The economy of the Brahmaputra valley is predominantly agricultural. Bulk of the people are living in the rural areas and agriculture is their sole occupation. In fact, over 60 per cent (estimated) of the total working population are engaged as cultivators and agricultural labourers, whereas, at the all-India level this figure is about 67 per cent.¹ This indicates that the economy of the Brahmaputra valley is not much different from the national economy in the sense that primary activities dominate the occupational pattern. The secondary and tertiary activities engage only a small segment of the total working population.

The Brahmaputra valley, no doubt, has high pressure of population on land, and the per capita income is low.² A general description of the valley's agricultural economy is attempted in the succeeding paragraphs.

Economy of Brahmaputra valley

Agriculture forms the mainstay of a large chunk (about 89 per cent)³ of the valley's population who are living

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2. In 1975-76, the per capita income in Assam (which can be comparable to the Brahmaputra valley) was Rs.794, compared to the all-India figure of Rs. 1021 (Source: Basic Statistics of North Eastern Region, 1980, North Eastern Council Secretariat, Shillong).
in the rural areas. Agriculture continues to be practised in the most traditional way and the productivity of crops is much below the national average. The farmers use old implements which are obsolete and inefficient from the point of raising agricultural productivity. Due to the poor economic conditions of the farmers, as also other environmental hazards like perennial floods, occasional droughts; non-availability of inputs like good quality seeds, fertilizers, insecticides, pesticides etc in time and in sufficient quantity. Agriculture is a seasonal occupation in general, which satisfies the annual subsistence needs of the individual farmers mainly.

The valley's agriculture continues to reel under the impact of floods; inadequacy of irrigation, insufficient power supply, poor transport and marketing facilities. These infrastructural drawbacks seriously affect agricultural transformation in the valley. During the preceding three years (1979-82), the impact of the Assam agitation (on foreigners' issue), also retarded the pace of socio-economic development, and the economy as a whole too, was subjected to severe stress and strains. The industrial sector of the valley, is also in a none-too-happy position. Except, the tea industry which recorded impressive growth during 1980, the other industries did not record overall good performance in raising production. On the whole, since the economy is not diversified to the desired extent, due to
several constraints like remote geographical location, inadequate supply of raw materials, shortage of power, transport bottlenecks and so on, there is limited scope for employment of the local people outside agriculture. Only in the districts of Sibsagar and Dibrugarh in the upper Brahmaputra valley, where some amount of coal, oil, natural gas and fire clay occur, there are significant number of persons engaged in mining and allied activities. These districts also have considerable number of industrial establishments like oil refinery, fertilizer factory, sugar mill, tea gardens and tea factories, besides a large number of wood-based industries. In the lower Brahmaputra valley we find a number of important industries like two oil refineries, two paper mills, two jute mills, an aluminium factory and a match factory. All these large and medium industries have not been able to provide adequate employment opportunities to the local people.

The Brahmaputra valley, as a whole, has considerable number of agro-based industries like rice mills, flour mills, and oil mills; bakery units, automobile repairing units and engineering industries. These industries are small, and cater mainly to the needs of the population living in their immediate hinterland. Their employment generation capacity is consequently small. Moreover, such types of small-scale industries have come up mainly in the urban centres, and their spatial distribution pattern is not
uniform. Weaving of handloom fabrics, 'endi', 'muga', and 'pat' textiles constitutes an important household industry, especially in the rural areas.

The tertiary sector engages a considerable number of persons (about 23.6 per cent of the valley's total working population) in 1981 (estimated). This is a reasonably good figure considering the poor diversification of the valley's economy.

Salient features of agricultural economy

The Brahmaputra valley is a geographical unit which is favourably endowed with vast natural resources. From the view point of agriculture, the valley has rich potentialities of becoming the 'granary' of India, provided the vast untapped potentials of land and water resources are fully utilised and rationally managed. The valley lies in the moderately high rainfall zone (average annual rainfall exceeding 175 cm), but, this is by no means a blessing for the people inhabiting the region. In the valley, floods and droughts of varying intensities occur with wide spatio-temporal variations and far-reaching consequences, and this affects the agricultural economy of the farmers in particular, and the valley as such.

The valley has witnessed large numerical increase of population in the decades succeeding 1930 in general, and more importantly from 1951 onwards. This is
partly due to natural growth, and influx of people from outside the State. No doubt, the 'population explosion' in the valley has reached alarming proportions, and this is amply clear from the high pressure of population on land. The estimated population figures for 1981 shows an overall density of 307 persons per sq.km in the Brahmaputra valley, compared to a density of 221 persons per sq.km in the country (1981 census). The overall density figures in the valley do not convey much idea. The population pressure on land becomes clearer if we take the total population pressure on the land area available for cultivation (net area sown). In this case, the population density in the valley comes to 708 persons per sq.km (in 1981). However, a close scrutiny of the per capita holding size would throw adequate light on the intense pressure of population on land.

According to the World Agricultural Census Report on Assam (1976-77), the per capita holding size is 1.37 hectares for the State as a whole. In the Brahmaputra valley it is 1.32 hectares per capita, and at the district level it varies between 1.12 hectares per capita in Darrang to 2.01 hectares per capita in Dibrugarh district. The per capita holding size for the country (India) in 1970-71 was 2.30 hectares. This compares favourably well with Pakistan (2.35 hectares),

Nepal (1.23 hectares), Indonesia (1.05 hectares) and Japan (1.01 hectares) per capita respectively.\(^5\)

It must be admitted that the per capita holding size in the Brahmaputra valley is much below the all-India level. This is due to a number of factors, but more importantly, the high population pressure on the limited land available for cultivation. The agricultural situation in the Brahmaputra valley cannot be compared to the country as a whole. This is not only due to the small holding sizes in the valley, but also, owing to poor adoption of modern farming techniques that are so essential to raise production (in the small holdings), and, due to insufficient supply of modern inputs at subsidized rates, or on hire basis to the farmers of the valley. In addition, there are several infrastructural constraints (referred earlier). Consequently, agriculture in the valley is yet to be channelised on commercial lines, for meaningful socio-economic transformation of the valley's rural economy.

Of the valley's total population (in 1981), a little over 20 per cent are engaged as active workers. Again, of the total workers (33,05,081 persons), about 14,32,515 are engaged as cultivators and 5,65,838 as agricultural labourers. Their percentage to the total working population being 43.21 per cent and 17.07 per cent respectively. The total

BRAHMAPUTRA VALLEY

PROPORTION OF AGRICULTURAL WORKERS TO TOTAL WORKERS
1981 (ESTIMATED)

INDEX TO DISTRICTS
1. GOALPARA
2. KAMRUP
3. DARRANG
4. NOWGONG
5. SIBSAGAR
6. LAKHIMPUR
7. DIBRUGARH

OTHER WORKERS
CULTIVATORS
AGRICULTURAL LABOURERS

BRAHMAPUTRA VALLEY
TOTAL WORKERS = 33,05,081 PERSONS.

N.B. THE CIRCLES ARE IN PROPORTION TO THE TOTAL WORKING POPULATIONS OF THE DISTRICTS.
agricultural workers amounts to about 60.28 per cent of the valley's total workers. Among the districts, Sibsagar (34.45 per cent) has the lowest, and Goalpara (76.08 per cent) has the highest share of their respective total working population engaged in agriculture (Map 17). The conspicuously large number of agricultural labourers among the valley's working population shows that there are considerable number of landless labourers and small and marginal farmers' among the valley's agricultural population. Here reference may be made to the prevalence of rural indebtedness, particularly among the landless agricultural labourers and marginal farmers'. The two categories of workers borrow money from the private money lenders mainly, for meeting their immediate cash requirements for buying agricultural inputs, and to meet other consumption requirements like marriage, medical treatment, expenses in connection with children's education, funeral rites and so on.7

Cropping pattern...

The gross cropped area in the Brahmaputra valley was 2,845 thousand hectares in 1976-77. Mono-cropping covers about 2,309 thousand hectares. The area under double/multiple cropping is small (only about 536 thousand hectares), which shares nearly 23.20 per cent of the gross cropped area. In

6. This is inevitable due to the absence of adequate number of financial institutions in the rural areas.

7. Assam On The Job, Chief Minister's Secretariat, Govt. of Assam, Gauhati, 1977.
general then, mono-cropping is the rule in the valley. The three varieties of paddy viz. autumn, winter and summer which together share about 67 per cent of the gross cropped area of the valley, are grown here in different times of the year. In addition, rapeseed and mustard are grown in considerable quantities in the three upper valley districts of Lakhimpur, Dibrugarh and Sibsagar. Sugarcane cultivation is important in Dibrugarh, Sibsagar and Nowgong districts mainly. Jute cultivation, which is done mainly by the Muslim immigrants along the banks of the Brahmaputra and its major tributaries, is found on an extensive scale in Goalpara, Kamrup, Darrang and Nowgong districts. Among the other important crops which are grown in varying proportions in different parts of the valley, mention may be made of wheat, maize, potato, gram pulses, sesame, arecanut, banana, coconut, tobacco, chillies etc. Most of these crops are raised during the kharif season, while the rabi crops are few in number and cover only a small area. Essentially, the cropping pattern is dependent on the availability of sufficient rainfall, suitability of the soil for growing a particular crop, or crops, and the environmental and economic perceptions of the individual farmers.

Area under High-Yielding Variety

The State Government has given much emphasis to the cultivation of high-yielding varieties of a few selected
Among them, the cultivation of high-yielding variety of paddy is the most important. Side by side, attempts have been made to develop improved varieties of local seeds. "As a result of these efforts I.R.-8, T.N.-1, Manohar Sali, Pusa and Joya became most popular High Yielding Varieties grown in the State". The 'Ahu' and 'Sali' varieties of paddy have large coverage in the valley, as also, in the State as a whole. Whereas, the 'Ahu' paddy covered an area of 79,623 hectares; the 'Sali' variety covered 4,29,000 hectares in 1978-79. The two varieties together covered 22.48 per cent of the total area under paddy in the valley, and 17.88 per cent of the gross cultivated area in 1978-79. The area under high-yielding varieties of other crops like wheat, pulses, mustard and jute is not very significant.

Average yield of principal crops

The Brahmaputra valley produces a variety of crops. This does not necessarily mean that the yields of those


9. In areas with assured irrigation water, the farmers used full package of practices and the yield obtained was 75 per cent higher than partially package area where the available irrigation water was not adequate. (Source: - Quick Evaluation Study of the Impact of the Agricultural Schemes taken up under the plans on production and adoption of improved method of cultivation in the State, Planning and Development Department, Govt. of Assam, Gauhati, 1979, p.14.)

10. Basic Agricultural Statistics, 1978-79, Director of Agriculture (Statistical Wing), Govt. of Assam, Gauhati.
crops are comparable to the average yields obtained at the national level. This is primarily for non-commercialisation of agriculture in the valley; because, crops are grown by the farmers mainly to satisfy their annual subsistence needs. The table-1 below shows the average yields of selected crops in the valley, compared to national level yields.

Table - 1

Average yield of selected crops in 1978-79

(in kg/Ha)

<table>
<thead>
<tr>
<th>CROPS</th>
<th>Brahmputra valley</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>949</td>
<td>1,339</td>
</tr>
<tr>
<td>Wheat</td>
<td>1,015</td>
<td>1,574</td>
</tr>
<tr>
<td>Potato</td>
<td>5,206</td>
<td>12,812</td>
</tr>
<tr>
<td>Gram pulses</td>
<td>483</td>
<td>741</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>34,470</td>
<td>53,260</td>
</tr>
<tr>
<td>Jute</td>
<td>1,393</td>
<td>1,308</td>
</tr>
<tr>
<td>Rapeseed and mustard</td>
<td>436</td>
<td>528</td>
</tr>
</tbody>
</table>


The foregoing table shows that, except jute, all other crops have poor yields in the valley, compared to the national average yields. This is because, majority of the farmers being poor, they are not able to invest sufficient money on the land for raising crop production vis-a-vis obtaining beneficial returns. Moreover, the inputs like fertilizers, good variety seeds, pesticides and controlled/assured water supply are not within easy reach of the farmers.

Floods and agricultural economy

Floods have been the innate situations, directly related to the valley's economy, perhaps, since the time the Brahmaputra river and the plains came into existence. The flood waters which replenish the soils annually by deposition of fine silts, impregnated with rich organic matter and facilitates the easy cultivation of a number of crops is a boon; but, on the other hand, floods are also an annual menace. The flood waters which come in successive waves between June and September (coinciding with the monsoon season), cause extensive damages and leaves behind a trail of misery and sufferings on the affected people of the valley.

In the 1980 floods, for example, all the districts of the valley were affected. The total affected area was about 1,240 thousand hectares which comprised about 22 per cent of the total geographical area of the valley. In the same year
as much as 287 thousand hectares of cropped lands were damaged. This comprises nearly 23 per cent of the total flood affected area of 1,240 thousand hectares. Concomitantly, the total cropped area affected by floods comprised about 11 per cent of the gross cultivated area of the valley. This indicates that the cropped area affected by floods constitutes a significant share of the gross cultivated area. Its effects are disastrous for the poor farmers, whose crops are damaged and who solely survive on their produces from land. The cumulative effect is that agricultural production falls, and thereby the returns from agriculture—both cash and kind falls steadily. Admittedly, the total value of flood damages runs into several lakhs of rupees annually. 11

Needless to say that, floods and the agricultural economy are interdependent, and unless flood control schemes are carried on with much foresight and pragmatism, the agricultural economy, as also, the general economy of the valley will be constantly ravaged even in the years to come. The problem of floods should be viewed in the background of the growing pressure of population on land, the rapid encroachment of settlements in flood prone areas, and the need for intensifying agriculture (by raising overall production), to satisfy the demands of a numerically increasing population.

11. In 1980, the total value of flood damages was about Rs. 3,981 lakhs (Source: Economic Survey, Assam, 1980-81, Directorate of Economics and Statistics, Govt. of Assam, Gauhati).
Irrigation facilities

While dealing with the agricultural economy of the valley, reference has to be made to the basic infrastructures that are presently available in the valley. One of the essential infrastructure for agricultural development is irrigation facilities. During 1977, about 2,72,240 hectares of land was covered under irrigation in the valley. This means that nearly 9.57 per cent of the gross cropped area in the valley is under irrigation. This is a very small figure, compared to the national average of 13.30 per cent. Moreover, there is considerable disproportion between irrigation in the kharif and rabi seasons. Water is needed in rabi season, but most of the irrigation schemes are made only for kharif cultivation. In major part of the valley, water remains surplus for kharif cultivation. It must also be noted that during the kharif season crops are destroyed by the annual floods, but, in the rabi season inadequate supply of water restricts the cultivation of more crops. This explains why most of the fields remain out of cultivation during the rabi season, though a cool and humid climate prevails, and there is no threat of floods. Consequently, agricultural production suffers. The seasonal character of agricultural operation needs innovation through extensive irrigation, especially for rabi cultivation—when
the surface level of most of the rivers falls enormously and cannot supply adequate moisture to the top soils.  

Power situation

In the valley, the slow pace of power generation acts as a barrier to rapid socio-economic transformation, particularly of the rural areas. Due to poor availability of power, agricultural operations and industrial development have not been able to keep pace with the requirements of a numerically increasing population. For example, it has not been possible for the farmers to energise sufficient number of pumpsets, for drawing water from the underground sources, for supplying water to the crops that are grown during the rabi season, and occasionally in the kharif season. In the case of industries, load shedding creates disruptions in their smooth functioning. Also, power shortage has repelled entrepreneurs - both local and from outside the State, for setting up major industries in the valley.

The valley has a total number of 17,649 villages (1971 census), of which only 2,597 were electrified

12. The ground water table is invariably shallow in greater part of the valley, which may also be explored to meet the deficiency of water, particularly in rabi season.
upto 1977. The table-2 below shows the percentage of electrified to total inhabited villages in the districts.

Table -2

Percentage of inhabited villages electrified.

<table>
<thead>
<tr>
<th>DISTRICTS</th>
<th>Total number of inhabited villages</th>
<th>Percentage of inhabited villages electrified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goalpara</td>
<td>3,819</td>
<td>3.10</td>
</tr>
<tr>
<td>Kamrup</td>
<td>3,144</td>
<td>11.35</td>
</tr>
<tr>
<td>Darrang</td>
<td>2,538</td>
<td>10.14</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>1,675</td>
<td>2.90</td>
</tr>
<tr>
<td>Dibrugarh</td>
<td>2,167</td>
<td>13.41</td>
</tr>
<tr>
<td>Sibsagar</td>
<td>2,345</td>
<td>22.48</td>
</tr>
<tr>
<td>Nowgong</td>
<td>1,961</td>
<td>10.06</td>
</tr>
<tr>
<td>Total: Brahmaputra valley</td>
<td>17,659</td>
<td>14.70</td>
</tr>
<tr>
<td>India</td>
<td>5,75,936</td>
<td>40.42</td>
</tr>
</tbody>
</table>


The above table shows that nearly 14.7 per cent of the total inhabited villages in the valley are electrified, compared to about 40.4 per cent at the all-India level (in 1979).
Obviously, the rural electrification schemes have to be accelerated to cover the hitherto uncovered villages, so as to provide the necessary base for transforming the rural economy of the Brahmaputra valley. Uninterrupted and adequate power supply is also essential for meeting the needs of the urban population, as also the industrial and commercial establishments located in the towns.

Other infrastructural facilities

The problem of agriculture in the valley can also be viewed from other angles. Essentially, it may be possible to grasp the situation of poor infrastructural facilities in the valley from the following lines. The Economic Census of Assam, (1977), has thrown up interesting data in regard to communication and other facilities. It is revealed that only 1.9 per cent of the villages have railway communication, 19 per cent have roadway communication, 13 per cent post offices, 2.8 per cent have fertiliser depots and seed stores, 1.9 per cent villages have warehousing facilities, 1.7 per cent banking facilities and 4.4 per cent have credit cooperative societies within the village. These figures relate to the State (Assam) as a whole, but, the situation in the Brahmaputra valley is not much better than this. The position in respect of infrastructural facilities reflect the agricultural standard and its economy in the valley.