Historically we have noticed the following stages of transport evolution in the economy of Assam: first, the early period of low mobility and the subsistence economy; secondly, the era of mechanised river transport (1847-1965); thirdly, the era of steam railways (1882- ) and fourthly, the emergence of mechanised road transport (since the Second World War). River transport played a glorious part for more than a century, while the railways have not yet completed the hundredth year in Assam. The railways emerged about half a century after the advent of organised long-distance river transport. And their impact on different regions of Assam varied at different times according to the relative efficiency (and cost) of river and road transport. For example, during the first decade of this century river services played a bigger role than the railway transport in both the Brahmaputra Valley and the Surma Valley; but as regards railways themselves their impact was more pronounced on the Assam Valley than the other Valley.

In the initial years, short branch railways, completely unconnected with each other, were acting as feeders to river transport, while with the growth and development of long-distance rail transport the situation reversed and the railways in Assam...
emerged as a competitor to river transport. Gradually with the growing importance of rail transport, especially since the beginning of the 1940's, road transport started acting as feeder to the railways all over Assam, as was the case with the latter, when they acted as feeder to steamer services on a significant scale till the 1940's.

Considering railway as an industry, it emerged by the middle of this century as a sector as big as the tea industry in Assam from the point of capital (and labour) employed. Although the railways as compared to advanced countries were less developed, these were sufficiently 'modern' and organised as compared to other sectors (such as banking, roads, education, health, power etc.) of the Assam economy.

Investment on railways in the last part of the nineteenth century and also in the first part of the twentieth century appeared to be justified as better (or alternative) investment opportunities with similar social and private returns were few elsewhere in the Assam economy. As investment on railways was a kind of investment on infrastructure which aided income generation in other sectors (in the superstructure) of the economy, it may not be inappropriate to state that utilisation of the same volume of investment (about Rs. 26 crores by 1940-41) in any other sector - such as tea industry or riverways or roadways - might not have increased the production potential of the Assam economy by a far greater extent. Indirectly, it may be said that resources which were used in railways would have remained idle or used less productively elsewhere in the absence of proper infrastructure facilities which were sine qua non for the development of the Assam economy. Without railway investment
development of certain sectors might not have taken place or might have taken place at a later period. And it has not been observed elsewhere that activity stimulated by railways did replace activity that would have taken place ordinarily.

In recent decades also investment on railways is much more than that on other modes of transport and the total traffic handled by railways appears to be much more than that handled by alternative modes of transport such as road, river and air transport.

From a macro standpoint, the primary role of the railways was in permitting earlier development of certain areas which were capable of producing commodities (such as tea, coal and petroleum) experiencing a growing international and internal demand. To a large extent it is true that railways were constructed to aid tea and, at a later phase, the oil industry. The differential rate of railway construction in east and west Assam in the last part of the last century seems to correspond to differences in the potentialities (for development of plantation and oil industry) in the two regions. In fact the specific requirements of regions first determined the pattern of railway construction in the pre-independence Assam economy. At this point Assam may resemble the United States: as it was the eagerness of Massachusetts textile interests which promoted the construction of railways to their mill sites, it was the plantation interests (and their expectations) which attracted railways in the far eastern part of Assam in the 1880's. Just as the network of railways that covered New England in the 1840's was an important factor in maintaining textile profits and in keeping cotton cloth as cheap as the Manchester products so too in Assam the railways helped earning of higher profits in teas by facilitating competition in
international markets. The same reason also partly explains why there was earlier extension of railways in the southern Assam (which had potential for tea industry) as compared to the western Assam, where lack of profit potential in tea or any other enterprise militated against railway extension except at a very late stage.

It appears that in the case of the United States, the rising world grain prices of the 1850's and the late 1890's made the massive laying of rail lines attractive: in Russia too the rise in grain prices (and the export demand which occurred in the mid-1890's) was one of the factors that made attractive the laying of vast railway nets. In the same way the rising tea (and oil) prices made the railway construction attractive in Assam in the last lap of the last century. Although initially as in case of the United States, Assam was also a vast unexploited area with little population, yet unlike in America private enterprise was not the only instigator of extension of railways in Assam. And the direct and indirect consequences of railway construction could not propel Assam into a 'take-off'.

In opening up the regions of Assam the railways generally yielded social returns far in excess of private returns (or profits accrued to railway companies). While conceiving such social returns from railway development the social costs of creating ancillary industries (to supplement the needs of railways) are also not ignored.

The immediate impact on the economy was through reduced cost of transportation. The indirect impact was the linkage effects - both forward and backward. As regards the forward linkage effect there was, no doubt, expansion of market (for tea, oil, timber, jute etc.) and the backward linkage effect was reflected in the growth of some ancillary industries (such as saw mills, brick works, railway
workshop etc. along the railway alignments) whose products were demanded by the railways (and the fast growing tea industry). However, the effects of forward linkages were more pronounced than those of the backward linkages (such as the supplying of rolling-stock rails, iron and steel etc.) owing mainly to the existing political structure in the pre-1947 era. The derived demand brought about by the railways was not concentrated within Assam. Railway facilities exerted better impact on mobility (of exports) and prices through their influences in lowering the cost of transportation than on growth of industries which could supply inputs to the railways and other allied pursuits.

Yet in spite of the limited effects of backward linkages, railways, as compared to river transport, not only moved more traffic but they brought about certain socio-economic transformations as well in the area traversed. The impact of river (steamer) transport was mainly confined to traffic movement and there was little growth of industries or other important economic activities or trading centres along the river routes in Assam.

As compared to alternative modes of transport (mainly river transport) both money and real cost of transportation by railways were lower. Of course, the railways were initially more concerned with handling little traffic at higher rates so as to maximise profits - a technique which appeared (and was accepted) in subsequent years as incompatible in underdeveloped economy. Later on, reduced rates and concessions were allowed (partly as a result of competition from river services) to attract traffic, and these tended to increase profits to railways. The impact of railways was felt through comparative cheapness of transporting bulky goods - both exports and imports - on which the economy primarily depended.
No other mode of transport could have handled so huge a traffic at such freight rates and to that extent there was saving to the economy as a result of railways. In the absence of railways such traffic (both raw materials and finished products) would have remained less mobile (and less utilised).

It may be too much to say that railways were like any other substitutable input to the economy and that the economy of Assam would have developed or changed even without them had the same amount of resources been diverted to any other direction. Perhaps in the context of relative efficiency, the railways produced in fifty years what the river transport alone would have done in one hundred years.

However, in case of the Assam economy the impact of railways was perceptible not in a framework with automatic and elastic supply curve of cooperating factors. As such the mere presence of railways was not enough to trigger off growth process; the absence of congenial economic and institutional framework was an important constraint. When railways were constructed in virgin lands of America, they induced in many cases not only further railway construction but also led to all types of investment connected with the development of the region - investment in agriculture, mining, housing and the like. In the Assam economy, the appearance of railways could not automatically lead to desired developments in many directions population, literacy, political dependence etc. were constraints in the early decades of railway development. There were few islands of development in the eastern Assam surrounded by a sea of backward traditional primary sector and there was little spread-effect from growth of more developed and organised manufacturing sector.
No doubt, as in America, to a certain extent in Assam also railways were built ahead of demand, especially up to the beginning of the present century. However, the question of short-run expected traffic in siting the lines was not entirely neglected. In certain regions demands were already there: more especially, tea and coal industry which grew up in the middle of the nineteenth century were urgently looking for a more convenient method of transportation for their expansion to an economical level or to an optimum size.

Although the Murkong Selek line, constructed in recent years, appears to be an example of railway extension ahead of demand and appears to be a line with standby facility, yet the line passes through certain old towns and villages and in fact the whole section, now treated as a strategic line, was constructed for defence reasons.

It has been stated that in Assam railways helped more those areas where there were high potentialities for development. In such areas railways followed rather than led the development process. In fact railways were not the sole cause of development of areas through which they passed, but they simply opened up certain areas that were already populated (such as Dibrugarh, Digboi in earlier decades and North Lakhimpur, Dhemaji in recent years) and linked up the port towns (of Chittagong and Calcutta) with interior places, some of which had already attained certain size and importance owing to the facilities of river transport. In the pre-independence era railway alignments were generally made not with reference to various important factors (such as linking towns and areas of economic potentiality or linking production and consumption centres by the shorter route): but the growth of one or two big industries (where foreign capital was attracted and whose products had rising
international demand) appeared to be the main consideration for determining the alignments - so much so that the far-off eastern Assam was linked up with the Chittagong port through extremely difficult and costly Hill Section.

It has been observed that before the independence, especially in the early years of railway development, quantitative aspect of transport was more important and the railways played not only a facilitating role but also initiated development of a few (ancillary) industries in the State, although in a restricted region. But after the independence, in recent years, when the economy developed further, railways' role became gradually passive: the importance of other cooperating factors in the growth process increased. As such the qualitative aspect of transport assumed importance. For instance, river-rail or rail-road service between New Bongaigaon and the Upper Assam became a great failure, though well-devised, despite the fact that Assam was suffering from a chronic shortage of transport capacity, particularly in interstate traffic movement. This showed that the post-1947 economy of Assam needed not simply any type of transport facility but better services with little risk of delay, damage or pilferage in transit. Such a consciousness did not arise even in the mid-twentieth century Assam when the economy was experiencing mere lop-sided development and when there was no developmental planning and no diversified traffic as in recent years.

It is difficult to say whether railways' impact on the economy would have been better in the presence of a strong competition with other modes of transport. But it has been observed that in the absence of strong competition in this area, railways in Assam had an
easy market to exert their dominance especially in long-distance bulky traffic. In Assam the problem of transport coordination appears to be less urgent than the problem of meeting increasing transport needs.

In view of the peculiar production pattern in the economy and the geographical location of the State in the map of India the rail transport's impact is bound to be felt in a more pronounced manner for many more years. The road transport will take time to emerge as a powerful substitute.

It has been noted that in an economy characterised by production of few commodities, transport capacity is very often wasted owing to preponderance of one way traffic and movement of empties in the other direction. Unless there is structural change in the economy transportation planning may not bear much fruit. A more planned spatial distribution of economic activities appears to be a precondition for better impact of existing (or potential) rail transport capacity on the economy.

Transport capacity can be defined only with reference to a particular point of time. For, the optimum or standby facility in the economy with resource endowments, may turn out to be under or below capacity after some time-lag. In the case of the area comprising Assam (and the rapidly changing neighbouring regions), transport capacity is, therefore, to be constantly reassessed in a dynamic context, from time to time, taking into account the available facilities and needs of the economy.

In the absence of complete and accurate data of the economy it is difficult to estimate the transport needs of different sectors in future years. It is also difficult to visualise the nature of the
shift in the production possibilities within the economy or substitution possibilities amongst various (modes of) transport inputs. With the closure of the river route (since 1965) dependence on railways has been increasing — more so when the increasing volume of 'bridge traffic' to and from the four States and the two newly created Union Territories around Assam has become obvious. Although river services between Assam and Calcutta (via Bangladesh) have been resumed recently (in November 1972) by the C.I.W.T.C., the future of interstate river transport remains in the womb of uncertainty: the facilities of transit through Bangladesh, apart from other economic considerations, will be matters of utmost importance. It has been observed that the average rate charged per tonne kilometre by railways was lower than that for short-distance river transport and long-distance road transport to and from Assam area. As such river transport appears to be more costly for intrastate traffic and road transport is uneconomic for long-distance (interstate) traffic under the existing conditions. Assam is bound to depend more and more on railways with an uncertain interstate river route.

It has been observed that railway kilometreage increased substantially only in recent years — after a gap of several decades since the extensions made under the ex-A.B. Railway. However, railway facilities in Assam cannot be measured, with justice, by railway route or track length alone: factors like location of railway stations and better utilisation of existing track capacity — amongst other factors — are equally important. Hence a scheme for increasing railway capacity and facilities may be evolved not with reference to mere 'popular' or regional demands but with reference to
the overall problems and requirements of the economy and the existing transport structure. Therefore, only an integrated phase-wise scheme can be suggested at this moment.

Coming to the agricultural sector, it has been observed that an extensive railway network existed with a backward agricultural economy. However, such a paradox can be explained in terms of institutional factors. In the agricultural sector railways helped primarily by facilitating disposal of marketable surplus and indirectly affecting production through the mechanism of price incentives. However, no exact data are available to indicate that farmers' price variation and middlemen's profits declined as a direct consequence of the emergence of railways; for, these were affected by many other factors apart from government's agricultural (procurement) policy. On the other hand it has been noticed that certain parts were growing to be surplus paddy, jute and timber producing pockets despite their remoteness from railways. No doubt, area under cultivation increased with railway extension but agricultural production, on the whole, was only indirectly affected by railways, especially in the post-independence era.

Industrialisation in Assam started earlier in the eastern part because of natural endowments although the area was served only by a fragmented railway that was unconnected from the main lines for a considerable time. Although the railway facilitated the earlier development of the eastern Assam it cannot be denied that the development potential of the eastern districts (the then Lakhimpur and Sibsagar) was equally responsible for earlier emergence of railways in those areas. The tea industry was not initiated by the
railways as the railways came many years after some gardens were already established. On the contrary, as it has been already stated, the prospect of tea, coal and oil was mainly responsible for railway extensions in far-off parts of Assam during the 1880's. And the railways became successful as there existed a prior dynamism in tea, oil and coal bearing areas.

On a closer study it has been noticed that railways were at first specific to tea industry (which was the core of the industrial sector in Assam) as in those days there were no better substitutes to railways (and garden tramways). The railways could not play the exact role of a leading sector when it was specific to a particular industry and not general to the whole economy (as a infrastructure). This is one of the reasons why railway investments did not result in rapid growth of a dynamic industrial sector in the State.

Railways had primarily a facilitating role rather than the initiating role in the industrial sector of the pre-independence era. Industries such as tea, coal and oil depended on the railways for their expansion and further development and railways could not create a constellation of mutually complementary (new) industries as in case of some western economies.

The overall impact of railways on the economy as a whole was more in the pre-independence era than in the last two decades. The long-distance river transport could help only in handling a part of the traffic. The railways not only handled traffic but also helped expansion of some existing industries and growth of certain new industries although in a restricted area. However, during the post-independence years railways' impact on industrial sector has been more than on agricultural sector; the agricultural sector felt
major impact during the pre-1947 period as a result of increase in land under cultivation and productivity, shift of emphasis to production of cash crops and increasing movement of bulky low-value agricultural products at surprisingly low rates with extension of railway network to interior undeveloped areas. A study of the principal commodities carried by the railways during the pre-independence era shows that the total agricultural produce handled by railways was more than that of industries. The principal beneficiaries of the pre-independence rail network in Assam were mining and agriculture. On the other hand, in the post-independence era, more especially in the 1960's, the total volume of produce of industries (such as petrol, kerosene oil, tea, iron, cement, salt, sugar - excluding that of mining sector such as coal) handled by railways has been increasing at a higher rate than that of agricultural produce (like rice, wheat, wood, jute etc.). However, the products of agricultural sector still predominates the list of aggregate rail traffic in Assam area.

Considering the economy as a whole, railways - when viewed both as a determinant of development as well as an industry - did lead to an increase in production potential of the Assam economy through reduced cost of transport (of input and output) and through effects of forward and backward linkages, although it is difficult to quantify the contribution - the increment in output directly attributable to the construction and maintenance of railways - in terms of exact percentage owing to openness of the economy and the absence of aggregated data on the railway's consumption of various goods. In the context of the Assam economy it has been observed that the relationship between the indices of rail transport output (such
as net tonne kilometres, tonnes carried and tonnes originating) and the indices of agricultural and industrial production, state income and population show not only an all-India trend but also the trend of (now) mature economies in their developing stage. However, the coefficients of correlation showed variation in case of Assam basically due to nature of economy and the production pattern. In fact, the transport (rail) output has been expanding at a rate much faster than that in other sectors of the Assam economy, and the difference in rate of increase has been found to be the most in comparison to agricultural production. Under the existing circumstances such a trend is expected to persist for a long time to come.