</th>
<th>Commodities (in lakh tons/tonnes)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1902</td>
<td>A.B. - 1.61</td>
<td>Total 6.74: coal &amp; coke 4.55 (67%), grain &amp; pulses 0.57, jute 0.38, wood 0.04, oils 0.11, salt 0.08, tea 0.24 (3%)</td>
<td>1. The A.B. Railway carried more grain &amp; pulses, jute and tea. The D.S. Railway carried more coal &amp; coke than any railway in a year. The J.P. and the T.B. Railway carried mainly tea.</td>
</tr>
<tr>
<td>1910</td>
<td>A.B. - 4.56</td>
<td>Total 11.74: coal &amp; coke 6.37 (54%), mineral substances 0.61, grain &amp; pulses 0.89 (8%), jute 0.78, oils 0.40, oil seeds 0.09, wood 0.15, tea 0.55 (4%), salt 0.23</td>
<td>2. Except the A.B. Railway the figures of other railways relating to 1930-31 and 1940-41 are not available.</td>
</tr>
<tr>
<td>1920-21</td>
<td>A.B. - 7.65</td>
<td>Total 14.28: coal &amp; coke 5.92 (41%), mineral substances 0.71, grain &amp; pulses 1.64 (11%), jute 1.29 (9%), oils 0.95, wood 0.42, tea 0.71 (5%), salt 0.48</td>
<td>3. Figures within brackets indicate percentage to the total traffic carried.</td>
</tr>
<tr>
<td>1930-31</td>
<td>A.B. -16.76</td>
<td>coal &amp; coke 1.8 (10%), kerosene 1.0, rice &amp; paddy 1.9, jute 1.3, iron &amp; steel 0.33</td>
<td>4. Except the A.B. Railway the figures of other railways relating to 1930-31 and 1940-41 are not available.</td>
</tr>
<tr>
<td>1940-41</td>
<td>A.B. -18.66</td>
<td>coal for public 1.7 (9%), marble &amp; stone 1.2, fuel 1.1, kerosene 1.6, fruits &amp; vegetables 0.36, jute 1.7, rice &amp; paddy 1.8, cement 0.24, iron &amp; steel 0.35</td>
<td>3. Figures within brackets indicate percentage to the total traffic carried.</td>
</tr>
<tr>
<td>1946-47</td>
<td>B.A. -44.35</td>
<td>coal &amp; coke 4.4 (9%), rice &amp; paddy 4.3, jute 3.4, salt 1.6, cement 0.43, iron &amp; steel 1.0</td>
<td>3. Figures within brackets indicate percentage to the total traffic carried.</td>
</tr>
<tr>
<td>1950-51</td>
<td>Assam Railway</td>
<td>coal &amp; coke 3.3 (11%), rice &amp; paddy 1.8 (6%), jute 2.1 (8%), kerosene &amp; petrol 1.3, tea 1.3 (4%), cement 0.53, iron &amp; steel 0.68</td>
<td>3. Figures within brackets indicate percentage to the total traffic carried.</td>
</tr>
<tr>
<td>1969-70</td>
<td>N.F. (metre gauge)- 64.49</td>
<td>coal &amp; coke 4.3 (7%), marble &amp; stone 3.5, wheat 4.2, jute 3.5, oil fuel 3.5, wood 3.7, iron &amp; steel 1.5, cement 4.2 (7%), tea 1.7 (3%)</td>
<td>3. Figures within brackets indicate percentage to the total traffic carried.</td>
</tr>
</tbody>
</table>

76 Compiled from Reports on the Railways in India, Railway Board, G.O.I., New Delhi
Manufactures came to be handled increasingly only since the 1960's as may be further brought out by the following Table.

Table 5.14: Products Carried by N.F. Railway (metre gauge system) : Sector-wise 77

<table>
<thead>
<tr>
<th>Year</th>
<th>Products of Agriculture</th>
<th>Products of Animal</th>
<th>Products of Mines</th>
<th>Products of Forest</th>
<th>Products of Manufacture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958-59</td>
<td>1,048</td>
<td>8</td>
<td>698</td>
<td>557</td>
<td>137</td>
</tr>
<tr>
<td>1959-60</td>
<td>1,026</td>
<td>13</td>
<td>537</td>
<td>552</td>
<td>151</td>
</tr>
<tr>
<td>1960-61</td>
<td>1,088</td>
<td>16</td>
<td>796</td>
<td>588</td>
<td>208</td>
</tr>
<tr>
<td>1961-62</td>
<td>1,241</td>
<td>13</td>
<td>959</td>
<td>781</td>
<td>198</td>
</tr>
<tr>
<td>1962-63</td>
<td>1,270</td>
<td>12</td>
<td>862</td>
<td>869</td>
<td>244</td>
</tr>
<tr>
<td>1963-64</td>
<td>1,424</td>
<td>17</td>
<td>967</td>
<td>1,266</td>
<td>349</td>
</tr>
<tr>
<td>1964-65</td>
<td>1,260</td>
<td>16</td>
<td>726</td>
<td>1,304</td>
<td>344</td>
</tr>
<tr>
<td>1965-66</td>
<td>1,333</td>
<td>8</td>
<td>934</td>
<td>1,206</td>
<td>310</td>
</tr>
<tr>
<td>1966-67</td>
<td>1,349</td>
<td>9</td>
<td>765</td>
<td>779</td>
<td>270</td>
</tr>
<tr>
<td>1967-68</td>
<td>1,273</td>
<td>9</td>
<td>659</td>
<td>868</td>
<td>320</td>
</tr>
<tr>
<td>1968-69</td>
<td>1,485</td>
<td>12</td>
<td>743</td>
<td>940</td>
<td>379</td>
</tr>
<tr>
<td>1969-70</td>
<td>1,289</td>
<td>8</td>
<td>770</td>
<td>908</td>
<td>383</td>
</tr>
</tbody>
</table>

| Percentage increase(+) or decrease(-) over 1958-59 | (+)23 % | - | (+)10 % | (+)63 % | (+)179 % | (+)128 % |

77 Compiled from Annual Reports of the General Manager, N. F. Railway

(Note: Products of Agriculture: rice in husk, rice not in husk, rice flour, gram & gram products, pulses, gram flour, wheat, wheat flour, jawar & bajra, other grains, groundnuts, oilseeds, cotton raw, jute raw, fruits & vegetables, sugarcane, fodder, oil-cakes, tobacco
Products of Animals: livestock, hides and skin, bone
Products of Mines: coal, coke and patent fuel for public and non-government railways, marble, limestone, dolomite, gypsum, manganese ore & iron ore, mica, sand
Mineral oils etc.: diesel oil, crude oil, kerosene oil, petrol
Products of Forest: charcoal, firewood, bamboo, lac, biddi leaves
Products of Manufacture: sugar, sugar candy, khansari sugar, gur, molasses, salt, tea, soap, matches, tobacco manufactured, vegetable and other edible oils, groundnut oils, mustard oil, coconut oil, cotton manufactured & piece goods, jute manufactured, leather and leather manufactured, rubber manufactured, woolen piece goods, artificial silk piece goods, coir products, cement, cement manufactured, bricks and tiles, china-ware (potteries), electrical goods, glassware, tin, brass, bell metal, aluminium, paper, paints and varnishes, fireworks, caustic soda, soda ash, medicines, alcohol, acids)
2. FREIGHT TRAFFIC AND TREND OF INDUSTRIAL PRODUCTION INDICES

LEGEND

- NET OR FREIGHT TONNE KM (M.C. SYSTEM: N.RLY)
- NET TONNE KM (ASSAM STATE)
- TONNES CARRIED
- TONNES ORIGINATING
- INDUSTRIAL PRODUCTION

YEAR
Thus, it may be inferred that over the period 1958-59 to 1969-70 the N.F.Railway metre gauge system, of which Assam forms the major area, has been handling a higher proportion of Products of Manufacture and Forest as against Products of Agriculture, Animal, Mines and Mineral oils and fuels. During this period of eleven years Products of Agriculture and Mines and Mineral oils etc. carried by the Railway have increased by 23 per cent, 10 per cent and 63 per cent only while Products of Forest and Manufacture handled have increased by 179 per cent and 128 per cent. However, it must be admitted that even in the post-independence era the railways in Assam have been carrying mostly Products of Agriculture. In 1958-59 Products of Agriculture, Mines and Manufactures formed about 35 per cent, 23 per cent and 18 per cent of total traffic of all the sectors mentioned in Table 5.14; and by 1969-70 also the percentages of traffic of the above sectors to combined traffic of all these sectors are about 28 per cent, 16 per cent and 27 per cent respectively.

Freight Traffic and Industrial Production

A study of the indices of rail transport sector (in terms of net or freight tonne kilometres) and industrial production in Assam, as tabulated (Table 5.15) and presented through graph (Graph 2), reveals that there is certain correlation between movement of goods (by railways) and industrial production in Assam; these indices tended to rise or fall together during the period under study. During the period 1961-62 to 1969-70 net tonne kilometres increased at a faster rate than the rate of growth of tonnes carried, tonnes originating and industrial production. The rate appears to be

78 Statistically computed, the coefficient of correlation between net tonne kilometres of the N.F.Railway metre gauge system (the major portion of which lies in Assam) and industrial production is 0.75 and that between net tonne kilometres relating to Assam area and industrial production is 0.96, indicating a positive correlation of high degree.
distinctly faster (about 2.4 times) if we compare net tonne kilometres relating to Assam area with industrial production in Assam.

Table 5.15: Freight Traffic (Metre Gauge : Revenue Earning : N.F.Railway) and Trend of Industrial Production in Assam : Indices

<table>
<thead>
<tr>
<th>Year</th>
<th>Net or Freight Tonnes Kilometres</th>
<th>Tonnnes Carried</th>
<th>Tonnnes Originating</th>
<th>Industrial Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-62</td>
<td>100 (100)</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1962-63</td>
<td>108 (118)</td>
<td>107</td>
<td>121</td>
<td>99</td>
</tr>
<tr>
<td>1963-64</td>
<td>135 (160)</td>
<td>126</td>
<td>125</td>
<td>107</td>
</tr>
<tr>
<td>1964-65</td>
<td>140 (149)</td>
<td>121</td>
<td>122</td>
<td>126</td>
</tr>
<tr>
<td>1965-66</td>
<td>146 (178)</td>
<td>123</td>
<td>111</td>
<td>122</td>
</tr>
<tr>
<td>1966-67</td>
<td>123 (159)</td>
<td>106</td>
<td>100</td>
<td>116</td>
</tr>
<tr>
<td>1967-68</td>
<td>122 (145)</td>
<td>101</td>
<td>98</td>
<td>119</td>
</tr>
<tr>
<td>1968-69</td>
<td>129 (186)</td>
<td>110</td>
<td>104</td>
<td>133</td>
</tr>
<tr>
<td>1969-70</td>
<td>143 (185)</td>
<td>110</td>
<td>109</td>
<td>136</td>
</tr>
</tbody>
</table>

(Note: For Column 2, 3, and 4 the N.F.Railway metre gauge portion only is considered as the major portion of metre gauge lies in Assam, and the broad gauge portion is quite negligible. Moreover, only revenue-earning traffic has been taken into account as this is significant for our purpose.

Figures within brackets indicate index of net tonne kilometres carried within Assam State as calculated (from the Density Statement of the General Manager's Annual Reports) by adding net tonne kilometres over all sections that fall within Assam State.

Column 5: Industrial Production base year 1961-62 = 100 adjusted from base year 1961 = 100)

To sum up, the economy of Assam is a typical example of how growth of transport facilities depends on the expectations of industrial growth. Amongst other factors noted in the preceding pages.

79 From the Table 5.15 it may be noted that during the period 1961-62 and 1969-70 industrial production increased by 36 per cent whereas net tonne kilometres relating to Assam area increased by about 85 per cent.

80 Compiled from N.F.Railway General Manager's Annual Reports and Reports of the Department of Economics and Statistics, G.O.A.
it was especially the plantation industry which attracted rail transport to develop in the far-off corner of Assam, and railways, on the other hand, facilitated quicker expansion of tea industry. The introduction of railways was followed by fall in cost - in both real and monetary terms, economy of time and assurance of regular flow which increased the scope for decision-making. All these gave rise to a state of expectation. The ancillary industries that too grew up alongwith the railways produced a cumulative effect on certain regions of the economy. Industries such as coal, tea and oil expanded to desired level also due to introduction of better technology consequent upon transportation innovation. The reduction of transport cost of input (and output) and saving of transit time, no doubt, had far-reaching effects and must have increased the production potential of the economy. The Railway helped, through various sidings, export of tea and oil and import of essential food-stuffs, and in the post-independence years rail transport was decidedly a more suitable mode of importing heavy traffic such as iron and steel, cement and other materials for Public Works Department and for various industrial projects in the State. In case of certain production units in the State it was experienced in recent years that impact of rail transport was inevitable, both in case of imports as well as exports when longer lead was involved, irrespective of the type of industry.

Apart from helping tea, oil and coal industries in movement of their exports, the Railway also helped in importing food items such as sugar, salt etc. which are products of manufacture. However, the Railway would not have been able to play such a role without the initiative of the State Government. The office of the Trade Adviser to the State Government has been helping considerably in ensuring regular flow of various items from production centres to Assam, but
this alone is not sufficient in the absence of other measures leading to regular loading and timely movement at originating points in addition to improvement in railway operation and increase in rail transport capacity.

Coming to sector-wise analysis of rail traffic we observe that the principal beneficiaries of railways in the pre-independence era were mining and agriculture: manufactures came to be handled in increasing proportion only in recent years, say in the 1960's. However, it cannot be denied that even in recent years the quantum of Products of Manufacture carried by the Railway in Assam is much below that of Products of Agriculture. It has been observed that transport needs of the industrial sector in Assam area have been increasing: during the 1960's net or freight tonne kilometres in Assam area have been increasing at a rate faster than the rate of growth of industrial production in Assam.