

## GEOGRAPHY OF ASSAM

### KEY POINTS

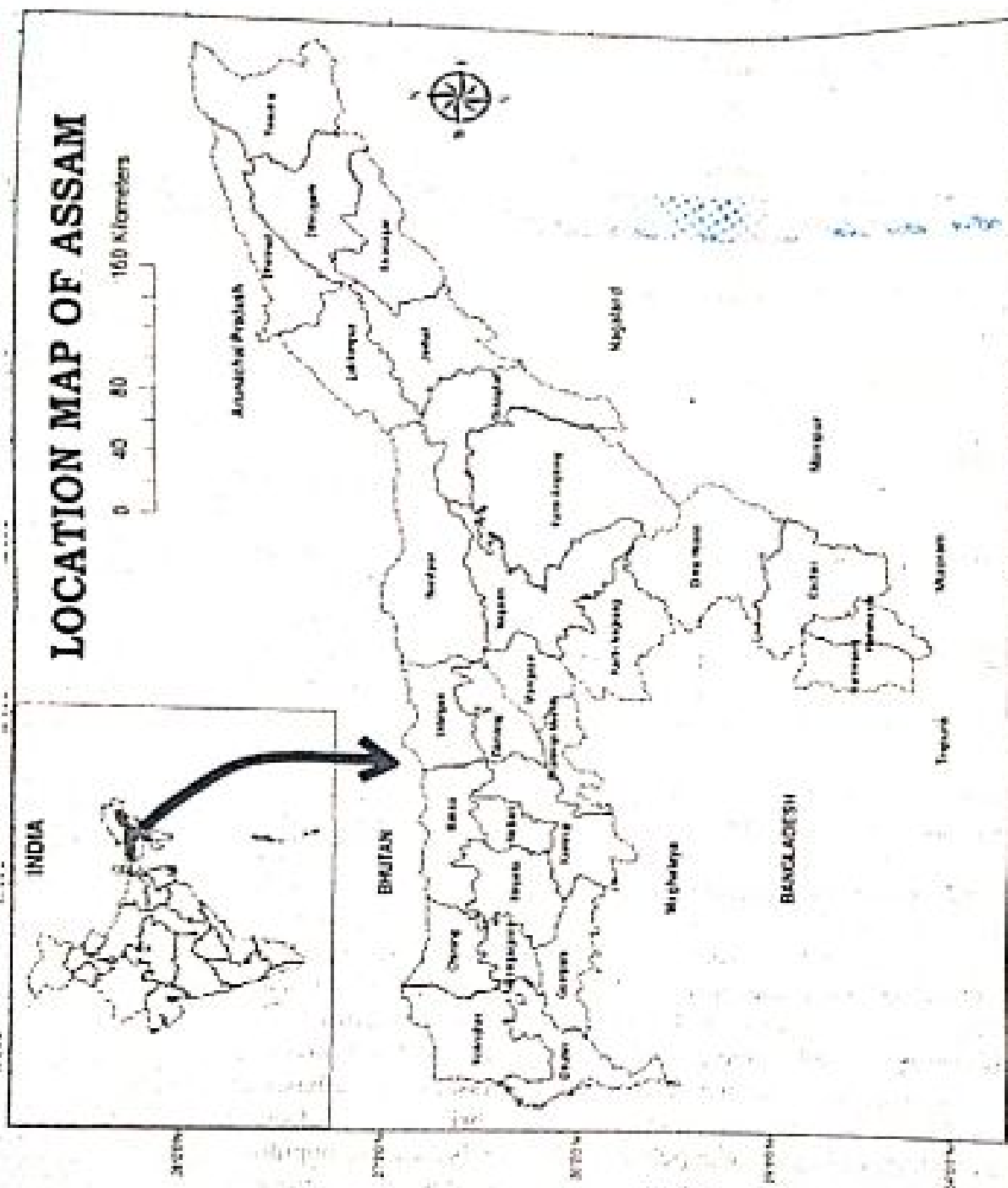
- Population and Settlements of Assam
- Ethnic and Linguistic diversity
- Transport System of Assam
- Resources of Assam : Types and Characteristics
- Crisis of Natural Resources
- Economy of Assam : Agriculture and Industries
- Problem and Prospect of Economic Development of Assam

### 4.1. Population and Settlement:

Assam is one of the important states of North-East India. Assam is bounded by seven Indian states and two foreign countries. Arunachal Pradesh state and foreign country Bhutan are on its north, Mizoram and Meghalaya on its south, Arunachal Pradesh, Nagaland and Manipur on its east and West Bengal, Tripura and foreign country Bangladesh on its west. It is important to note that Assam is linked with the state of West Bengal as well as the Indian landmass through a 50 km narrow land corridor on the west. In other words, the entire north-eastern region is connected with India through the narrow landmass of Assam and so, Assam is called the gateway of North-East India.

Assam extends from  $24^{\circ}09' \text{ N}$  to  $27^{\circ}58' \text{ N}$  latitudes and  $89^{\circ}42' \text{ E}$  to  $96^{\circ}01' \text{ E}$  longitudes (Fig. 4.1). It covers 2.4 per cent of India's total area, i.e., about  $78,438 \text{ km}^2$ . According to Census of India, 2011 about

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2.6 per cent population of India live in Assam. Total population of Assam is 312.05 lakh and out of which 159.39 lakh are male and 152.66 lakh female. Literacy rate in the state was 63.25 per cent in 2001 and it increased to 72.19 per cent in 2011 (Table 4.1). Sex ratio (number of female per 1000 male) indicates that in 2001 sex ratio was 935, which increased to 958 in 2011. This suggests that the rate of birth of female child has slightly increased in the state.

**Table 4.1 : Some Characteristics of Assam's Population (2001-2011).**

Population Characteristics	2001	2011
(a) Literacy rate (%)	63.25	72.19
(b) Sex ratio (No. of female per 1000 male)	935	958
(c) Rural population (%)	87.10	85.90
(d) Urban population (%)	12.90	14.09
(e) Scheduled caste population (%)	6.85	7.15
(f) Scheduled tribe population (%)	12.41	12.45

On the other hand, as per population data of 2001, about 87 per cent population of Assam lived in villages, which decreased to 85.90 per cent in 2011. Against this the urban population, however, increased from 12.90 per cent to 14.09 per cent during 2001-2011. So, it is clear that there is ongoing migration from village to town and due to which the percentage of people living in village has decreased while the same has increased in towns. On the other hand, the percentages of scheduled caste and scheduled tribe population have remained same in 2001 and 2011 indicating the almost same growth of population of the two groups during the period (Table 4.1).

As in the case of other states of India, the process of urbanization is still going on in Assam and the urban population has been increasing along with the number of towns. According to 2011 census, there are seven first class towns and six second class towns in the state. The list of these towns is presented in Table 4.2. Guwahati, the capital city of Assam with a population of 9,68,549, is the most populous urban centre of the state. Next to Guwahati, Silehar town of Barak Valley and Dibrugarh town of Upper Brahmaputra Valley have attained second and third position respectively among the seven first class towns of Assam on the basis of urban population size. On the other hand, Dhubri town of Lower Brahmaputra Valley having urban population of 65,756 is the most populous town among the six second class towns of Assam. Next to Dhubri the hill town Diphu occupies the position.

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Table 4.2 : Population of class-I and Class-II towns of Assam (2011).

Sr. No.	Town	Class of Towns	Population (2011)
1.	Guwahati	I	968,549
2.	Silchar	I	228,985
3.	Dibrugarh	I	154,019
4.	Jochai	I	153,249
5.	Nagavli	I	147,137
6.	Tirakia	I	125,637
7.	Tezpur	I	100,477
8.	Dubri	II	65,756
9.	Diphu	II	63,654
10.	North Lakhimpur	II	59,793
11.	Karimganj	II	57,585
12.	Sibsagar	II	55,595
13.	Goalpara	II	53,455

**Note :** According to Census, the towns with population of one lakh or more are regarded as class-I towns and the towns with population from 50 thousand to one lakh are regarded as Class-II towns.

#### 4.1.1. Trend of Population Growth :

Population is a dynamic entity. Alongwith population, its distribution and composition are also continuously changing. The growth and change of population takes place by three ways- birth rate, death rate and migration. Population is growing in all the countries and states of the world.

In a developing country like India the growth of population is generally high. Like the other states of India population is also increasing fast in Assam. The data on population growth in Assam from 1901 to 2011 are presented in Table 4.3.

According to the data of Table 4.3, Assam's population was 3,289,680 in 1901 which is 1.38 percent of India's population. Population of the state was gradually increasing in every decade since 1901 and it stood at 6,694,790 in 1941. It is noticed that Assam's population increased by more than two times during 1901-41. In 1941 its population was 2.10 percent of the country's total. Looking at the decadal growth rate it is seen that

**Table 4.3 : Trend of Population Growth in Assam (1901-2011).**

Years	Population	Percentage of India's Population	Decadal Growth Rate (in percentage)	Population Density (Population per km <sup>2</sup> )
1901	3,289,680	1.38	—	42
1911	3,848,617	1.52	16.99	49
1921	4,636,980	1.84	20.48	59
1931	5,560,371	1.99	19.90	71
1941	6,694,790	2.10	20.40	85
1951	8,028,865	2.22	19.93	102
1961	10,837,329	2.46	34.98	138
1971	14,625,152	2.66	34.95	186
1981*	18,041,248	2.64	23.36	230
1991	22,414,322	2.65	24.24	286
2001	26,655,528	2.59	18.92	340
2011	31,205,576	2.58	17.07	398

Note : In \*1981 no census was held, so in that year the population data mathematically calculated by the Census of India are given.

during 1901-11, the population growth rate was 16.99 percent. But after that, during 1911-21 the growth rate increased to 20.48 per cent. However, in the subsequent decades, the growth rate remained more or less same, such as 19.90 per cent in 1921-31, 20.40 per cent in 1931-41 and 19.93 per cent in 1941-51 (Table-4.3). But during post Independence period since 1951, the population of the state increased at faster rate. Especially, during the two decades 1951-61 and 1961-71, the growth rate of population increased to 34.98 per cent and 34.95 per cent respectively against that of the previous two decades. But, the growth of population declined slowly during the next decades which is evident from the tabulated data for the decades 1971-81, 1981-91, 1991-2001 and 2001-2011. This slow decline in population growth rate may be attributed to gradual decrease in birth rate and also the little control of migration from Bangladesh due to growing awareness of the public and the governments in recent years. Comparative data on decadal growth of population in Assam and India during 1901-2011 are presented in figure 4.2.

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DECADAL GROWTH OF POPULATION IN ASSAM AND INDIA, 1901-2011

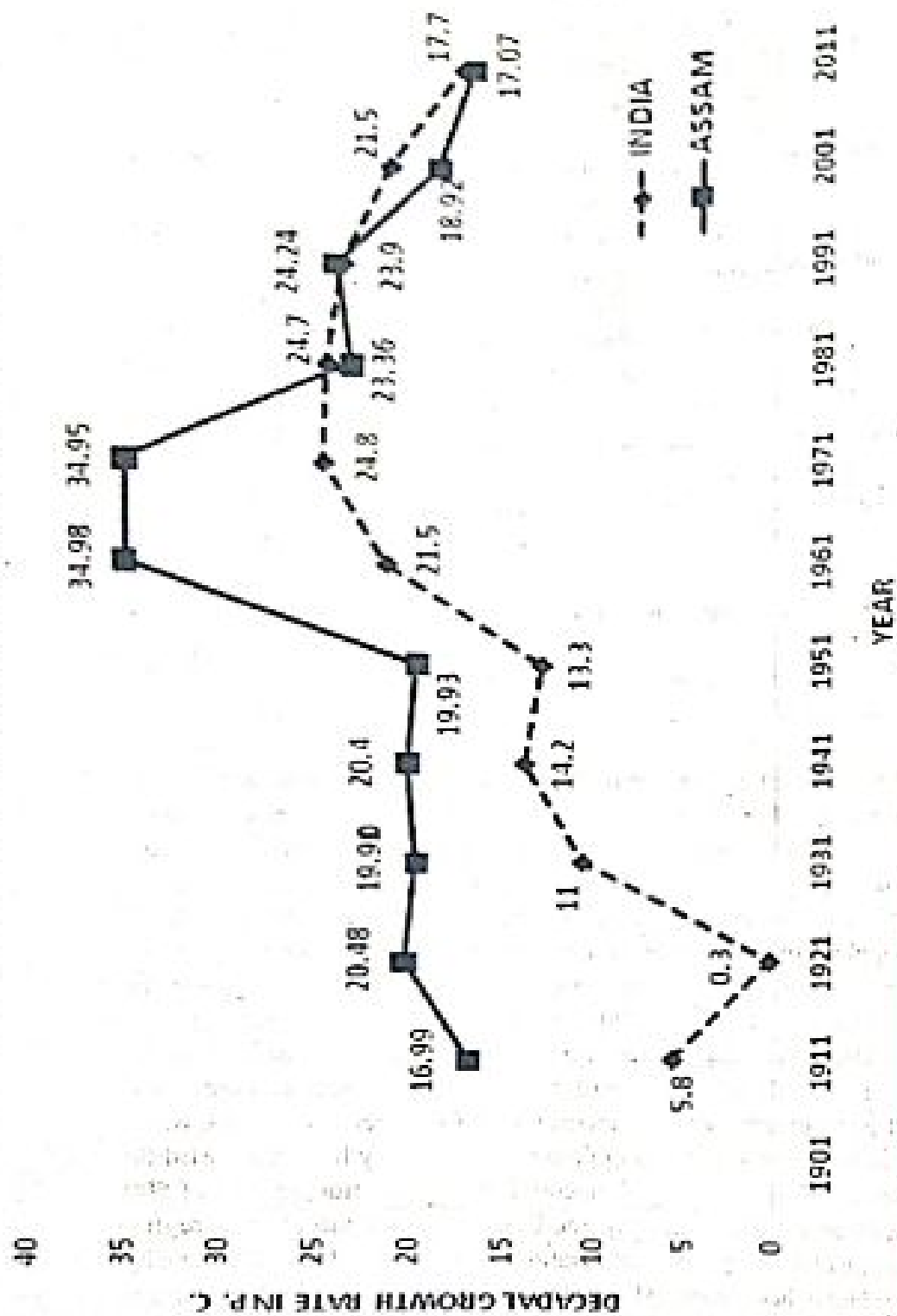


Fig. 4.2

### 4.1.2 Distribution of Population :

Besides population growth, another important aspect is population distribution. Looking at the population distribution pattern of the state, it is observed that distribution of population and settlements is not uniform in all the regions or places. In some regions population is more and its density is also more, while in other regions population is less and density is sparse. Generally, more settlements and population in a region indicate high density of population. Similarly, the sparse settlements and less population in a region indicate low density of population there. According to the census data (Table-4.3) the population density of Assam was only 42 persons per km<sup>2</sup> in 1901, i.e., during the beginning of the 20th century. As time passed, population density started to grow along with population increase and the same grew by two times in 1941 (85 person per km<sup>2</sup>) as compared to 1901. Just after the Independence, i.e., in 1951 the density of state population increased to 102 persons per km<sup>2</sup>. In the subsequent period, population density increased substantially. It is seen from the table-4.3 that population density was 286 in 1991, 340 in 2001 and 398 persons per km<sup>2</sup> in 2011.

Population distribution is not same in all the regions of the state depending on the varied physical environments prevalent in different regions. So, population density is also not same in all the regions. Generally, the regions having no favourable physical conditions, and developed economic and transport system have sparse settlements and less population. As against this, the regions have high population density where the favourable physical and economic conditions prevail. In table-4.4 the data on population and its density in the Brahmaputra and Barak Valleys and also the hill region of Assam during 2001 and 2011 are presented. In the Brahmaputra valley population is thick due to its plain land, fertile soils and favourable conditions for development of agriculture and transport. So, about 85 per cent of Assam's population live in the Brahmaputra Valley. Its population density was 1220 persons per km<sup>2</sup> in 2001 and this increased to 1302 persons per km<sup>2</sup> in 2011. The Upper Brahmaputra Valley region is inhabited by about 21 per cent of the population of the valley accounting for population density of 371 persons per km<sup>2</sup> according to 2011 census. On the other hand, about 27 per cent of the population of the valley live in the Middle Brahmaputra Valley region which accounts for population density of 500 persons per km<sup>2</sup> in 2011. Similarly, the Lower Brahmaputra Valley region is inhabited by about 36 per cent population of the valley. Population density is relatively higher here being 631 persons per km<sup>2</sup>. In the entire Brahmaputra

**Table 4.4 : Geographical region-wise population distribution in Assam (2001-2011)**

Regions	Area (Km <sup>2</sup> )	Percentage share of Assam's Total Area	Population		Percentage share of Assam's Total Population		Population Density (Persons per km <sup>2</sup> )	
			2001	2011	2001	2011	2001	2011
(A) Brahmaputra Valley	56,194	71.64	22658369	264110562	85.09	84.63	1220	1502
(1) Upper Brahmaputra Valley	21,706	27.67	5847045	6625840	(21.94)	(21.23)	327	377
(2) Middle Brahmaputra Valley	14,340	18.28	7722997	8532357	(27.09)	(27.34)	420	500
(3) Lower Brahmaputra Valley	20,148	25.69	9588327	11252365	(35.97)	(36.06)	473	631
(B) Barak Valley	6,922	8.82	2995769	3624599	11.24	11.62	440	545
(C) Hill Region	15,322	19.54	1801390	1170415	3.76	3.75	58	68
<b>Assam</b>	<b>78,438</b>	<b>100</b>	<b>26655528</b>	<b>31205576</b>	<b>100</b>	<b>100</b>	<b>340</b>	<b>398</b>

Source : Based of Census of India data.

Note : Figures in the brackets indicate percentage of population to the total population of the Brahmaputra Valley.



Valley of the state variation of population density in its upper, middle and lower parts is noticeable. Population density is higher in the middle region than that of the upper region and again it is higher in the lower region than that of the middle region of the valley. On the other hand, the Barak Valley happens to be densely populated due to its fertile alluvial plain with favourable conditions for transport and agricultural activities. According to 2011 census data, population density of the Barak valley is 545 persons per km<sup>2</sup> and about 11 per cent of Assam's population live in the valley. In contrary to this, the hill region comprising the districts of Karbi Anglong and Dima Hasao situated between the Brahmaputra and Barak Valley has sparse settlements and low population due to its inconvenient physiographic conditions. About 3.75 per cent of state population live in this hill zone and it represents the lowest population density as compared to other regions of the state. Density of population in the hill zone was only 38 persons per km<sup>2</sup> in 2001 and it increased slightly to 68 persons per km<sup>2</sup> in 2011.

District wise distribution and density of population in Assam are interesting. The population data (2001 and 2011) of the districts of Assam are presented in table 4.5. As the four districts – Chirang, Kamrup (Metro), Baksa and Udalguri were created after 2001, so their population data of that year are not given in the table. However, the data on population and area of other six districts such as Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darrang have changed due to creation of these four districts.

Among the districts of Assam, as per 2001 census data, the Kamrup district is the most populous district with 2,522,324 population and the Dima Hasao district is the least populous district with 1,88,079 population of the state. But, the Nagaon district with 2,826,006 population has become the most populous district of Assam in 2011 while the Dima Hasao district with 213,529 population was regarded as the least populous district in that year. In the case of population density data of 2001, the Nagaon district recorded highest density of population (583 persons per km<sup>2</sup>) and the Dima Hasao district recorded the lowest density of population (38 persons per km<sup>2</sup>) in the state. But, according to 2011 census data, the Kamrup (Metro) district has the highest density of population (2010 persons per km<sup>2</sup>). In this case, however the influence of high population concentration in Guwahati city is noteworthy. On the other hand, the Dima Hasao district has the lowest density of population (44 persons per km<sup>2</sup>) in the state. Population distribution pattern in the districts of the upper, middle and lower Brahmaputra Valley reflects that in 2011 among the districts of upper Brahmaputra Valley, Lakhimpur and Sibsagar districts have population density more than the average density of Assam (398 persons per km<sup>2</sup>).

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Table 4.5 : District-wise population of Assam (2001-11)

District	Population		Population Density (Persons per km <sup>2</sup> )	
	2001	2011	2001	2011
1. Dhubri	1637344	19,49,258	545	1171
2. * Kokrajhar	905764	8,87,142	256	280
3. * Bongaigaon	904835	7,38,804	420	425
4. Goalpara	822,035	10,08,183	451	553
5. * Barpeta	1647201	16,93,622	508	632
6. * Nalbari	1148824	7,71,639	509	763
7. * Kamrup	2522324	15,17,542	581	436
8. * Darrang	1504320	928500	432	491
9. Sonitpur	1681513	19,24,110	316	365
10. Lakhimpur	889,010	10,42,137	390	457
11. Dimaaji	571944	6,86,133	177	213
12. Morigaon	776,256	9,57,423	500	618
13. Nagaon	2,314,629	28,23,768	583	711
14. Golaghat	946,279	10,66,888	270	302
15. Jorhat	999,221	10,92,256	350	383
16. Sibsagar	1,051,736	11,51,050	394	431
17. Dibrugarh	1,185,072	13,26,335	351	393
18. Tinsukia	1,150,062	13,27,929	303	347
19. Karbi Anglong	813,311	9,56,313	78	93
20. Dima Hasao	188,079	2,14,102	38	44
21. Karimganj	1,007,976	12,28,686	557	673
22. Hailakandi	542,872	6,59,296	409	497
23. Cachar	1,444,921	17,36,617	382	459
24. Chirang	×	4,82,162	×	244
25. Kamrup (Metro)	×	12,53,938	×	2010
26. Baksa	×	9,50,075	×	475
27. Udalguri	×	8,31,668	×	497
Assam	2,66,55,528	3,12,05,576	340	398

**Note :** The four districts – Chirang, Kamrup(Metro), Baksa and Udalguri were created after 2001 and so their data are not given for 2001. As a result of creation of these districts, the population data of other six districts indicated by \*marks got changed. Further, six new districts like Biswanath, Charaideo, West Karbi Anglong, Hojai, Majuli and Mankachar have been formed during 2015-16.

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Again among the districts of the middle Brahmaputra Valley, Morigaon, Nagaon, Darrang and Udalguri districts have population density more than the state average. Similarly, among the districts of the lower Brahmaputra Valley, all the districts except Chirang and Kokrajhar districts, i.e., the districts of Dhubri, Bongaigaon, Goalpara, Barpeta, Nalbari, Baksa, Kamrup and Kamrup (Metro) have population density more than the state average. Again all the three districts of the Barak Valley, i.e., the districts of Karimganj, Hailakandi and Cachar have their population density more than the state average. The two districts of the hill region, i.e., Karbi Anglong and Dima Hasao district, on the other hand, have the lowest density of population and sparse settlements among all the districts of Assam during 2001 and 2011 (Figure-4.3).

#### 4.1.3. Causes of Population Growth:

Basically two causes are responsible for high population growth in Assam. One of these causes is the natural growth of population and the other is the large scale migration into the state from outside. But the contribution of migration towards population growth in the state is more than that of the natural growth. The natural growth of population, in fact depends on birth and death rates. The birth and death rates of Assam's population are not much different from the average rates of Indian population. This means that due to natural growth the population of Assam is growing almost at the same rate the India's population is growing. So, the high growth of population in Assam clearly suggests that if there was no large scale migration to Assam, the growth of Assam's population would have taken place at normal rate. Thus migration is regarded as the main cause of population growth in the state.

Although migration into Assam was continuous since the time when the Britishers took over India in 1826, it occurred at slower rate. But, migration had started actively from the beginning of the last century. During the time of partition in 1947 a large number of Hindu refugees migrated to Assam from the then East Pakistan (Now Bangladesh). Again the population of Assam increased rapidly during the post Independence period from 1951 to 2001. During this period the growth rate of Assam's population was 232 per cent against the national growth rate of 185 per cent. Such an abnormal growth of population in the state is due to unabated flow of migrants from Bangladesh. On the other hand, population has also increased slowly due to decrease in death rate caused through applications of modern

medical facilities. However, very recently it has been observed that the growth rate of population in the state has slightly declined. The main reasons behind this are the slowly decreasing birth rate and nominal check of migration from Bangladesh in recent years.

#### **4.1.4. Ethnic and Linguistic Diversity:**

Different ethnic and linguistic groups of people have been migrating to the North-East as well as Assam from its northern, eastern, southern and western sides since ancient times till today due to its peculiar geographical location. The charming natural environment, plentiful water resources, fertile soils of the river valleys, high rainfall and presence of varied species of plants and animals of Assam naturally attracted the migrants. Thus various groups of people migrated to Assam in different times. Presently, Assam is one of the states of India which is full of diversities. As the climate, physical environments and socio-economic condition vary from regions to regions, the state is the meeting place of multi-coloured cultures where religious, ethnic and linguistic variations among the people prevail. Such variations and diversities are the special characteristics of Assam and these have been immensely enriching the Assamese society and culture.

Each flow of migration to Assam taking place from different regions can be recognised as a human stream. The social scientists have the opinion that the first human stream migrated to Assam was probably the Austric group of people. They came from South-East Asia. The Khasis and Jaintias widely inhabited in Meghalaya state belong to this Austric group. Some of these people are found to live in the areas of Karbi Anglong and Dima Hasao bordering Meghalaya. Some Jaintia people also live in Cachar district along the Meghalaya border.

The second human stream coming to Assam after the Austric group was the Tibeto- Burman language speaking Mongoloid people. These people came across the Himalayas from Central Asia and settled in different parts of Assam. Almost all the tribes except the Khasis presently residing in Assam are basically of Mongoloid origin. The different tribes of Mongoloid living in the hills and plains of Assam mainly include the Bodo, Mishing, Rabha, Tiwa, Deori, Sonowal Kachari, Mech, Barmans of Cachar, Karbi, Dimasa Kachari, Garo, Kuki, Hmar, Hajong, Rengma Naga and Zeme Naga. Among these tribes the Bodo, Mishing, Rabha, Tiwa Deori, Sonowal Kachari, Mech and Barmans of Cachar are recognised as plain tribes, while the Karbi, Dimasa Kachari, Garo, Kuki, Hmar, Hajong, Rengma and Zeme Naga are recognised as

hill tribes. However, the Koch-Rajbongshis residing in Assam basically are of Mongoloid origin. The distribution of Mongoloid people in the state reveals that they generally live in the plains and near the river banks, foothills and hill slopes. Among all these tribes, the Bodos form the largest tribal group on the basis of population size. Although the Bodos are distributed more or less in all parts of the state, their concentrations are mainly confined to the north bank of the Brahmaputra, especially in Kokrajhar, Bongaigaon, Chirang, Baksa and Udalguri districts and the northern parts of Darrang and Sonitpur districts. On the basis of population size, the Mishing tribe is the second largest tribal group in Assam. The Mishings generally prefer to settle along the river side and they are mostly found in the riverine tracts of Lakhimpur, Dibrugarh, Sibsagar, Jorhat and Sonitpur districts. The Rabhas, in general have their scattered distribution in Assam. But they are concentrated mostly in Goalpara, Kamrup and Darrang districts. Tiwa (Lalung) are mostly concentrated in Morigaon and Nagaon districts of middle Assam and also in Sonapur region of Kamrup district, Dhemaji region of Dhemaji district and Titabor region of Jorhat district. The Deories are found mostly in Lakhimpur, Dibrugarh, Sibsagar and Jorhat districts. The Sonowal Kacharis are found to settle in Upper Assam region, especially in Dibrugarh, Lakhimpur, Dhemaji, Tinsukia, Jorhat and Golaghat districts. The Mech have their less population and they are confined to South Salmara of Goalpara district, Khewang of Dibrugarh district and Parokhowa of Karbi Anglong district. The Barmans of Cachar mostly live in the Barak Valley and some of them are scattered in Dima Hasao and Karbi Anglong districts. On the other hand, the whole Karbi Anglong district is the home of the Karbis. On the basis of population size, the Karbi tribe is the third largest tribe in Assam. Besides Karbi Anglong, some Karbi people are also found to live in Kamrup, Nagaon, Sonitpur and Dima Hasao districts. Similarly, besides living in the whole of Dima Hasao district, the Dimasas Kachari are also found in some parts of Karbi Anglong and Cachar district. The Garos have their settlements along the southern parts of Dhubri, Goalpara and Kamrup district bordering the Garo Hills of Meghalaya. The Kukis have settled in Dima Hasao district and they are one of the important tribes in the district from the point of their population size. The Hmar people are less in number and they are mostly confined to Dima Hasao district. The Hajongs mostly live in Karbi Anglong and Dima Hasao district. However, some settlements of the Hajongs are found in Goalpara district along the Meghalaya border. The

Rengma Naga people have their limited numbers as well as settlements. They are, especially found to settle in the hilly region between Chokihala in the north and Barpathar in the south of Karbi Anglong district. On the other hand, the Zeme Nagas have their settlements in north-easter part and south Mibong area of Dima Hasao district.

Most probably, the Indo-Aryan language speaking group of people migrated to Assam from the Gangetic Plain just after the flow of the Mongoloid people. They were originally of Caucasoid racial stock. First of all, they migrated to Assam under the patronage of the local kings or administrators and subsequently at their own and also being attracted by the economic resources of the Brahmaputra and Barak Valley they came to the state. This process of migration is still going on. Most of the non-tribal groups of people presently living in Assam belong to the Caucasoid stock. The Brahmins, Kayasthas, Kalitas, Nath-Jogis, Kacharis etc. are the people of this racial group which is represented by a large section of Hindu population of the state. These people have expanded their settlements in the Brahmaputra and Barak Valley and laid the foundation of Vaidic civilization and culture.

In the early part of 13th Century another group of Islamic people (soldiers) of Indo-Aryan origin came to Assam under Mahammad Bin Bakhtiar Khiliji, a Muslim General of Kutubuddin on their way to Tibet. In subsequent period, there were several invasions undertaken by the Muslim soldiers under the patronage of the Mogal kings of Northern India. In most of the invasions, some Muslim soldiers along with their fellow members having different skills were either kept as prisoners or engaged by the local kings and the people in various works. In this way, some muslims settled in Assam and they grew in numbers over time. Later on, they expanded their settlements gradually and established Muslim society and culture in the Brahmaputra and Barak Valley. Now, the Muslim community has emerged as one of the important ethnic groups in Assam.

Another important ethnic group who migrated to Assam was the Ahoms. The Ahoms basically belong to the Mongoloid stock. They came to Myanmar from China and then in 1228 under the leadership of Sen-Ka-Pha the Ahoms came across the Patkai hills from the Shan plateau of northern Myanmar. They settled first in upper Assam and established the Ahom kingdom. Later on, they brought almost the entire Brahmaputra Valley under their rule. The Ahoms ruled for about six hundred years and made substantial contributions to the society and culture of Assam. Presently, the Ahoms have their settlements mainly in Tinsukia, Dibrugarh,

Sibsagar, Jorhat, Golaghat, Lakhimpur and Dhemaji district of upper Assam region and also in Morigaon, Nagaon and Sonitpur district of middle Assam region.

The Koch-Rajbongshis are another notable ethnic group in Assam. Under the leadership of Koch king Bisva Singha, the Koches established kingdom on the western part of Assam and later on extended it upto the Barnadi of Lower Assam. After his death, his sons king Naranarayan and Chilarai became most powerful and expanded their kingdom from Lower Assam to Upper Assam. Gosain Kamal, brother of king Naranarayan took the lead to construct the 'Gohain Kamal Ali', a road extending from Koch Bihar to Narayanpur of Lakhimpur district, which still signifies the glory of the Koch kingdom. The contributions of the Koches to socio-cultural and religious fields of Assam are specially significant. Presently, the Koch-Rajbongshi people are found distributed mainly in the districts of Dhubri, Kokrajhar, Bongaigaon, Goalpara, Chirang, Barpeta, Nalbari, Kamrup, Baksa, Udalguri, Kamrup (Metro), Darrang, Morigaon, Nagaon, Sonitpur, Lakhimpur, Golaghat.

After the annexation of Assam by the British, the British needed some educated and skilled persons for carrying out their administrative, economic and commercial activities. For this purpose they brought some skilled persons from Bengal, Bihar, Uttar Pradesh, Rajasthan etc. Even some Nepali people were brought to be employed in military services. Subsequently many other Nepalis came to the State in search of livelihood. They engaged themselves mainly in agriculture and livestock rearing. Later on, when the British started tea cultivation in Assam, there was the need for labourers. But the local people of Assam did not show their interests to work in tea cultivation. So, the British brought the tribal people of Chotanagpur plateau of Central India to Assam to work in the tea gardens. These tribals are Austric in origin speaking the Mundari group of language. Now, these people are mostly concentrated in the tea cultivated districts of upper and middle Assam region. Tea tribes are one of the important ethnic groups of Assam. They have significantly contributed to the field of colourful cultures of Assam.

An important human stream to Assam was the migration of the landless Muslim peasants from the then East Bengal (Now Bangladesh). This migration continued from about the last decade of 19th century to just before the Independence. At first under the patronage of the landlords of the undivided Goalpara district and later on in the interests of the administrators the landless peasants of the East Bengal migrated to Assam and settled in the vast fertile lands and sparsely populated regions. Subsequently, a large number of Hindu refugees migrated from the then East Pakistan to India during partition at the time of Independence. Some of them also migrated to Assam and settled there. The migrated Muslim peasants occupied the river side fertile plains and floodplains, while the Hindu migrants selected and occupied the areas



near railway stations, market centres, towns and places convenient for business activities. It is a notable fact that the migration from Bangladesh is still continuing and the migrants mostly settle down in the floodplains and char areas of the Brahmaputra and Barak river. On the other hand, the internal migration process among the states of India is usually going on. This inter-state migration continues, especially due to social, economic and educational reasons. As a result of such migration, a large number of people have migrated to Assam from different states, mainly Rajasthan, Punjab, Bihar, West Bengal, Manipur etc. and they have also permanently settled here.

In this way as mentioned above, the people of various ethnic groups have been migrating to Assam from different places since ancient period to the present. As a result, the demography of Assam has largely changed. The state has now become a site of religious, linguistic, social, cultural, economic and occupational diversities. People of almost all major religions live in Assam. Here the Hindus, Muslims, Christians, Buddhists, Jains, Sikhs and people of different tribal religions live together. The Hindu population by number is highest in the state followed by the Muslim, Christian, Buddhist, Jain and Sikh population. According to the census of India, 1991 the Hindu population represented 67.13 per cent of the total state population. But, it came down to 64.91 per cent in 2001. On the other hand, the Muslim population accounted for 28.43 per cent of the total state population in 1991 and in 2001 it increased to 30.94 per cent. However, the Christian, Sikh and Jain population of the state are also increasing at slow rate. Looking at the linguistic composition of state population, it has been observed that Assamese and Bengali are the two major scheduled languages of Assam. Assamese is the state language. Assamese is the major language spoken in the Brahmaputra Valley, while Bengali is the major language spoken in the Barak Valley. According to census data the Assamese speaking population in the state had decreased during 1991-2001. In 1991 Assamese speaking population and Bengali speaking population were 57.29 per cent and 21.51 per cent respectively of the Assam's total population. But, the Assamese speaking population decreased to 53.08 per cent and the Bengali speaking population increased to 29.96 per cent in 2001. Besides the districts of the Barak Valley, the districts of the Brahmaputra Valley have also recorded increase of Bengali speaking population. On the other hand, the various tribal groups of Assam also have their own languages which are non-scheduled. Among these languages the major ones are the Bodo, Mishing, Karbi, Dima Hasao, Garo, Tiwa and Rabha. The tribals use their respective languages in their locality. Again in the towns and cities and commercial areas, Hindi is mostly used in speaking. As per census data the Hindi speaking population of the state had increased from 3.43 per cent to 6.40 per cent during 1991-2001. Besides, there are Nepali speaking people in the state accounting for 2.30 per cent of state total population. These people are scattered in different districts, but

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mostly concentrated in Sonitpur, Nagaon and Tinsukia district. In this way, Assam being the home of various linguistic groups represents prominent linguistic diversities.

## 4.2. Transport System:

Presently transport is an essential component of economic development. Besides, establishing communications and linkages among different regions, a good transport system helps in the exchange of resources, knowledge, culture and civilization. In addition to the creation of employment opportunities, a country may attain overall development through an efficient transport system. A well co-ordinated transport system covering land, water and air ways is the life line of a country. The development of economic sectors like agriculture, industry, commerce, communication etc. depends on efficient transport system. The transport system, besides in the economic sectors plays an important role in the development of social, cultural and political fields of a country. A well developed transport system strengthens national integration and unity amidst inequalities, variations and diversities prevalent in a country.

It has already been mentioned that Assam is the gateway of the North-East India. Through this gateway the states of North-East India are maintaining links with entire India. So, the economic development of North-East India is closely associated with the development of the transport system of Assam. Again, as Assam stands geographically at a distant location within India, the transport system has become one of the essential requisites for its economic development. The available transport systems of Assam are the road transport, rail transport, water transport and air transport. But there is more scope for development of these transport systems.

### 4.2.1. Road Transport :

Road transport is the oldest system of transport. It is convenient for movement of public and goods. It is more suitable for short distance. The road transport system has its significant role on the rural economy of Assam. The main advantages of road transport are (a) Road transport is convenient, fast and reliable, (b) It can easily make linkages and connections with the small and interior places, (c) It can nicely provide communications among the hills, plateaus and plains, (d) In transporting the agricultural and industrial products, road transport system is especially useful, (e) In the case of repairment, construction etc. The road transport system involves less expenditure as compared to some other transport systems, (f) Road transport system has directly helped in the development of tourism industry of the state by connecting the tourist spots by roads.

*Geography*

**Table 4.6 : Data of the Roads in Assam (Length in km.)**

Type of Road	Road Length (2007-08)	Road Length (2015-16)
1. Surfaced Roads (Excluding National Highways)	10,488	25,546
2. Unsurfaced Roads	24,458	19,316
3. National Highways	2,754	3,863
4. State Highways	3,134	2,530
5. Major District Roads	4,413	4,379
6. Rural Roads	26,221	36,544
7. Urban Roads	1,177	1,409

There are all total seven types of roads in the roads transport system of Assam, which are – Surfaced road, Unsurfaced road, National Highway, State Highway, Major district road, Rural road and Urban road. Taking all these roads together Assam has a total road length of 48,725 km in 2015-16. lengths of the roads are presented in Table-4.6 for the periods 2007-08 and 2015-16. It is seen from the table that the surfaced roads (Excluding National Highways) have been constructed in the state by about two and half times in length during 2007-08 and 2015-16. During the same period, the lengths of National Highways, rural roads and urban roads have been increased. But the lengths of unsurfaced roads have decreased indicating that some portions of these roads are converted to surfaced roads. However, the lengths of state roads and Major district roads have remained same (Table-4.6) suggesting no further construction of such roads.

The National Highways and other roads have their active role to play in the development of inland water transport systems of the state. Moreover, the National Highways have paved the way for development by connecting Assam and the other states of North-East India with the different states of the country. The National Highways falling in Assam are mentioned in Table-4.7.

#### **4.2.2. Railway Transport :**

Another major component of the transport system is the railways transport. The railway transport has substantially contributed towards the economic development of India. Presently, railway transport has

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Table-4.7 : The National Highways (N.H.) in Assam (2015-16)

Sl. No.	NH No.	Extension	Road Length (Km)
1	31	W.B. Border-Gouripur-North-Salmara-Bijni-Nalbari-Rangia-Chariali-Amingaon (NH-37)	307.75
2	31B	North Salmara - Abhayapuri - Jogighopa (NH-37)	19.66
3	31C	W.B. Border - Kochugaon - Sidi - Bijni (NH 31)	93.00
4	36	Nagaon - Dabaka - Amlakhi - Nagaland Border	154.20
5	37	Goalpara(NH-31B)-Paikan-Boko-Guwahati-Dispur-Sonapur-Raha-Nagaon-Bokaghat-Numaligarh-Jorhat-Jhangri-Sibsagar-Moranhati-Dibrugarh-Tinsukia-Makum-Saikhowaghat-Arunachal Pradesh Border	645.33
6	37A	Kuwari Tal (NH-37) - Tezpur (NH 52)	23.10
7	38	Makum - Ledo - Lekhapani	56.35
8	39	Numaligarh-Garampani-Naojan-Bokajan-Nagaland Border	105.78
9	44	Meghalaya Border-Badarpur-Karimganj-Patharkandi-Tripura Border	110.77
10	51	Paikan - Meghalaya Border	21.87
11	52	Baihata Chariali-Mangaldai-Dhekiajuli-Tezpur-Gohpur-Bander Dewa-North Lakhimpur-Dhemaji-Kulajan-Arunachal Pradesh Border	540.76
		Arunachal Pradesh Border - near- Saikhowaghat(NH-31)	9.23
12	52A	Gohpur - Arunachal Pradesh Border	
		Arunachal Pradesh Border - Bander Dewa	79.32
13	52B	Kulajan - Dibrugarh - Arunachal Pradesh Border	73.55
14	53	Badarpur (NH-44) - Schar-Lakhimpur-Manipur Border	321.37
15	54	Dabaka-Lumding-Langting-Hailong-Silchar-Dwarband-Mizoram Border	17.51
16	61	Jaji-Angun-Nagaland Border	8.60
17	62	Damara-Meghalaya Border	14.06
18	151	Karimganj-Bangladesh Border	38.00
19	152	Paracharkuchi-Hajua-Bhutan Border	21.70
20	153	Ledo-Lekhapana-Arunachal Pradesh Border	88.23
21	154	Dholeswari (Badarpur)-Bhairabhi-Mizoram Border	64.22
22	315A New	Arunachal Pradesh Border-Nahorkatia-Tinsukia (NH-37)	74.00
23	127B New	Srirampur-Dhuburi-Meghalaya Border	
24	127C (New)	Shyamthai-Hithijhar State PWD road starting from NH 27 in Chirang District, Assam and meeting at Galeghpu in Bhutan	40.00
25	127D (New)	Rangia-Darrangamela State PWD road starting from NH-27 in the district of Kamrup, Assam and meeting at Samdrupjunjhar in Bhutan.	48.60
	627New	Nelie (Amsol Gate)-NH-27 connecting Rajagaon, Doyangmukh, Umrangso, Khebak and terminating at NH-27 near Harangajao in the State of Assam	244.00
	427New	Howk on NH-27-Barpeta-Hajo-Jafukbari on NH-27	108.00
	329New	NH-29 near Manja connecting Diphu and terminating at its junction with new NH No. 27 near Lumding	54.60
	117A	NH-17 near Bilasipara connecting Kokrajhar and terminating at its junction with New NH-27 near Garubhasa in the State of Assam	47.00
	715A	NH-27 near Nakhola connecting Jagirbad, Marigaon, Kaupati, Rowla, Udaiguri, Kheirabari and terminating at Indo/Bhutan Border in the State of Assam	175.00
	127E	NH-27 near Barama connecting Baska, Subankhata and terminating at Indo/Bhutan border in the State of Assam	65.00
	702 New	Sonari-new NH-215 near Sapekhata in the State of Assam	32.00
	702C New	Sibsagar on NH-2 connecting Simalguri and terminating at its junction with new NH-702 at Sonari	48.00
	702D New	Nagaland Border-Mariani-Near-Jorhat	28.00

Source : Ministry of Road Transport and Highways, Govt. of India

Geography

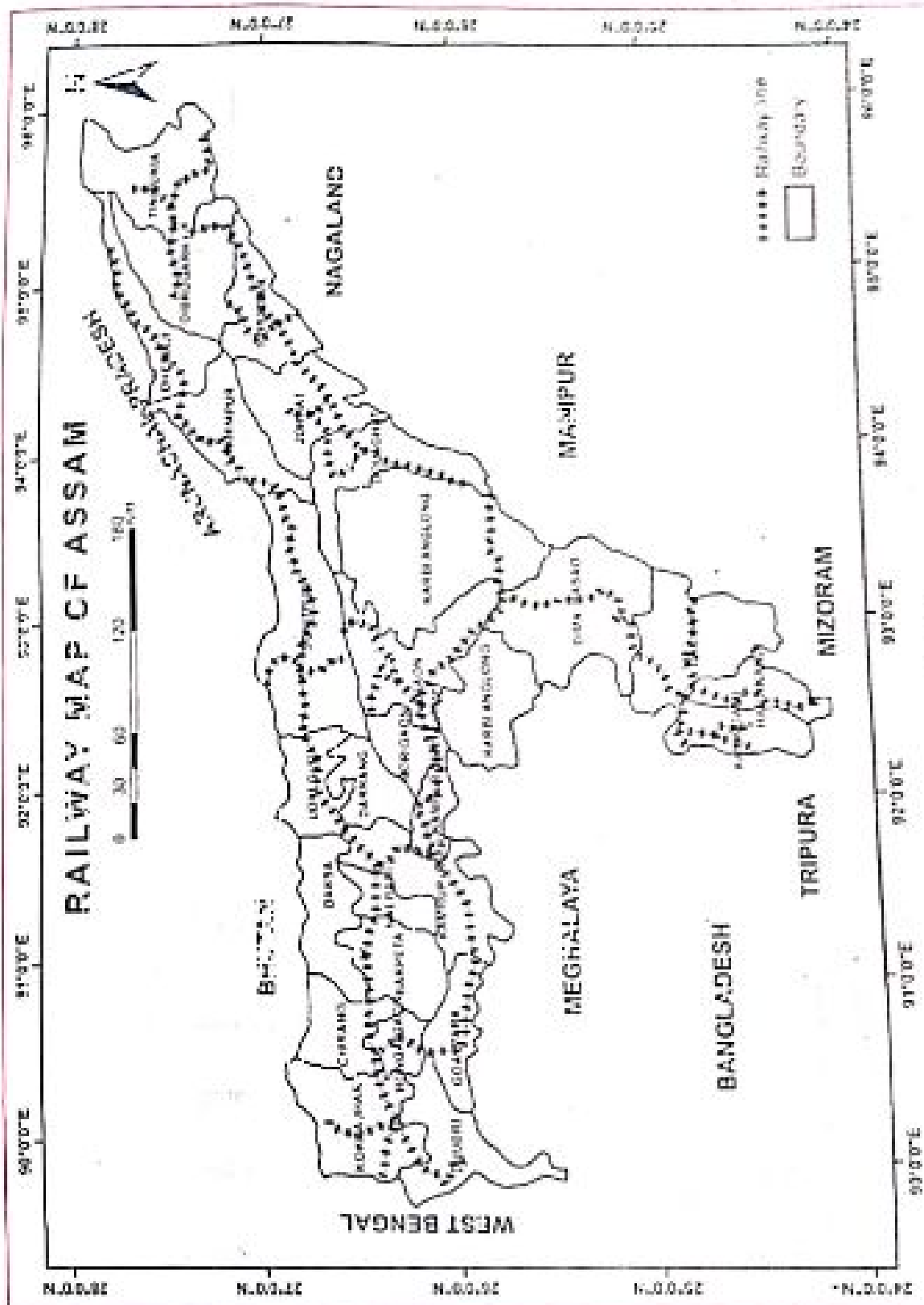


Fig. 4.4

gradually progressed in Assam and it has been able to influence the economy of the state. Like the road transport system, the railway transport system has also some advantages, such as (a) Railway transport is convenient and reliable in carrying passengers and goods for longer distance, (b) In the case of transport of necessary resources essential for infrastructural and industrial development along with the economic development of Assam, the railway transport system has been playing a vital role, (c) Employment opportunities are created due to expansion of railway transport in the state, (d) This transport system has enhanced national unity by connecting Assam with the distant states of the country and (e) Railway transport has become auxiliary to the development of road transport system.

The railway transport system of Assam comes under the railway zone known as North-East Frontier Railway. The Head Quarter of this zone is located at Maligaon, Guwahati. According to data available with the North-East Frontier Railway zone, the total length of rail lines in Assam was 2458.93 km during 2012-13. Out of this total length, Broad Gauge line extends for 1,470.06 km and Metre Gauge line extends for 988.87 km. Presently almost all the districts of Assam are connected by railways (Figure-4.4).

#### 4.2.3. Water Transport :

The water transport system of Assam is basically the inland water transport system. Assam is a land of rivers. The Brahmaputra and Barak river and their numerous tributaries, which account for 32 per cent of the total water resources of India are serving as the waterways of the state. The 891 km. long course of the Brahmaputra from Sadiya to Dhubri and 121 km. long course of the Barak are navigable. The navigable waterway of the Brahmaputra (891 km. long) was declared in 1988 as the second National Waterway of the country. This waterway has been contributing much to the economic development of entire North-East India including Assam. On the other hand, the 121 km. long waterway of the Barak river extending from Lakhimpur to Bhanga was declared by the central government in 2013 as the 6th National Waterway of the country. This waterway is expected to be helpful in enhancing the economic development of the entire North-East India, especially Assam, Nagaland, Mizoram, Manipur, Tripura and Arunachal Pradesh by transporting goods through ships at cheaper rate. There are two government agencies which are engaged in promoting the water transport system of Assam. These two agencies are the

Central Inland Waterways Corporation and the Directorate of Inland Water Transport (IWT). The main responsibilities of these two agencies are the effective utilization of water resources in water transport, transportation of goods and passengers using waterways as the cheapest mode of transport, proper use of the waterways of the region on commercial basis etc. There are a number of river ports including Fardis along the Brahmaputra river. In addition to these, there are more than 40 pairs of ferry ghats on the Brahmaputra for transporting both passengers and cargo. At present, as many as 36 ferry services are operating on the river Barak, Brahmaputra and its tributaries under the three divisions of the Inland Water Transport. Besides, the IWT department has introduced 61 numbers of cargo cum passenger services in the state connecting the interior places where road communications are not available. Moreover, large number of ferry and bhoot-bhonty services of private owners are also operating under unorganised sector for transporting goods and passengers. The advantages of the inland water transport of Assam are (a) There are more scope and opportunities for expansion of the water transport system in Assam being a land of rivers, (b) Expenditure for fuel in water transport is less as compared to other modes of transport, (c) Water transport is more useful in transporting heavy goods, (d) The inland water transport has been serving for the transport of goods and passengers widely in the state, (e) Unlike the road transport, the water transport has no such problems of air pollution, (f) The water transport system has been extending help to the people of places backward in road communications for conveyance of goods and passengers, (g) During natural disasters, especially flood in the state the water transport plays an important role, (h) There are no problems like repairing, maintenance, road construction etc. in the case of water transport system, because the natural rivers and streams are used as waterways.

#### 4.2.4. Air Transport :

Air transport is an integral component of the modern transport system. At present the air transport sector of Assam has made some developments. Assam now stays connected with different places of India through air transport. The air transport of the state is in operation through the civil airports located at Guwahati, Tezpur, Imphal, Jorhagarh, North Lakhimpur and Silchar. In addition, one more civil airport located at Rupshi, Dhubri is lying closed for long time. All the major airlines under private sectors are operating regular flights to and from Guwahati.

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Besides these, some private companies and agencies are also operating helicopter services within the state or connecting the interior places of the states of North-East India.

The airport located at Borjhar (Guwahati) is known as the Lokapriya Gopinath Bordoloi International Airport. This is the only international airport in whole of North-East. The number of aircrafts, passengers and loads of cargo handled (at domestic and international level) in this airport are mentioned in table-4.8.

**Table-4.8 :Data on Air Services of the Lokapriya Gopinath Bordoloi International Airport, Guwahati.**

Year	Average Number of Flights Handled per day	Average Number of Passengers Handled per day	Average Cargo (Commercial) Handled per day (tonnes)
2009-10	72	4357	14.45
2010-11	74	5301	23.34
2011-12	77	6150	21.26
2012-13	74	5690	16.47

The data mentioned in the table 4.8 show that there is no noticeable difference in number of daily flights handled by the LGB International Airport during 2009-10 and 2012-13. But the number of passengers on daily average has increased by more than 1000 passengers during that period and during 2011-12 year there was the record of highest 6150 number of passengers on daily average basis. The cargo transported on commercial basis increased in subsequent years from 2009-10 and the highest amount of cargo was 23.34 tonnes on daily average basis transported during 2010-11.

#### **4.2.5. Problems of Transport Systems :**

Although Assam has some facilities of the modern transport system, it still remains backward in the transport sector as compared to some other regions of the country. The road, railway, water and air transport systems of the state have enhanced the internal growth of its economy by connecting the places of different locations. Besides connecting the villages with the towns and interior and backward regions with developed regions, the transport systems have also played role to increase production, expand market facilities and meet the basic needs for economic development. Although the transport system of the



state has contributed much, its development and expansion are still not upto the mark. Today many regions of Assam are deprived of the service of the modern transport system. Because, the entire transport system of the state is not properly and uniformly developed. The major problems of this are-

(a) It is really difficult to expand the transport system in Assam which is characterised by varied topographic features like hills, plateaus, plains, floodplains, wetlands etc.

(b) Assam is linked with the mainland of India through a narrow corridor on the west and this has caused difficulties in the expansion of transport network.

(c) In some areas the soil properties of Assam are not suitable for construction and maintenance of roads. Moreover, high rainfall during summer causes damage to the roads easily. Also, the roads get damaged within a short period as no suitable and modern technologies are applied in their construction.

(d) In the case of industrial development, Assam is still backward as compared to some other states of India. One of the major causes for this is the underdeveloped transport system of the state. But, the industrial development, on the other hand may encourage the development of the transport system.

(e) In spite of immense scope and potentiality for development of tourism industry in Assam, no proper measures are taken so far for its development. If due importance is given on the development of tourism industry of the state, it is sure that the transport sector will also flourish altogether.

(f) Due to lack of large market in the state the transport system has not developed. Assam has largely failed to be actively associated with the field of trade and commerce at inter-state as well as international level and consequently the infrastructure of transport system has not been developed.

(g) The national and foreign investment in the state shows a declining trend due to some social and political unrest arising out of ethnic, communal and insurgency problems emerging from time to time. As a result, the expansion of trade and commerce has become limited and the transport sector has suffered a lot.

(h) Although the transport system has developed quantitatively, its qualitative expansion is not upto the mark. Lack of operative and technical efficiency is usually noticed in the case of road, railway, water and air transport.

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(i) In order to achieve overall development of the transport system, there is the utmost need for proper transport co-ordination among the road, railway, water and air transport. But, lack of such co-ordination is commonly observed in the state.

(j) Rapid development of transport sector has not become possible in the state, because the schemes undertaken by the governments for development and expansion of transport system are not executed in time and in proper way.

### **4.3. Resources of Assam:**

#### **4.3.1. Types and Characteristics:**

Resources are those materials and substances present in our environment using which we meet our needs and desire. There are various kinds of resources in the environment and these can be classified into different types on the basis of their characteristics. Similarly, the resources of Assam can also be classified.

Resources are mainly of two types – Natural resources and Human and man-made resources. The natural resources are created in nature by the natural factors. Some natural resources are renewable while others are non-renewable. The resources which can be renewed or newly produced or filled up again are called renewable resources. Along with solar energy and air the resources like water, vegetations, wildlife etc. of Assam come under this category of resources. On the other hand, some resources have formed and are getting deposited beneath the earth's surface for long period of time. But, if such resources are used continuously, their deposits will be reduced and exhausted at one time and then these can not be refilled. These resources are called non-renewable resources. The mineral resources of Assam like coal, mineral oil, natural gas etc. belong to this category. Among the renewable and non-renewable resources, again some are biotic and some are abiotic resources. Vegetations, wildlife etc. are the biotic, while wind, water, minerals, soils etc. are the abiotic resources.

The other type of resources is the human and man-made resources. Man collects resources from nature. Again man creates resources. Man with his knowledge, intelligence, skills and efficiency creates resources for his suitable uses and these resources are called man-made resources. For example, man creates agricultural resources by using the land resources and also creates hydro-electric power resource by using the water resources. In order to utilize and mobilize the resources, man builds up necessary

infrastructure and different institutions, which also come under man-made resources. So, man is really a valuable resource which is called human resource. Man should be made efficient in terms of his education, knowledge and intelligence, art and skills etc. for the development of human resources.

As regards to economic development of Assam, both the natural and human resources are important. Because, Assam is highly rich in both the resource potentials. There are plenty of natural resources in Assam and still then Assam remains backward. Its natural resources are not properly utilised so far. In this regard, there is the need to improve necessary infrastructure and technology for acquisition, utilization and management of resources, which will be again created by man. Moreover, the large size of population of the state provides the basis for human resource development. Human resource can be developed only when the population of the state gets qualitatively enriched. The economic development of Assam is almost impossible without proper development of its natural and human resources.

#### 4.3.2. Natural Resources :

The natural resources of Assam are created under its favourable environmental conditions. As the natural environmental conditions vary from regions to regions, the natural resources also vary in terms of their types, characteristics and distributional patterns over the regions. Assam has a large varieties of natural resources and the major ones are land resources, forest resources, mineral resources and water resources.

Land resource is an essential resource for the biosphere. The biosphere sustains as land supports the plants and animals. Man performs all his activities on the land. We have been living on the land and carrying out all our economic activities like agriculture, industries, transport and commerce. Land is used by man for different purposes. But, the characteristics and qualities of land resources are not same in all regions. Looking at the land qualities of Assam, it has been found that Assam's lands are composed of four types of soils. These are (a) Alluvial soils of the plains, (b) Piedmont soils, (c) Hill soils and (d) Laterite soils. Among these the alluvial soils are important from the economic point of view. Alluvial soils are of two types— new alluvial soils and old alluvial soils. The new alluvial soils are found on the floodplains and river-side plains of the Brahmaputra and Barak rivers and their tributaries. This type of soil is suitable for cultivation of rice, jute, pulses and vegetables. On the other hand, the old alluvial soils are found on the relatively higher plains of the Brahmaputra and Barak

river. These soils are fertile and suitable mainly for rice and tea cultivation. Agricultural lands are not equally distributed in the state. As per data of 2009-10 about 35 per cent lands of the total lands of Assam were brought under cultivation.

Assam was very rich in forest resources before four-five decades from today. But subsequently the forest resources started decreasing fast due to rapid growth of population and human encroachment of the forest lands. However, Assam is still not so poor in forest resources as compared to some other states of the country. Various types of forests are found in the plains, plateaus and hills of Assam. These forests are (a) Tropical evergreen forest, (b) Tropical semi-evergreen forest, (c) Reverine forest, (d) Tropical moist deciduous forest and (e) Tropical dry deciduous forest. These forests are rich in biodiversity and these provide habitat for a large varieties of plant and animal species. In the forests valuable tall trees like Nahar, Bonchom, Cham, Sirish, Ou, Gandhsoroi, Amari, Agar, Poma, Simul, Khair etc. and short trees and grass vegetations such as Bamboo, Cane, Nal, Khagori, Birina, Tora, Koupat, Dhekia, Jhao, Kohua etc. are available. These plant resources supply bamboo, wood, firewood, thatch, vegetables, fruits, medicinal plants etc. to the people along with the raw materials necessary for preparing articles for their daily use. Bamboo is extensively found in the forests of Assam and it is one of the main forest resources of the state. The forests of Assam, especially the reserved forests are the habitats for a large variety of wild animals. Among these animals the world famous one-horned rhinos, elephants, tigers, bears, wild buffaloes, different kinds of deers, monkeys and reptiles are notable. The hill region comprising Karbi Anglong and Dima Hasao district has naturally more forests. The State Forest Report of India 2011 has revealed that Assam has a total forest area of 16,832 km<sup>2</sup> (including classified and unclassified forests) which is about 34 per cent of its total geographical area. Again 72 per cent of the total forest areas of the state fall under the reserved forests. At present there are 5 national parks including Kaziranga and 20 wildlife sanctuaries including 2 proposed sanctuaries in the state.

Assam is rich in mineral resources. But, these are not suitably exploited due to their disadvantageous locations and adverse natural environment. The major minerals of Assam are coal, mineral oil, natural gas and limestones. As regards production it is observed that production of natural gas had increased a little during 2009-10 and 2010-11, while

the production of coal, oil and limestone declined slightly during the same period. Assam is also rich in mineral oil which is known as liquid gold. In Assam oil exploration was first done in Digboi the Digboi oil field is the oldest oil field in India. Besides Digboi and other major oil fields of the state are the Naharkatia, Mora-Hugrijan, Rudrasagar, Lakoa, Geleki, Borhola and Amaguri oil fields. In addition to oil, Assam is also rich in natural gas. Generally natural gas is found in most of the oil producing areas. But the major reserves of natural gas are found in Rudrasagar, Moran, Lakoa and Naharkatia oil fields. Assam produces about 25 per cent of India's total production of natural gas.

Coal is another important mineral resources of Assam. Assam's coal contains more sulphur. Coal is mainly used as a fuel for local rail and water transport and also for generating electricity. Coal is found in Makum region of Tinsukia district, Dilly-Jaipur region under Dibrugarh and Silsagar district, Charaipung-Tarajan region of Tinsukia district, Koliajan and Silbhetta region of Karbi Anglong district, Umrangchu and Garampani regions of Dima Hasao district. Moreover, coal is also found in Singimari area of Dhubri district. Limestone is another important mineral of Assam. Besides using it in producing cement and iron and steel, it is also used as raw materials in some chemical industries. Limestone is found in the two hill districts of Assam. Its deposits are localised in Koliajan-Manza region, Dilai hill, Silbhetta region and eastern part of Bokajan of Karbi Anglong district and also at Panimur, Garampani, Tumbung and Umrangchu regions of Dima Hasao district. The other minerals found in Assam include iron ore, feldspar, quartz and clay mineral. Iron ore of Assam has low iron content and hence its exploitation is not economically viable. Iron ore is found in Chandardinga, Lengupara and Kumri region of Goalpara district. Feldspar is found in little amount at Hahim area of Kamrup district. Similarly, quartz is found in Jajuri hill, Borhola, Chapanala and western part of Karbi Anglong district. Again several types of clay mineral are extensively found in Assam. Among these the china clay is found in Silbhetta, Silonijan and Deopani region of Karbi Anglong district and Fuller's clay is found at Subankhata on the bank of Pagladia river and also in Bhutan Khuti region of Nalbari district.

The North-East India including Assam is rich in water resources. Assam has plenty of surface and ground water resources. High rainfall, perennial water flows of the rivers, water of the ponds, marshes, wetlands etc. have all enriched the surface water resource of the state. The Brahmaputra and Barak- the two main rivers and their tributaries of the

state altogether carry about one-third of the water resources of the country. Besides some large and small marshes and pits Assam has more than three thousand wetlands. Various types of fishes and different species of aquatic plants are found in these wetlands and marshy lands. The surface water, especially the water of the rivers are utilized in the industrial and transport sectors in addition to agricultural and domestic uses. The ground water resources are also abundant in the Brahmaputra and Barak Valleys. In the plains the underground water level exists within a range of 5 metre from the surface. Like the surface water, the underground water resources are also used in agricultural, industrial and domestic purposes. In spite of plenty of surface as well as groundwater resources in the state, these are not yet tapped and utilized at desired level.

#### 4.3.3. Human Resources :

It is a fact that the fast growing population has become a burden of the state. Population problem has created many problems of the state. If the population problem is not controlled and the large population can't be developed as human resources, the population problem will assume serious dimension. Assam's population as per 2011 census is about 31 million and this accounts for 2.58 per cent of the total population of the country. Overall literacy rate of the state is 73 per cent and the male and female literacy rates are 78 per cent and 67 per cent respectively. Again rural and urban literacy rates are 70 per cent and 88 per cent respectively. Looking at the age-wise population structure, it is seen that the population of India as well as Assam is not ageing as in the case of Japan or China. Importantly about 35 per cent or more than 10 million people of Assam are in the age group from 15 to 34 years. It is certainly good that the youth is dominating the Assam's population. The youth in the age group between 15 years and 34 years represents a major portion (more than one-third) of the state population. This youth force should be made efficient in education, intelligence, technical know-how etc. through proper management. Besides, the weaker sections of the people, especially the poor communities, differently disabled persons and woman should be empowered and only then human resource development is possible in the true sense. It is the time to plan about how the large population of the state can be developed to human resource before being the burden for the state. Now, this is the great challenge before all of us.

#### 4.3.4 Crisis of Natural Resources :

Natural resources are essential for sustaining the existence of mankind as well as standard of living. There is, in fact a misconception among us that natural resource is the free gift of nature. With such misconception in mind man haphazardly uses the natural resources. As a result, three major problems arise, such as (a) Resources get polluted and damaged, (b) Resources become scarce and (c) Severe environmental and socio-economic problems arise. The natural resources are degraded not only by human factors, but also by natural factors.

The natural resources of Assam are now not so protected. The resources are getting degraded day by day. At present the human-induced factors have become more active and influential than the natural factors. Population of Assam has increased at faster rate during last few decades. As a result, pressure of population on natural environment is increasing. Growth of population has led to expansion of human settlements and increase in foodcrop production. Man has started to settle by clearing forests and also filling up the wetlands etc. Moreover, fertile alluvial agricultural lands are being used for human settlements. In this way the valuable resources like the forest areas, marshy lands, wetlands, agricultural lands etc. are gradually decreasing due to expansion of human settlements. Land use pattern has changed under population pressure on land and land has been put to some misuses. Because of this, problems like land erosion, loss of land fertility, soil pollution etc. are created. Again, the agricultural lands are needed as emphasis is given to increase foodcrop production due to increasing population. But, the agricultural lands go on decreasing as these are also used for human settlements. So, man has expanded agricultural activities by converting the forest lands and wetlands into agricultural lands. Moreover, the natural properties of cropland soils are lost due to use of high amount of chemical fertilizers with the purpose to increase crop production.

Like the land resources, the forest resources of the state are also affected by human activities. If the on-going forest destruction process is not checked by now, the forest resources of the state will soon disappear. Massive environmental problems would emerge if the forests become insufficient to maintain the ecological balance in the state. Similarly, the mineral resources are being increasingly used especially for the development of the transport, industry and energy sector and one day these non renewable resources would be certainly exhausted.

Presently the dimension of man's economic activities has increased. The processes of urbanization and industrialisation in the state have progressed gradually and there are some direct and indirect impacts of these process on the natural resources. If urbanization and industrialisation continue without proper planning, the air, water and land resources will be polluted. Now it has been realised that natural resources of the state should be utilized properly and rationally and for this, resource planning is very essential. Misuse of resources should be checked by conserving them through proper planning and only then the overall development of the state can be achieved.

#### 4.4. Economy of Assam:

##### 4.4.1. Agriculture :

Assam is an agricultural state. Majority of its people (about 75 per cent) are engaged in agricultural activities. Agriculture is the foundation of Assam's economy and the agricultural sector is the main driving force of its economy. The agricultural sector has been playing an important role in the development of state economy. More than 53 per cent of the working population of Assam are directly or indirectly engaged in the agricultural sector.

According to the Agricultural Census, Assam a total of 28.11 lakh hectares of lands were cultivated in Assam during 2010-11, which is about 88 per cent of the total land available for cultivation. Like in the other states of India, the majority of the farmers of Assam cultivate on small plots of land. About 85 per cent of the farmers of the state are small and marginal farmers.

Amount of rainfall and temperature, soil types and topographical characteristics are not same in all places of Assam. As a result, there are variations in crop varieties, production, methods of agriculture etc. over the regions. Therefore, the whole of Assam has been divided into six agro-climatic zones based on variation in soil types and properties, topographical characteristics, and rainfall and temperature distribution over the state. These zones are (1) Lower Brahmaputra Valley Zone, (2) North Bank Plain Zone, (3) Central Brahmaputra Valley Zone, (4) Upper Brahmaputra Valley Zone, (5) Barak Valley Zone and (6) Hill Zone (Table-4.9). The Lower Brahmaputra Valley Zone comprising ten districts including Kamrup has 9.30 lakh hectares cultivated land and out of this 4.69 lakh hectares (50.43%) of areas are sown more than once. In the North Bank Plain Zone covering five districts including Darrang, about 5.37 lakh hectares of lands are



Table-4.9 : Agro-climatic Zone-wise distribution of Agricultural lands in Assam (2019-11)

Sr. No.	Agro-climatic Zones	Districts covered	Net Cropped Area (Lakh hectares)	Area Shown More Than One (Lakh hectares)
1	Lower Brahmaputra Valley Zone	Kamrup, Kamrup-Metro, Nalbari, Baksa, Bongaigaon, Chirang, Kokrajhar, Dibrui, Goalpara	9.39	4.69 (50.43%)
2	North Barak Plain Zone	Darrang, Udalguri, Sonitpur, Lakhimpur, Dhemaji	5.37	3.36 (62.57%)
3	Central Brahmaputra Valley Zone	Nagaven, Morangon	3.28	0.86 (26.21%)
4	Upper Brahmaputra Valley Zone	Tinsukia, Dibrugarh, Sibsagar, Jorhat, Golaghat	6.20	1.94 (31.29%)
5	Barak Valley Zone	Cachar, Karimganj, Hailakandi	2.42	1.02 (42.15%)
6	Hill Zone	East Janglong, Dima Hasao	1.34	1.01 (85.58%)
	Assam		28.00	12.88 (45.82%)

cultivated out of which 3.36 lakh hectares of lands (62.57%) are used for raising more than one crop. Similarly, the Central and Upper Brahmaputra Valley Zone have respectively 3.28 lakh and 6.20 lakh hectares of cultivated lands. Out of these 0.86 lakh hectares (26.21%) of lands in the Central Zone and 1.94 lakh hectares (31.29%) of lands in the Upper Zone are used for sowing more than once. In the Barak Valley Zone covering Cachar, Karimganj and Hailakandi district, all total 2.42 lakh hectares of lands are cultivated out of which 1.02 lakh hectares of land (42.15%) are used to grow more than one crop. On the other hand, the Hill Zone comprising Karbi Anglong and Dima Hasao district has all total 1.54 lakh hectares of cultivated land where the area sown more than once covers about 1.01 lakh hectares of lands (65.58%). In Assam as a whole, total cultivated area (Net Cropped Area) amounts to 28.11 lakh hectares during 2010-11 out of which the area sown more than once is 12.88 lakh hectares (45.82%).

Rice is the principal crop in Assam. Rice is cultivated in all the agro-climatic zones, i.e. all the districts of the state. As shown in the table 4.10 rice was cultivated in an area of 25.45 lakh hectares during 2011-12 and about 50.45 lakh metricktonnes of rice were produced. Three types of rice are cultivated in Assam, such as Autumn rice, Winter rice, and Summer rice. Among these the winter rice (sali rice) is extensively cultivated. It is cultivated in about 70 per cent areas of the total rice growing areas of Assam. Winter rice grows well in the fertile alluvial soils of the Brahmaputra and Barak Valley. Using plantation method this rice is cultivated during July-August and crops are harvested during November-December. Autumn rice is cultivated in the fertile soils of the plains and it is extensively cultivated, especially in the lower parts of the Brahmaputra Valley. This type of rice is grown using both sowing and plantation methods. It is first cultivated during February-March and harvested during June-July. On the other hand, Summer rice (Bodo rice) is cultivated more or less in all the districts of Assam. This rice is grown generally in the low-lying areas during the winter months and harvested during the summer months of June-July just before flood comes. Since the Winter rice is usually damaged by flood every year, Summer rice cultivation has become more popular among the farmers living in the flood-affected regions.

Besides rice, the other principal foodcrops of the state are wheat, maize and different varieties of pulses. Blackgram, greengram, lentil, pea, arahar, gram etc. are the pulses which were cultivated in 1.32 lakh hectares of land during 2011-12 with a total production of 0.76 lakh metricktonnes

(Table-4.10). Again oilseeds like mustard, sesamum, linseed, castor etc. were grown in 2.76 lakh hectares of lands and a total of 1.56 lakh metric tonnes was produced. Among the other crops vegetables, potato, spices fruits, sugarcane and jute are the principal crops. Vegetables and fruits were cultivated respectively in 2.66 and 1.36 lakh hectares of lands. On the other hand, potato and spices were grown each in equal amount of lands (0.98 lakh hectares).

Jute has been extensively cultivated in Assam by the farmers migrated from East Pakistan (Now Bangladesh). It is cultivated mostly on the floodplains of the middle and lower Brahmaputra Valley. Presently jute cultivation has declined to some extent. Although jute was cultivated in 0.88 lakh hectares of lands during 1991-95, its cultivation came down to 0.66 lakh hectares during 2011-12.

The agro-climatic zones of Assam have their own characteristics. But the zones falling on the plains have more similarities in their agricultural patterns. Winter rice and jute are cultivated during summer period when monthly average rainfall is over 300 mm. Again rainfall decreases during winter with less than 10 mm of rainfall on monthly average basis and in this period mustard, wheat, potato and varieties of vegetables are grown. On the other hand, jhum cultivation is largely practised in the hill regions of the state. However, fruits are cultivated on

Table 4.10 Some Data on the Major Crops of Assam (2011-12).

Name of crop	Area Under Cultivation (Lakh Hectares)	Production (Lakh Metric tonnes)
(a) Rice	25.45	50.45
(b) Wheat, maize, millets, oilseed crops	0.65	0.68
(c) Pulses (Black gram, green gram, lentil, pea, arhar, gram etc.)	1.32	0.76
Total Food crops (a+b+c):	27.42	51.89
(d) Oil seeds (Mustard, sesamum, linseed, castor, etc.)	2.76	1.56
Other Major Crops:		
(e) Jute	0.66	1.09
(f) Sugarcane	0.28	10.53
(g) Fruits	1.36	17.14
(h) Spices	0.98	2.48
(i) Potato	0.98	6.83
(j) Vegetables	2.66	46.20

the suitable slopes of the hills, whereas rice cultivation is carried out in some narrow river-plains between the hills.

The agro-climatic zone in the hills of Assam covering Karbi Anglong and Dima Hasao hill district is chiefly characterised by jhum cultivation (shifting cultivation). About 66 per cent area of Karbi Anglong district and 85 per cent area of Dima Hasao are covered by hills. In these hills, jhum cultivation is practised, jhum cultivation spans over about 5452 km<sup>2</sup> area of Karbi Anglong district and 2597 km<sup>2</sup> area of Dima Hasao district. Generally, the tribal people carry out jhum cultivation with traditional methods by burning and clearing the forests on the suitable slopes of the hills. When soil fertility gets reduced after carrying out jhum cultivation on a plot of land for several years together, a new plot of land is selected for jhum cultivation. Jhum cultivation characterised by its shifting nature is very closely associated with the society, culture and living style of the hill tribes. Although this type of cultivation is a type of mixed agriculture, it fails to give good production. Some environmental problems like forest destruction, soil erosion, loss of soil fertility etc. have cropped up due to this method of cultivation. So, there arises a need for ecofriendly practice of jhum cultivation and more essentially efforts should be made to popularise the practice of terrace cultivation instead of jhum cultivation among the tribal people of the hills.

#### **4.4.2. Industries :**

We have already come to know that Assam is rich in natural resources. In spite of plenty of natural resources including valuable mineral resources, Assam is lagging behind in the industrial sector. Assam is still not successful in fostering the process of industrialization through proper utilization of the resources. However, presently some schemes have been introduced for industrial development of the state. In order to execute these schemes the Department of Industry and Commerce, Govt. of Assam and Assam Industrial Development Corporation are especially involved. The industrial development plans are undertaken on the basis of the industrial policies announced by the central and state governments from time to time. At present, due emphasis has been given on the development of the Small Scale Industrial Sector. In this sector, the employment generating manufacturing and processing industries are taken into account. The industrial development of the state will attain its pace only when the problems of industrial development, especially of the energy and

transport sector are removed. In this regard, it is observed that the environment of industrialization has been gradually improving in the state. During the period from 2001-06 to 2008-09 the annual growth of manufacturing industries and their contribution to state economy came down gradually. But since 2009-10, the growth of these industries and their contribution to the economy of the state started to increase.

Table-4.14 : The Industrial Parks and Centres Recently Set up in Assam.

Sl. No.	Industrial Parks/Centres	Location	District
1	Software Technology Park	Pospara	Kamrup (Metro)
2	Bio-Technology Park	H. C. Gogoi Bari	Kamrup (Rural)
3	Export Promotion Industrial Park (EPIP)	Amilagan	Kamrup (Rural)
4	Industrial Growth Centre (IGC)	Maina	Goalpara
5	Industrial Growth Centre (IGC)	Poligara	Gonepur
6	Integrated Infrastructure Development Centre (IIDC)	Dima Dinow	Sibsagar
7	Integrated Infrastructure Development Centre (IIDC)	Dalgawan	Barpeta
8	Integrated Infrastructure Development Centre (IIDC)	Malali	Nagaon
9	Integrated Infrastructure Development Centre (IIDC)	Melkhal	Cerhar
10	Integrated Infrastructure Development Centre (IIDC)	Tinkari	Jorhat
11	Integrated Infrastructure Development Centre (IIDC)	Tinopatra	Dimasaji
12	Integrated Infrastructure Development Centre (IIDC)	Malbari (Tilua)	Nalbari
13	Integrated Infrastructure Development Centre (IIDC)	Pathala, Kown	Barpeta
14	Integrated Infrastructure Development Centre (IIDC)	Moxan	Dibrugarh
15	Plastic Park	Chitapanbari	Tinsukia
16	Mega Food Park	Malbouni (Tilua)	Nalbari
17	Bamboo Technology Park	Chaugyan	Kamrup (Rural)
18	Jute Park	Phing	Nagaon
19	Tea Park	Chaugyan	Kamrup (Rural)

The Government of India has announced some schemes for industrial development in Assam as well as North-East India. In this regard, the North-East Industrial Investment Promotion Policy announced in 2007 is noteworthy. As a complimentary to this policy, the Government of Assam has also undertaken some industrial schemes by announcing the State Industrial Policy in 2008. Presently, as many as 64 commercial estates and 50 industrial estates/areas have been established in different districts of Assam under the central and state industrial policies. Two industrial growth centres are established at Balipara of Sonitpur district and Matia of Goalpara district. Again altogether 9 Integrated Infrastructure Development Centres are set up at Silapathar (Dhemaji), Dalgaoon (Darrang), Pathasala (Barpeta), Malinibil (Cachar), Demow (Sivasagar), Naltoli-Bhomoraguri (Nagaon), Titabor (Jorhat), Tihu (Nalbari) and Moran (Dibrugarh). Moreover, some industrial parks and industrial centres are also recently set up (Table 4.11).

After reviewing the State Industrial Policy of 2008, the Government of Assam has announced the Industrial and Investment Policy, Assam in 2014 for industrial development of the state. The principal aims of this recently announced state industrial policy are as follows :

- (a) To increase the Gross Domestic Product of the state by developing the manufacturing and service sectors alongwith various economic activities.
- (b) To increase the per capita income and employment opportunities in the state, especially in the rural areas.
- (c) To encourage and increase investment for the development of micro, small and medium industries.
- (d) To create large number of skilled personnel.

The industries of Assam can be broadly divided into five types, such as- (1) Mining industries, (2) Handicraft industries, (3) Agro-based industries, (4) Power industries and (5) Service sector industries. The major industries under each of these five types are mentioned in table-4.12. However, all these industries are not discussed here. The agro-based industries including tea industry and also the fishery and oil industries are described briefly.

**Agro-based Industries :** Varieties of food crops and cash crops are produced in Assam due to its climate and soils suitable for agriculture. There is immense scope for setting up different industries in Assam using the

**Table-4.12 : Major Types of Industries of Assam.**

Types of Industries	Major Industries
(1) Mining Industries	Oil and natural gas industry, coal industry, limestone industry etc.
(2) Handicraft Industries	Handloom and textile industry, bamboo-cane industry, brass and bell metal industry, pottery industry etc.
(3) Agro-based and Allied Industries	Forestry, tea industry, silk industry, rubber industry, food processing industry, paper industry, Allied industries- fishery, animal husbandary etc.
(4) Power Industries	Hydropower industry, oil-coal-gas based energy industry etc.
(5) Service Sector Industries	Trade, transport and communication, tourism industry, hotel business, banking and insurance services, all types of business, public administration etc.

agricultural products as raw materials. In this regard, some agro-based industries have come up. At present the major agro-based industries of the state are forestry, tea industry, silk industry, rubber industry, food processing industry and paper industry.

Food processing industry is a major type of agro-based industry. Recently this industry has gained importance and it is expected to put a positive impact on the state economy within a short period of time. The forests of Assam are full of various forest resources and the industries like paper, plywoods etc. have already grown up based on these forest resources. But, the various types of fruits, vegetable plants and medicinal plants found in the forests of Assam are not so far collected and utilized on commercial basis. However, some agro-based industries are now set up based on the fruits and vegetables produced in the rural areas of Assam. Among these, the food parks established at Chhaygaon and Nathkuchi (Tihu) are notable.

Silk industry is one of the major agro-based industries of the state. Traditionally three kinds of silks are produced in Assam - Eri, Muga and Mulberry yarn (Pat). These three silk types have occupied unique position in Assamese culture and society. The Eri, Muga and Pat cloths prepared from these silks have received popularity not in India but also in different countries of the world. Assam is one of the major Eri producing states accounting for about 65 per cent production of the country. But, the production of Mulberry yarn is not so high in the state. On the other hand, Assam has become world famous in the production of Muga

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yarn commonly known as 'Golden Silk'. More than 97 per cent Muga yarn of India is produced in Assam. Alongwith substantial production of silk, its associated handloom industries have also developed in the state. At present, there are more than 13 lakh looms in Assam and about 25 lakhs people are directly or indirectly associated with weaving industry.

Rubber industry is an another important agro-based industry of Assam. Next to tea plantation, rubber plantation has now become popular in the state. The Rubber Board of India has identified Assam as a most prospective state for rubber plantation based on its suitable climate. Rubber was planted on about 16.5 thousand hectares of land during 2006-07. But, during 2012-13 the plantation area was increased by more than two times to 34.5 thousand hectares of land. In view of more prospect for rubber production in the state, the Rubber Board of India has taken scheme to extend the rubber plantation area upto 2 lakh hectares by the end of the 12th five-year plan.

Tea industry is the largest agro-based industry of the state. Assam has earned a good name in tea industry not only in India but also in the world. This industry plays an important role in state economy (Fig. 4.5). Assam alone produces more than half of the total tea production of India. Tea industry in Assam has flourished due to luxuriant growth of tea under favourable climatic conditions. Assam has a total of 765 tea estates and also 78,091 small tea gardens with area less than 10.12 hectares as per data of 2012. Tea is cultivated in Assam in a total of 318 thousand hectares of land. About 500 thousand tonnes of tea were produced in 2009 and it increased to 590 thousand tonnes in 2012 (Table 4.13). A large number of people are now employed in tea industry. More than 6.86 lakhs people are engaged on daily average in the tea industry

**Table-4.13 : Comparative Data on Tea Production in Assam and India**

Years	Total Tea Production (tonnes)		Assam's Share of India's Total Production (%)
	India	Assam	
2001	853923	453587	51.95
2005	945974	487487	51.53
2009	978999	499997	51.07
2012	1111760	590120	53.08
2013	1208780	629050	52.04
2014	1207310	610970	50.61
2015	1208660	526185	43.53
2016	1237360	669500	54.11



of Assam. According to another source of the Tea Board of India, the small tea growers of the state now cultivate tea in about 88 thousand hectares of land and produce about 107 thousand tonnes of tea. The leading position of Assam in tea production in India is evident from the Table 4.13. Assam has earned the glory of producing above 50 percent of the total tea production of India during 2001-2016 only excluding the year 2015 (Table 4.13).

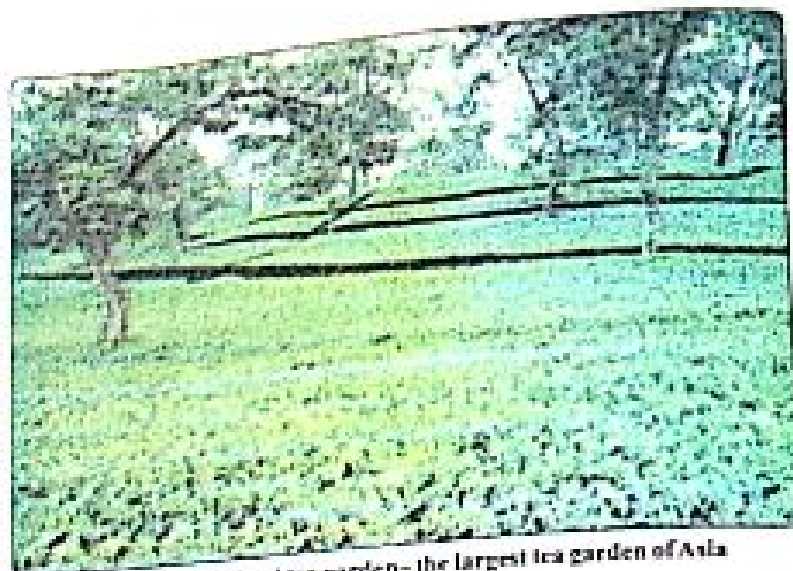


Fig. 4.5: Monabari tea garden – the largest tea garden of Assam

**Fishery :** Agricultural sector has its notable contributions towards economic development of Assam. The extent of agricultural activities is vast and the fishery and animal husbandary may also be included within it. Presently, fishery is gradually gaining importance in the economic sector of Assam (Fig. 4.6). There is immense prospect for fishery development in the state. Assam is a state full of rivers and tributaries. Fishes are found in its rivers, wetlands, abandoned channels, marshes, waterbodies etc. Plenty of fishes are naturally available in the wetlands of the Barak and Brahmaputra plains and floodplains. Fish production can be increased by multiplying fish population in these wetlands through scientific methods and plans. In spite of more demand for fish and more scope for fish production in the state, the vast wetlands and waterbodies are not properly utilized for producing fishes. As per 2011-12s data, there are 430 government registered wetlands in the state covering about 60 thousand hectare areas. Again, there are another 767 non-registered wetlands covering a total of 40 thousand hectare of area. In addition to these wetlands, a large number of tanks, marshylands, waterbodies etc. are regarded as the fish producing grounds. During 2011-12 all total about 4490 million fish seeds were produced from 3.94 lakh hectare of fishing ground and in the same period 2.44 lakh tonnes of fishes were produced in the state. It is observed that production of fish seeds increased by 2.5 times and fish production increased only by 1.5 times during the last ten years. District-wise production pattern of fish seeds during 2011-12 reveals that Barpeta district is the highest producer of fish seeds in the state and Karimganj and Nagaon district have attained the second

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Fig. 4.6 : Fishyculture

tremendous prospects. At present, Assam imports about 0.20 lakh tonnes of fish annually from other states of the country. But, the amount of fish produced in the state as well as imported from outside is not sufficient to meet the domestic demand. As a result, there is an annual deficit of 0.52 lakh tonnes of fish in the state and so the price of fish has increased more and more.

**Oil Industry :** Assam is rich in oil resources. First exploration of oil production in the state started in 1889 at Digboi. Digboi is the oldest oil field of India (Fig. 4.7). When the oil fields of Western India did not produce oil, the Digboi oil field then earned the pride of producing three-fourth of the total oil production of the country. This oil field covering an area of about 13 km<sup>2</sup> supplies oil to the Digboi refinery. After Digboi, Naharkatia oil field was explored and oil production started from 1954. Annually 2.5 million tonnes of oil and one million cubic meter of natural gas are produced from this oil field. Oil from this field is transported to Noonmati Refinery of Guwahati and Barauni Refinery of Bihar through pipe lines. Oil production from the Moran-Hugrijan oil field was started from 1956. Moreover, oil is produced from the major oil fields like Rudrasagar, Lakowa, Geleki, Borhola and Amaguri.

Presently, there are four oil refineries in Assam. These are Digboi Refinery, Guwahati Refinery, Bongaigaon Refinery and Numaligarh Refinery. Digboi Refinery is the oldest of the country. It has its annual refining capacity of 0.7 million metrictonnes. Guwahati Refinery and Bongaigaon Refinery have their annual refining capacity of 1 million metrictonnes and 2.4 million metrictonnes of oil respectively. On the other hand, Numaligarh Refinery has its annual refining capacity of 3 million metrictonnes of oil. Assam produced about 4.86 million metrictonnes of crude oil and 2681 million cubicmeter of natural gas in 2012-13. But, these productions were somewhat less than that of

and third position respectively. Similarly, Nagaon district ranks first in fish production is the state during the year, while Cachar and Dhubri district occupy the second and the third position respectively.

The fishery sector nominally contributes to the state domestic products, which is only two per cent. Fish production in the state is not satisfactory in spite of

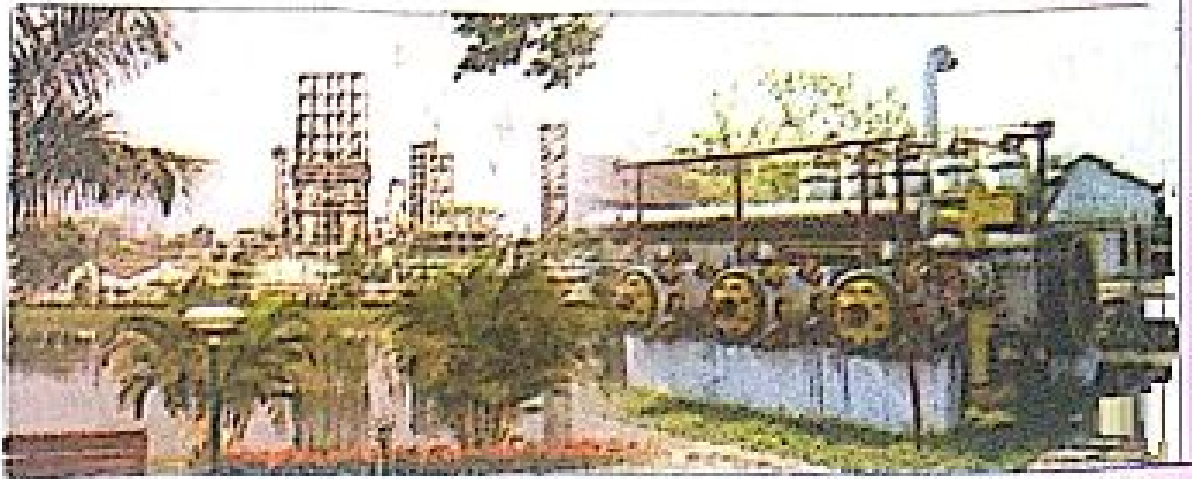


Fig. 4.7 : A picture of Digboi oil field

the previous year, i.e., 2011-12.

#### **4.4.3. : Problems and Prospects of Economic Development of Assam**

The economy of Assam is mainly dependent on agriculture. Agriculture is the main occupation of about 75 per cent people of the state. But, it is important to note that its agricultural sector is not so developed till now. The reason is that there are some problems of agriculture of the state. The major problems are –

- (a) Traditional agriculture in the plains and jhum cultivation in the hills are still practised through the age-old methods.
- (b) The agricultural lands of the farmers are fragmented into small plots, where it is difficult to use the modern agricultural implements and techniques.
- (c) Method of irrigation is not developed and irrigation facilities are not adequate.
- (d) Rice is extensively cultivated in the state and it has its significant impact on agro-economy. But, no due importance is given on application of modern agricultural methods for development of rice cultivation.
- (e) Agriculture of the state is badly affected by flood and bank erosion. Annually crops of more than 25 per cent croplands of the state are damaged by flood and large areas of fertile alluvial lands are also lost annually due to river bank erosion.
- (f) In order to protect the agricultural activities as well as the farmers from severe drought, there is no proper agricultural planning.
- (g) Crop protection and crop harvesting methods are not developed.
- (h) Facilities for crop preservation, especially for the food crops are very limited.

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- (i) Farmers have become poor, because there is no provision that the farmers can directly get the reasonable price for the crops they produce.
- (j) Farmers are in want of facilities for easily obtaining high quality seeds, necessary fertilizers, agricultural implements and loans at subsidised rates.
- (k) There is lack of developed communication and transport system linking the interior agricultural regions with the markets of towns and cities.
- (l) The agricultural sector and the agro-based industrial sectors are not progressing parallelly.
- (m) There is limited use of comparatively low cost electricity in mechanization of agriculture and
- (n) The overall infrastructure actually lacks in the state for agricultural development of the state.

However, some modern agricultural methods are being slowly applied recently in the agricultural sector to a limited extent. As a result, agricultural production has increased by some amount. Fooderops are grown in about three-fourth of the total croplands of the state. Among these rice is extensively cultivated. So, the agro-economic development of the state mostly depends on development of rice cultivation. Recently, the cultivation of fruits and vegetables has expanded. The major cash crops produced in the state include tea, jute, sugarcane and tobacco. Tea has made substantial contribution to the state economy. In this regard, the role of the small scale tea cultivation is also noticeable.

Like the agricultural sector, the industrial sector has also important role in economy. But, the ongoing industrialization process in the state is slow in spite of having more prospects. The main reasons for this are-

- (a) There is lack of integrated planning for industrial development through proper utilisation of the natural resources of the state.
- (b) Progress of development of agro-based industries is limited and slow in spite of more prospects.
- (c) Underdeveloped transport and communication system.
- (d) Insufficient capital.
- (e) In proportion to demand and requirement, supply and distribution of energy is not adequate.
- (f) No proper planning to generate enterprising zeal among the local people.
- (g) There is lack of a simple and flexible industrial policy in the state.
- (h) Investment in industrial sector is not satisfactory, because the investors from outside are not so interested to invest, especially due to insurgency problem arising in the state.
- (i) In spite of plenty of prospects, the tourism industry of the state is not so developed due to problems like inadequate capital investment, underdeveloped transport system, lack of environment

*Geography*

to attract foreign tourists, poor infrastructure of the tourist spots etc.

- (j) Due to lack of proper storage for preservation of perishable agro-products, the food processing industry has not developed much.
- (k) Above all, there is lack of necessary infrastructure for industrial development in the state.

There were no such important industries in the state except the tea industry and Digboi Refinery before Independence. But during the last two-three decades efforts are made to promote necessary infrastructure for industrialisation. As a result, some industries have come up. Among these the major industries include oil refineries, petro-chemical industries, fertilizer industry, paper mill, cement industries, sugar mill, cotton and jute industries. Presently, there are more than 100 medium scale industries and about 17,500 small scale industries in the state. On the other hand, the handloom and handicraft industries like Eri, Muga and Pat textiles, bamboo-cane industries, brass and bell metal industries are developed in the state. Muga yarn (Golden silk) production is the monopoly industry of Assam. But it is important to note that these local industries have been facing competition from the modern industrial products imported from outside due to lack of proper markets, adequate capital investment, infrastructure and modern technology.

Assam is rich in mineral resources. Coal, oil, natural gas and limestones are the major mineral resources of Assam. A good amount of royalty is obtained from these resources. Similarly, substantial amounts of revenue are collected from the forest products, such as wood, bamboo, cane, firewood, thatch etc. fish resources of the wetlands and sand-gravels of the river beds. Some revenues are also obtained from the tourism sector. However, there is more prospect for tourism development in the state. Assam is also rich in land and water resources. But, no suitable land use planning is taken up on the basis of soil properties of the state. It is a fact that proper use of land resources may accelerate the economic development of the state. On the other hand, the water resources of the Brahmaputra and Barak and their innumerable tributaries are not utilized properly. If the water resources are used in the agricultural, industrial, energy and transport sectors with suitable planning, only then the state economy will flourish.

Like in the other states of India, Assam also has plenty of prospects for human resource development. But, in view of occupational characteristics of its population, the state has not been able to achieve development in the secondary and tertiary sectors except in the primary occupation sector. Human development is possible only when the people can be employed in all the economic sectors by creating working skill of the large population of the state. Moreover, the people of the weaker section, especially the poor and the woman should be properly empowered. The natural resources (land, forest, water etc.) should not be unwisely utilized only in the name of economic development. Emphasis should be given on the uses of the natural resources with proper planning from sustainable development perspective. Above all, there should be good co-ordination among the economic sectors like agriculture, industry, power, transport, service sectors etc. for overall development of the state.

#### *Environment and Environmental Problems*

## SUMMARY

- ☛ Assam covers 2.4 per cent area of India and has 2.6 per cent population of the country (As per 2011 census).
- ☛ Literacy rate and sex ratio have increased in Assam during 2001-11. Again the percentage of rural population has decreased while percentage of urban population has increased.
- ☛ There are 7 Class-I towns and 6 Class-II towns in Assam as per 2011 census data.
- ☛ Although the population growth in Assam depends on birth rate, death rate and migration, the impact of migration is very significant.
- ☛ Assam's population increased by more than two times during the four decades from 1901 to 1941. But, it had increased rapidly during the post Independence period from 1951 to 1971. However, population decreased slowly during 1981-2011.
- ☛ Due to uneven distribution of population in the state, population density also varies from region to region. In the Brahmaputra Valley population density is found to increase from its upper part to middle part and then from middle part to lower part. Similarly, the Barak Valley has high population density and the hill zone covering Karbi Anglong and Dima Hasao district has low density of population.
- ☛ According to data of 2011 census, Kamrup (Metro) is the most densely populated district, while Dima Hasao district is the most sparsely populated district of the state.
- ☛ Different ethnic groups of people have been migrating to Assam since the past and as a result assemblage of various groups of people with their diversified languages, religions and cultures took place. Such variations and diversities are the special characteristics of Assam and these have been immensely enriching the Assamese society and culture.
- ☛ As because Assam is the gateway of North-East India, the development of the transport system of Assam is directly helpful for the economic development of the North-East.
- ☛ The transport systems of Assam include the road, rail, water and air transport. All these transport systems suffer from a number of problems. The transport sector of Assam is not developed up to the mark.
- ☛ In the case of economic development of Assam both the resources— natural and human are important and Assam is rich in these two types of resources.
- ☛ The major natural resources of Assam are the land, forest, mineral and water resources.
- ☛ Although Assam is rich in natural resources, these are not utilized properly so far. Presently there arises crisis of natural resources due to improper use and haphazard exploitation of these. In this regard, the misuse of natural and human resources should be checked by properly using and conserving these through suitable resource planning, so as to achieve overall development of the state.
- ☛ Assam's economy is basically dependent on agriculture. About 75% of the people

of the state are engaged in agriculture. Moreover, about 53% or more of the total working population are directly or indirectly engaged in agriculture.

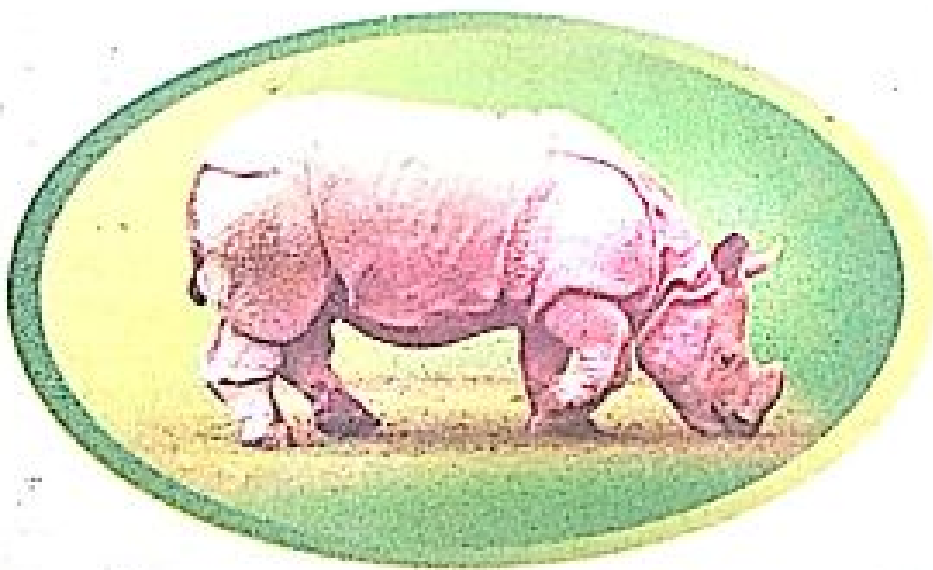
- ☞ Based on the soil types and properties, topographic characteristics, variation in the distribution of temperature and rainfall, Assam has been divided into six agro-climatic zones, such as (1) Lower Brahmaputra Valley Zone, (2) North Bank Plain Zone, (3) Middle Brahmaputra Valley Zone, (4) Upper Brahmaputra Valley Zone, (5) Barak Valley Zone and (6) Hill Zone.
- ☞ Rice is the major crop of Assam. Three types of rice are cultivated, such as Autumn rice, Winter rice and Bodo rice.
- ☞ Jhum cultivation (shifting cultivation) is widely practised in the two hill districts—Karbi Anglong and Dima Hasao.
- ☞ Assam is still backward in the industrial sector in spite of plenty of natural resources including valuable minerals.
- ☞ The industries of Assam can be classified into five types, e.g., (1) Mining industries, (2) Handicraft industries, (3) Agro-based industries, (4) Power industries and (5) Service sector industries.
- ☞ There are ample prospects for development of agro-based industries in Assam. Tea industry is the biggest agro-based industry of the state and it has a good name not in India but also in the world.
- ☞ Till today slow growth has been observed in the agricultural and industrial sector and necessary measures are to be taken to remove the problems of these two major sectors of state economy.
- ☞ There are a number of problems and plenty of prospects for economic development of Assam. The problems should be removed and due emphasis should be given on the prospects.
- ☞ For overall development of the state, the economic sectors like agricultural, industrial, energy, transport, service sectors etc. should be brought ahead by maintaining co-ordination among them.

## EXERCISE

1. Write briefly about Assam's land area, population and population density with necessary data.
2. Briefly mention how the literacy rate of Assam is increasing.
3. How many first class and second class towns are there in Assam as per 2011 census data?
4. Describe the trend of population growth in Assam during 1901-2011.
5. Analyse the geographical region-wise distribution of population in Assam.
6. Briefly discuss the causes responsible for variation in the distribution of Assam's population with suitable examples.



## AHIMSA PARAMA DHARMA



**THE ONE HORNED RHINOCEROS IS AN ASSET OF THE STATE OF ASSAM  
THE KILLER OF THIS RHINO IS AN ENEMY OF THE STATE.**

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