Selected Districts of Assam: A Geographical Background

The selected districts of Assam, the areas under study, lie in subtropical areas between the latitudes 24.3°N and 28°N and eastern longitudes in between 89°E and 96.1°E. Assam is surrounded on three sides by hills and mountains. The river Brahmaputra and Barak, in the north and south respectively, curve out deep valleys that represent the major part of the state. Between the two valleys there lies a strip of highland made up by hills and plateaus. The two plains form the eastern most parts of the north Indian plain, which are apparently shut to the South-East Asia by the Patkai Range and its southward extension. In the north, the Brahmaputra plain rises to the Himalayas, while to the east, the parallel hills of ranges of Arunachal, Nagaland and Manipur-Arakan Yoma hills. Although the hills and mountain mentioned above appear to provide physical blocked, they are not inaccessible. Situated at such, it is a transitional territory between south Asia and South-East Asia.

The study area covers an area of 13,408 km² representing 17.0 percent of Assam landmass and a population of 6,037,038 (2001) accounting for 22.64 percent of the total population of Assam. Among the selected districts, Dhubri is situated in the westernmost part of the Brahmaputra valley, bounded by Kokrajhar district on the north, Bongaigaon and Goalpara districts on the east, Meghalaya on the south and Bangladesh and a portion of west Bengal on the
The district has an area of 2798 km² representing 3.6 percent of the Assam's total area and a population 1,637,344 (2001) accounting for 6.1 percent of the total population of Assam. Nagaon district is bounded on the north by the Brahmaputra River, on the east and south by Karbi Anglong district and on the west by Morigaon district. The district has an area of 3831 km² representing 4.9 percent of the total area of Assam and a population 2,314,629 (2001) accounting for 8.7 percent of the total population of Assam. Lakhimpur district is bounded by Arunachal Pradesh on the north, Dhemaji and parts of Dibrugarh districts on the east, Jorhat district on the south and Sonitpur district on the west. The district has an area of 2277km² representing 2.9 percent of the total area of Assam and a population of 889,010 (2001) accounting for 3.3 percent of total population of the state. North Cachar Hills district is bounded by Karbi Anglong and Nagaon district on the north, Nagaland and Manipur on the east, Cachar district on the south and Meghalaya on the west. The district has an area of 2693 km² representing 3.4 percent of total area of Assam and population of 188,079 (2001) accounting for 0.71 percent of the total population of Assam. Karimganj district is bounded by Bangladesh and a part of Cachar district on the north, Hailakandi district on the east, parts of Mizoram and Tripura on the south and Tripura and Bangladesh on the west. The district has an area of 1809 km² representing 2.3 percent of total area of Assam and a population of 1,007,976 (2001) accounting for 3.8 percent of the total population of Assam.
According to 2001 census Assam has 23 administrative districts. Out of these, the above mention five districts has been taken for study. Among the five districts Dhubri lies in the western Brahmaputra valley, Nagaon in the Central Brahmaputra valley, Lakhimpur in the eastern Brahmaputra valley, North Cachar hills in the eastern hills zone and Karimganj lies in the Barak plain.

2.1 Physical Background

2.1.1 Geology

The state of Assam which include selected five districts, occupies a unique position amid complex geologic and physiographic make up of northeastern region of India. It is bordered on the north by the Arunachal Himalayas, on the south by Meghalaya plate an and the hills of Manipur, Mizoram and Tripura, on the east by the Arunachal Himalayas and Naga-Patkai hills ranges and the west by the plains of Bangladesh and west Bengal. The state is bounded by highlands of hills and plateau on the three sides except the western one, where the Brahmaputra valley merges with the gangetic plain. The geological formation of Assam reveals that the rocks formation belongs to the Archean, Pre-cambrian, Tertiary and Quaternary periods. As revealed by its geologic history, the formation of the study area may be broadly classified into five. These include (i) the Archaean group of rocks (ii) the pre-cambrian rocks (iii) the lower tertiary sediments (iv) the upper tertiary sediments and (v) Quaternary sediments.

The Archaean rocks comprise of metamorphic rock types of gneisses and schists which are intruded by younger acidic and basic intrusives. The rocks are
found to occur Assam Meghalaya border. The isolated monad nocks like remains consisting of guesses and granites scattered in Nagaon district. The pre-cambrian rocks consisting of quartzites and phyllites are confined to small areas over the western flank of the Karbi plateau and the northern part of the North Cachar hills. The upper tertiary sediments of sandstone, sandy shales and silts deposited during the Oligocene-Miocene-Pliocene period are confined to the North Cachar hills. The lower Tertiary sediments known as the Jaintia group composed mainly of sandstone and limestone got deposited during the Eocene period and are found occur in the Kopili Valley of Nagoan and some parts of the North Cachar hills and narrow belt of the Himalayan foothills of Lakhimpur district. The Quaternary sediments of older and newer alluviums, on the other hand, comprise the recent alluvial deposits of the Brahmaputra and the Barak valleys, the red river-bank soils and high level of terrace deposits.

2.1.2 Physiography:

The present physiographic configuration of Assam has taken its shape only during the geologically recent times. The geology and tectonic base of the state has given rise to a variety of landforms under varying climatic conditions and geomorphic processes.

The low hill ranges with hot and humid climate and heavy rainfall concentrated to a few months of the year, experience solifluction sheet erosion and landslides. The incidence of landslides is high in the Himalayan foot hills where heavy rainfall, high seismicity and toe-cutting of hills slopes by the streams are most frequent. Heavy rainfall often loosen soils and soft Tertiary
rocks of the Himalayan foothills as rain water percolates through joints, fractures, foliations and pores of rocks and soils. This eventually leads to heavy landslides. Fluvial processes on the other hand, are significantly dominant on the valley bottoms and plains where alluvial deposition takes place due to erosion of the higher surface by rivers and flooding in the valleys. This erosional activities and frequent seismic movements play dominant role in shaping various physiographic units of the state. However, the study area of the state physiographically may be described in terms of the physiographic elements like plains, foothills, flood plains, hills and river valleys, thus, the broad physiographic divisions of the study areas can be delineated as (a) the Brahmaputra valley (b) the Barak valley (c) the Barail and southern hills. (Fig. 2.1)

Fig: 2.1
The Brahmaputra valley is the major Physiographic unit of Assam. It is a narrow valley with an approximate east-west extension of about 720 km and average width of 80 km. The valley is girdled by the Eastern Himalaya on the north east and the Naga Hills, Karbi and Meghalaya Plateaus on the south. It is open the west merging with the plains of west Bengal and Bangladesh. The valley as a whole gently slopes from north-east to south-west.

The Brahmaputra valley in its east-west direction has four distinct physiographic units, viz. the northern foothills, the north and south bank plains and Charlands, and the southern foothills. The Northern foothills comprise the sub-Himalaya ranges mainly compose of Tertiary sandstones. The narrow zone with elevation ranging between 150-600 m is relating wider in the western part and taper eastward in Lakhimpur district. The highlands are characterized by southerly dipping piedmont plains formed as a result of coalescence of alluvial comes. It is a zone of unassorted detritus, where a major portion of stream water percolates down and reappears a few kilometers downstream. The southern part of this zone, a plain of tall grasses and damp soil which provides ideal sites for reserved forests and wildlife sanctuaries.

The build-up zone of the valley lying between the northern and southern foothills and active flood plain is made up of the recent alluvial sediments carried by the Brahmaputra and its tributaries from the surrounding highlands. This zone consisting of the north-bank and south bank plains is a region of immense human significance with high population density, rich agricultural fields and a good network of roads and railways. The north bank plain in
Dhubri district is relatively wider, being about 30 km on an average while it narrow down to an average of about 10 km in Lakhimpur district. The south bank plain, an the other hand, is narrow on the average of about 5 km in Dhubri district due to jutting out of the Meghalaya plateau towards the south bank of the Brahmaputra. The plain then starts widening to the east of Guwahati and merges with the Kopili plain. Thereafter, the plain again gets reduced to narrow strip in Nagaon due to northward extension of Karbi Plateau. Like the north bank built-up plain, the south bank built-up plain also supports high population concentration, fertile agricultural field and the network of roads and railways. Health service centres, hospitals etc. are more in this part of the state. Therefore, majority of people live in this part aware of the health care practices.

The flood plain of the Brahmaputra including the charlands inside the river lies between the north and south bank plains. The flood plain is irregular in its transverse extension due to occurrence of occasional hillocks and incipient levees on both the bank, of the Brahmaputra, on the north bank; the flood plain contains swamps and ‘beels’ in Dhubri and Lakhimpur. The floodplain is some what extensive in Nagaon district. The flood plain zone of the Brahmaputra valley provides Ahu and Bao rice fields the islands inside the rivers support favourable sites for rabi crops and cottle grazing. The continuity of floodplain is broken by some isolated hillocks of Archaean origin do the along both the banks of the Brahmaputra. Starting from the eastern most Sirang Pahar (189 m) in Nagaon district, the other important south bank hillocks towards west include the Kukrakata Pahar (270m) and Kamakhya Hill (239m) of Nagaon.
district on the north bank of Dhubri district the chandardinga (245m), the Dudhnath (210m) and the Tokrabandha (258m) hillocks are found. All these Archaean hillocks are the remnants of the northern outcrops of the Karbi and Meghalaya plateaus. In active flood plain gone majority of Muslim population are not aware of the health care practices.

The foothills bordering the southern fringe of the Brahmaputra valley comprise the foothills of the patkai-Naga ranges, northern foothills of Meghalaya and Karbi Plateau and the Barail range. The foothills of Karbi plateau which belong to Archaean formations, extend along the its northern, eastern and western margins with an average elevation of 500m. The rivers like Dhansiri, Kalong and Kapili with their numerous tripularies extend fingerlike plain embayments into the plateau along the foothills. These plains, in their turn, descend to the Brahmaputra plain through terraces. Such terraces filled with older alluvium and residual soils support rich tea gardens in Nagaon district. The foothill lying along the Assam-Meghalaya border form the parts of Garo hills. These hills after losing their heights merge with the Brahmaputra plain through gentle gradients punctuated occasionally by isolated hillocks and Hills in Dhubri district. The rivers flow northward down the plateau and create small embayment valleys by dissecting and denuding the foothills. In general, the southern foothill belt of Nagaon and Dhubri districts is characterized by erosional platforms born out of age-old erosion by the streams alternated with a series of beels and swamps. The north-western part of the tertiary Baroil range also form a section of the southern foothill zone of the Brahmaputra valley. The
foothills on the north western face of the Barail range with elevation between
600m and 1400m cover the northern part of North Cachar Hills district and
comprise the catchment weal of the rivers like Dhansiri and Kopili. These two
river system, through their headward erosion, have dissected and devuded the
north facing hills of the Barail range to the foothills of lower elevations and
gentle slopes.

The Barak valley, like the Brahmaputra valley also forms one of the
important physiographic units of Assam. The valley comprising the Barak plain
and northern and southern foothills is product of the fluvio-geomorphic
processes of the Ociver Barak and its tributaries. The Barak River, while
moving westward through Cachar district along the northern border of
Hailakandi and Karimganj districts, builts up its alluvial plain. The Barak plain
slops down gently to west and the river Barak flows sluggishly in meandering
course through its leaving a series of ox-bow lakes and swamps. The
immediate neighbourhood of the river represents an active flood plain
characterized by extensive marshy tracts and annual inundation. Occurrence of
isolated low hillocks in the plain ‘indicates the erosional activities of the Barak
and its tributaries. The western and the Central parts of the plain are built up of
the alluvial deposit. Thus the plain is created by both the aggradational and
degradational activities of the Barak river system. The district Karimganj falls
is the western part of the Barak valley. The southern part of the district is the
foothills of Mizo hills. River sonai and Langai from Mizo hills flow through
the district and join the Barak adding considerable volume of water and load of
sediments. This plain also gradually rises to the north and south and merges with the foothills. The terraces and isolated hillocks on the interfluves, linked often to the foothills, provide ideal site for tea gardens.

The Barail hills of Assam covering N.C. Hills district are the westward continuation of Barail range stretching from Tuensang across Nagaland. The Barail range is a Tertiary mountain range topographically bridging the Archaean Meghalaya plateau with Tertiary Naga hills which is the south-western projection of the Himalaya. The Barail range divides the N.C. Hills into two parts—the northern part falling under the Brahmaputra basin and the southern part falling under the Barak basin. The range rising from 300 m in the southern part of Karbi Plateau attains a maximum height of 1866 m in Thepibug peak of N.C. Hills district. The other notable peaks of Barail range in the district are the Hemeolowa (1679 m), the Mahadeo (1739 m), the Kaukaha (1739 m), and the Tukbai (965 m) peaks. The southern ranges of the Barail range are steeper than the northern face due to faulting. The north flowing rivers like Kopili and Dhansiri and their headstreams have dissected the ranges by their headward erosion and thus have subdued the northern face to lower elevations with gentle slopes.

In the hilly areas hospital facilities though available in the central areas with good transport network people of the remote areas have been suffering without having any medical support.
2.1.3 Soils:

The soils of selected districts of Assam may be divided into four groups, viz. alluvial soil, piedmont soil, hill soil and lateritic soil. (Fig. 2.2)

The alluvial soils are extensively distributed over the Brahmaputra and the Barak plains. Because of alluvium left by the rivers after leaving the hills and flowing through the plains these soils receive high fertility. There are two types of alluvial soils – the younger alluvial and the old alluvial. The younger alluvial soil occurs in an extensive belt of the north bank and south bank plains including the active floodplains of the Brahmaputra and the Barak rivers. The soil characterized by recent alluvium deposits is moderately deep to very deep and gray to molted gray. It is mostly composed of sandy to silty loams and
slightly acidic in reaction. On the river banks it is less acidic, sometimes neutral or slightly alkaline. This soil lacks in profile development and is deficient in phosphoric acid, nitrogen and humus. The old alluvial soil accures in Lakhimpur district between the northern piedmont soil belt and the southern new alluvial soils. In the Kopili plain covering Nagaon district the old alluvium finds wider extension. The Barak plain, on the other hand, has some elongated patches of old alluvium confined between the new alluvial soils of the active flood plain and the hills soil bordering Mizohills. Generally the old alluvium soil is very deep, brownish to yellowish brown with texture of five loans to coarse loans and slightly to moderately acidic.

The piedmont soils are confined to the northern narrow zone along the piedmont zone of the Himalayan foothills. This soil comprises the Bhabar soil and Tarai soil covering respectively the Bhabar and Tarai belt of the Brahmaputra valley. The Bhabar soil occurs in the narrow Bhabar zone along the Assam Arunachal border extending east up to the river subansiri in Lakhimpur district. This zone consisting of fairly high ground as a result of the coalescence of alluvial coves is characterise by unassorted detrits of boulders, pebbles, cobbles, sands and silts. As developed from the upper Tertiary sediments, this soil is deep to very deep and fine to coarse loamy texture. The Tarai soil of the Tarai region occurring just south of the Bhabar soils in some discontinuous narrow patches. This soil varies from sandy to silty loams that remain saturated and support tall grasses in a series of swamps.
The hilly soils generally found in the southern hilly terrain of the state. The fertility of these soils differ greatly in different regions. These soils are rich in nitrogen and organic matters on the basis of the physical texture and chemical composition, the hill soils may be divided into red sandy soils and red loamy soils. The red sandy soils are distributed covering a narrow belt along the Assam-Meghalaya boarder and southern parts of Barail ranges of N.C. Hills district. These soils mostly derived from the parent material of Archaean origin are very deep, well drained and brownish to yellowish red in colour. These are strongly to moderately acidic with high organic content. The red loamy soils, on the other hand, occur in the narrow southern foothill belt running along the Assam’s boarder with Arunachal and Barail hills of N.C.Hills district. A few patches of these soils trending north south are also found along the Assam-Mizoram boarder. These soils are deep, dark greenish brown to to yellowish red and fine to coarse loamy. Red loamy soils are lightly to moderately acidic and these lack of nitrogen, phosphoric acid, humus and lime.

The lateritic soil extensively occur almost entirely over the N.C. Hills district covering some parts of southern Karbi Plateau and the northern part of Barak plain along with foothills of the Barail range. These soils are dark and finely textured with heavy loams and deficient in nitrogen, potash, phosphoric acid and lime.

In general, the soils of Assam are rich in contents of nitrogen and organic matter. The alluvial soils of the Brahmaputra and the Barak valley are
highly fertile and suitable for raising cereals, oilseeds, pulses and plantation crops. These soils are very responsive to manuring and irrigation new alluvial soil occurring the charlands of the Brahmaputra are most suitable for growing oilseeds, pulses and rabi crops. The alluviums of inter-hills plains offer excellent opportunity for cultivating rice and vegetables. Serils occurring in the upper reaches of the hill slope are favourable for horticultural and plantation crops while the soil of the lower reaches and narrow valley may be well utilized for paddy and vegetables. Acidic alluvial soils of the upper Brahmaputra valley with a good proportion of phosphoric content are mostly suitable for tea plantation.

As in the other part of India the soils of Assam also suffer from a number of soil degradation problems like heavy erosion in the hill slopes, flooding and water logging in the low lying areas and high acidic nature of the soils, under heavy precipitation and humid climate loss of top soil through surface renoff is the most common type of soil degradation in the entire state.

2.1.4 Climate:

The selected districts of Assam lie in the regime of monsoon climate of the sub-tropical belt. It enjoys heavy summer rainfall, winter drought, high humidity and relatively low temperature during the year. The selected districts of Assam show marked spatial variation in the climatic pattern primarily because of its location and physiography the seasonal change in the pressure condition over the Bay of Bengal and the north-western Indian landmass, the
tropical oceanic air masses of the south-west monsoon, flow of local mountain and valley winds and presence of water bodies and rivers.

The Himalayan ranges standing an the north and the east of the Brahmaputra valley protect the area from chilly cold winds of the Tibetan region in winter and obstruct the worm moist winds blowing from the south-west in summer. The cloud brought by the south-west monsoon that passes over the southern hills including Meghalaya Plateau precipitates in the Brahmaputra valley. The precipitation decreases on the lee-ward side of the hills, especially the eastern portions of the hilly areas of Karbi Anglong and North Cachar and increases towards the foothills of the Himalayas. The depression at the eastern and of the Himalayas permits the north-east monsoon during the post winter months and has an influence on the precipitation of the valley. The Barak valley, on the other hand, permits the south-west monsoon to penetrate east ward up to Manipur hills and receives heavy rainfall. The valley being converging and bounded by highlands on the north, the east and the south is open on the west to orographic and other cyclonic disturbances of the south west monsoon. The following table 2.1 shows the variation in rainfall in the selected district of Assam. The table indicates that Karimganj receive the highest rainfall of 456 cm on the average annual basis and N.C. Hills records the lowest amount of average annual rainfall of 114cm.
Table 2.1: Average annual rainfall in the selected districts of Assam.

<table>
<thead>
<tr>
<th>District</th>
<th>Rainfall (cm) (2004-05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dhubri</td>
<td>323</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>154</td>
</tr>
<tr>
<td>3. Nagaon</td>
<td>154</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>114</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>456</td>
</tr>
<tr>
<td>Assam</td>
<td>226</td>
</tr>
</tbody>
</table>

Source: Statistical Hand Book, Assam, 2006

So far the spatial distribution of rainfall is concerned there is a marked variation within the districts of Assam (fig. 2.3) The unique physiographic features of the state and its surrounding mountain and hill ranges affect the aerial distribution of rainfall. In general, the hill and foothill receive more rainfall, Karimganj and Dhubri districts enjoy annual rainfall more than 300 cm on average. On the other hand Nagaon and N.C. Hills receive relatively low rainfall due to its location on the leeward side of Meghalaya plateau and Karbi hills.
Under varying intensities of the weather elements and resultant weather condition the selected districts of Assam normally experiences four climatic seasons, viz. (i) Pre-Monsoon (ii) Monsoon (iii) Retreating Monsoon and (iv) Dry winter.

(i) **Pre Monsoon:** The Pre Monsoon begins in the early parts of March and continues up to the end of May. Temperature started rising gradually from the beginning of the season onward. Pleasant morning, hot and drying after noon and occasional thundershowers are some of the important characteristics of the season. In this season marked atmospheric instability develops and severe thunderstorms occur, sometimes preceded by dust raising squalls. Rainfall increases both in amount and frequency as the season advances which greatly favour the cultivation of tea, jute and ahu rice.

(ii) **Monsoon:** The monsoon sets in by the last week of May or in early June and lasts up to September or the first week of October. It is the rainy seasons when the state receives spells of continuous and moderate to heavy rains. June, July and August are the rainiest months when more than 70 percent of the total rainfall occurs. This is the most important season during which Sali rice, the principal crop of the state is cultivated on the other hand, the rivers of the Brahmaputra and the Barak valley started rising causing extensive floods.

(iii) **Retreating Monsoon:** The south-west monsoon withdraws sometimes in between in the last part of September and first part of October.
Consequently, the intensity of rainfall and number of rainy days go on decreasing. This season continues up to the middle of November, when fogs commonly occur.

(iv) **Dry winter:** The winter season begins in the middle of November and continues up to the end of February. This season is characterized by low temperature, regular morning fogs and very little amount of rainfall. December and January are the driest months and generally, January is the coldest month.

2.1.5 **Natural Vegetation:**

Assam is well known for its rich forest resources. The variations in altitude, climate and soil types have a significant influence on the luxuriant growth of wide variety of trees, herbs and shrubs in the study area along with Assam. The study area under forest covers 14.3 percent of the total forest coverage of the state. In Karimganj district the forest coverage area is the highest (36.2%) Table 2.2. The vegetation of the plains is characterized by dense and mixed semi-evergreen, evergreen and wet deciduous types. The forests types in the hills and mountains of the districts range from tropical evergreen in the foot hills, through temperate evergreen in the middle ranges. The evergreen and semi evergreen forests are found in the districts of Lakhimpur, Nagaon, N.C.Hills and Dhubri on the other hand, deciduous forests are found in the districts of Dhubri and Nagaon. Apart from Dhubri district all the other four districts viz. Nagaon, N.C. Hills, Lakhimpur and Karimganj have degraded scrub. The valuable spices found in the forests of the selected districts
are Sal (Shorea robusta), Teak (Tectona grandis), Titasopa (Michelia champasa), Khair (Aceacia Catechu), gomari (Gmelina arborea), Simul (Bambax malabricum), etc. Apart from these, bamboo, canes and variety of fruit trees found in the study area are of great economic value. This region is rich in orchids; Tall grasses up to height of 4-5 m are found in the foothills of the Arunachal Himalayas and also along the riverine tracts of the Brahmaputra and its major tributaries. Along with Bamboos these can be used for making pulp, paper and paper board (Bhagabati, 1986). The Haphazard deforestation has led not only to increased soil erosion on the hills and sedimentation leading to inundation in the plains, but also to disturb the very ecological balance of the region.

Table 2.2: Distribution of forest area in the selected districts (in hectare), 2005

<table>
<thead>
<tr>
<th>District</th>
<th>Geographical Area</th>
<th>Forest land</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhubri</td>
<td>279800</td>
<td>46503</td>
<td>16.6</td>
</tr>
<tr>
<td>Nagaon</td>
<td>397300</td>
<td>100858</td>
<td>25.4</td>
</tr>
<tr>
<td>Lakhimpur</td>
<td>227700</td>
<td>32226</td>
<td>14.2</td>
</tr>
<tr>
<td>N.C. Hills</td>
<td>488800</td>
<td>63777</td>
<td>13.0</td>
</tr>
<tr>
<td>Karimganj</td>
<td>180900</td>
<td>65529</td>
<td>36.2</td>
</tr>
<tr>
<td>Assam</td>
<td>7843800</td>
<td>2088183</td>
<td>26.6</td>
</tr>
</tbody>
</table>

Source: Calculated on the basis of data from Statistical Hand Book of Assam, 2006

The complex diversities in environmental conditions in respect of physiography, climate, soil and vegetation in the region as revealed in forgoing
discussion would certainly have great impact on the socio-economic life of its people both in positive and negative directions (Fig. 2.4).

Fig. 2.4

2.2 Socio-Economic Background:

The study area is overwhelmingly an agrarian region where 89 percent of the total population of the districts lives in more than 7013 villages (2001). Although the study area is well endowed with an infinite variety of natural resources required for different secondary production, its pace of industrialization and urbanization has together been very slow, what ever industries have come up in recent years are very few in number and generally small in size and concentrated particularly in the plains. Although percentage share of workers in secondary and tertiary sectors is slowly increasing over the years, the primary sector still absorbs more than 81 percent of the total main
worker of the study area (2001). Added to these, in cultural front, the study area is variable cauldron of diverse racial, linguistic and socio-cultural groups coming from different directions since time immemorial. Thus a brief discussion on the study area about population growth and distribution and social composition would certainly help understand the socio-economic characteristics of the population.

2.2.1 Population Growth:

According to 2001 Census, the study areas have a population of 6037038 which constitutes 22.64 percent of the state’s total population. Among the selected districts, Nagaon district alone constitutes 38.3 percent of the total population of the selected districts, followed by Dhubri with 27.0 percent and the rest 34.7 percent in the other three districts (Table 2.3) of the total population, only 11.0 percent live in as many as 27 urban areas.

Table 2.3: Districtwise population distribution in the selected districts, 2001.

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
<th>Percentage share of population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dhubri</td>
<td>1,637,344</td>
<td>27.0</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>2,314,629</td>
<td>38.3</td>
</tr>
<tr>
<td>3. Lakhimpur</td>
<td>889,010</td>
<td>15.0</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>188,079</td>
<td>3.1</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>1,007,976</td>
<td>16.6</td>
</tr>
<tr>
<td>District’s total</td>
<td>6,037,038</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Census of India, 2001*
Assam witnesses an alarming high growth rate of population during the present century. Such an alarmingly high growth rate is cause not only by natural growth, but by huge inflow of migrant from adjacent countries like Bangladesh and Nepal and Other parts of India also.

Within the districts again, the growth rates of population vary significantly. While during 1971-1991, N.C. Hills districts (98.30 percent) and Karimganj (42.08 percent) recorded respectively the highest and lowest percentage growth in the study area. During 1991-2001 also N.C. Hills (24.72 percent) recorded the highest and Karimganj (21.87 percent) recorded lowest growth of population (Table 2.4).


<table>
<thead>
<tr>
<th>District</th>
<th>Population Growth in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dhubri</td>
<td>56.57</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>51.26</td>
</tr>
<tr>
<td>3. Lakhimpur</td>
<td>56.29</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>98.30</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>42.08</td>
</tr>
<tr>
<td>Assam</td>
<td>53.26</td>
</tr>
</tbody>
</table>

Source: Census of India, 2001
2.2.2 Population Distribution and Density:

Spatial distribution and density of population in the selected districts of Assam is very uneven. In fact, the present pattern of distribution and density of population in the region is the direct reflection of its spatially varied environmental conditions.

Population density during 1991 census was above 400 in Dhubri, Nagaon and Karimganj district and found lowest in N.C. Hills (31), during 2001 census was increased above 500 in Dhubri, Nagaon and Karimganj and in N.C. Hill it increased upto 38 where in the state it was 286 during 1991 census and increased up to 340 during 2001 census. The resultant pattern of population reveals that the density is strikingly high in the districts where the impact of migration is notably high and the muslims constitution a significant proportion of total population. (Table 2.5)

Table 2.5: Density of population in the selected districts of Assam in 1991 and 2001.

<table>
<thead>
<tr>
<th>District</th>
<th>Density of population (person/Km$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1991</td>
</tr>
<tr>
<td>1. Dhubri</td>
<td>471</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>494</td>
</tr>
<tr>
<td>3. Lakhimpur</td>
<td>330</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>31</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>457</td>
</tr>
<tr>
<td>Assam</td>
<td>286</td>
</tr>
</tbody>
</table>

Source: Census of India, 1991 and 2001
2.2.3 Ethnic Composition of Population:

Assam has a long history of peopling. It has witnessed several waves and streams of migration of people belonging to various racial and ethnolinguistic group from different directions since prehistoric time. But very little can be deciphered to trace the succession of peopling process in the state. Again, process of intermingling of different racial and cultural elements over time has made their identify further complicated.

Broadly speaking, Assam has population of four racial traits (1) Proto-Anstroloid, (2) Mongoloid (3) Aryo- Mongoloid and (4) Aryo-Mongolo-Dravidian. But entholongustically broadly three major groups have been identified in Assam – (1) Austro-Asiatic (2) Tibeto-chinese and Indo-European (Taher, 1993). These groups of people had settled in certain parts of the state in segments in different points of time.

Austro-Asiatic – The peopling process in the state is said to have started with the immingnation of the Australoids of Austro-Asiatic speaking people from South-East Asia quite a few millennium before Christ. Although most of them hope settled in Khasi and Jayantia Hill districts of Meghalaya, a small portion is also found to live in some parts of N.C. Hills and karbi Anglong districts of Assam. After a long gap, another wave of migration of this austoro-Asiatic stock took place into the sate immediately after the British Annexation in 1826. Racially, the Anstorloids are tribal people speaking Mumbai dialects, a breach of Anstro-Asiatic linguistic family. They were brought to Assam by the
British from Central India to work in the tea plantation as labour. They are known as Munda, Ho, Savara, Oraon, Gond tribe etc.

Tibeto-Chinese – The Tibeto-chinese comprise Tibeto-Burman and Siamese-Chinese groups who entered into Assam at different times beginning from pre-historic period. The Tibeto-Burman people who are racially Mongoloid settled in different parts of the state having migrated from Myanmar, erstwhile Burma. The Mishing of upper Assam and the Bodos of lower Assam from the early settlers of this group. The late settlers (after 1826) of this group of people consisted Kochin and Kuichin of Karbi Anglong and N.C. Hills districts of Assam. On the other hand the Siamese-chinese group of people who came this part of the country from shan state of Myanmar during medieval period, forms a large segment of Tibeto-Chinese group. The Ahoms settled in upper Assam represent this segment of people. Professing Hindu religion they have contributed a lot towards building the present Assamese society and culture.

Indo-European – This is another large group of people consisting of both Hindu and Muslims speaking Indo-European languages. Their migration into this part of the country began as early as first millennium B.C. They were originally from concasoid racial descent, and subsequently mixed with the later migrants of the same stock and other racial stocks. The early settlers of this group are the Hindus who migrated from the northern plain of India and settled in the plains of Assam. The Muslims of the same stock started entering Assam from the early thirteen century. Both these important segments of population
who settled in the plains of Assam speak Assamese and Bengali languages. Further, the British annexation, a large group of trademen, technicians and other professionals came to this part of the country from different states of India. They belong to all the major religious groups of the country. The Nepalis also entered into the state during the same period. The Bengali Muslim peasants inhabiting the plains of Assam represents another important segment of immigrants who come to Assam from east while East Bengal (now Bangladesh) before independence in 1947. Almost during that time a substantially large number of Nepalis entered into Assam. Besides, at the time of India’s partition and after that a large number of Hindu refugees and poverty striken Muslim present infiltrated into the state from the erstwhile East Pakistan. Unfortunately, this migration trend has not yet been completely stopped.

2.2.4 Social Composition of Population:

The social composition of Assam as well as the study district may be broadly divided into three social groups – scheduled tribes, scheduled castes and non-scheduled population group. According to 2001 census in Assam scheduled tribe population is 12.41 percent, scheduled caste population is 6.85 percent and non scheduled population is 80.74 percent. Among the selected districts N.C. Hills district has highest scheduled tribe population (68.29%) and lowest in Karimganj district (0.29%) on the other hand schedule caste population is highest in Karimganj district and lowest in N.C. Hill district (Table 2.6).
Table 2.6: Percentage Distribution of scheduled caste and Scheduled Tribe population in the selected districts (2001)

<table>
<thead>
<tr>
<th>District</th>
<th>% of S.T. population to the total population</th>
<th>% of S.C. population to the total population</th>
<th>% of Non-scheduled population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dhubri</td>
<td>1.97</td>
<td>3.86</td>
<td>94.17</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>3.86</td>
<td>9.30</td>
<td>86.84</td>
</tr>
<tr>
<td>3. Lakhimpur</td>
<td>23.49</td>
<td>7.88</td>
<td>68.63</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>68.29</td>
<td>1.79</td>
<td>29.92</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>0.29</td>
<td>12.99</td>
<td>86.72</td>
</tr>
<tr>
<td>Assam</td>
<td>12.41</td>
<td>6.85</td>
<td>80.74</td>
</tr>
</tbody>
</table>

Source: Census of India, 2001

The Dimasa and the Karbi are major hill tribes of N.C. Hills district. The Sonowal-Kachari and Deuri, Bodo, Mishing and Rabha are major plain tribes in the other plain districts. The Muslims and the tribal communities like tea garden labourer and Koch-Rajbonshi are treated under non-scheduled population group in the as well as in the selected districts.

2.2.5 Religious Composition:

Although Hindus predominate the state's population like most parts of the country, the overall pattern of religious composition of the selected districts deviated from the state and national one. Hindus Muslims and Christian are the main religious groups of the state as well the selected districts.
Table 2.7: Percentage Distribution of religious composition in the selected districts (2001)

<table>
<thead>
<tr>
<th>District</th>
<th>Hindu</th>
<th>Muslim</th>
<th>Christian</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dhubri</td>
<td>24.74</td>
<td>74.29</td>
<td>0.76</td>
<td>0.21</td>
</tr>
<tr>
<td>2. Nagaon</td>
<td>47.80</td>
<td>51.00</td>
<td>0.93</td>
<td>0.27</td>
</tr>
<tr>
<td>3. Lakhimpur</td>
<td>79.06</td>
<td>16.14</td>
<td>4.13</td>
<td>0.67</td>
</tr>
<tr>
<td>4. N.C. Hills</td>
<td>69.91</td>
<td>2.48</td>
<td>26.68</td>
<td>0.93</td>
</tr>
<tr>
<td>5. Karimganj</td>
<td>46.70</td>
<td>52.30</td>
<td>0.87</td>
<td>0.13</td>
</tr>
<tr>
<td>Assam</td>
<td>64.89</td>
<td>30.92</td>
<td>3.70</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Source: Census of India, 2001

According to the 2001 census, Hindus, Muslims and Christians is the total population of the state respectively 64.89, 30.92, and 3.70 (the corresponding percent in 1991 census were 67.13, 28.43 and 3.32). Among the selected districts Hindus are highest in Lakhimpur district (79.06 percent) followed by N.C. Hills (69.91 percent). Muslim are seen the highest in Dhubri district (74.29 percent) followed by Karimganj (52.30 percent) and Nagaon (51.00). Christian population has been found the highest in N.C. Hills (26.68 percent). In N.C. Hills district the percentage of Muslim population has been found the lowest (2.48 percent) Table 2.7).

2.2.6 Transportation and Communications:

Although Assam is still much lagging behind in transport and communication compared to other parts of the country, it is now served by all the mother of transportation viz. roads, railways, waterways and airways. They
are contributing, more or less, towards internal growth by consolidating the places located in various corners. They help in bringing villages and towns and the remote and more developed regions closer to one another and enhancing productivity, widening the market and introducing new stimuli to economic activity (Medhi, 1998). Of course, the achievement which can be expected from this sector is yet to reach an optimum level, since Assam is a gateway to the other states of North-Eastern Region, an effective transport system of the state is directly related not only to the development of Assam, but also to the development of the entire region.

Of the four major modes of transport in Assam the internal waterways and airways respectively do not play significant role for the prohibitive cost and non availability of navigable rivers and canals except that of the Brahmaputra River. There are large number of ferryghats on the either banks of the Brahmaputra valley and the Barak and a huge number of cargo and passengers are handled by them. Among the selected districts Dhubri and Lakhimpur have notable ferryghats.

All the selected districts are connected by National and State Highways. Dhubri is connected by 31 No., Nagaon by 37 No., Lakhimpur by 52 No. and Karimganj by 52 No. National High way, N.C. Hills district is connected by state Highways.

Railway network has well connected all the selected district of Assam. The North-Eastern Frontier Railway serving basically the North Eastern states
of India. It is the largest railway system in Asia and fourth largest in the world. (Fig: 2.5)

The Air transport system of the state is yet to reach the expected level. As this system of transport is costly and required constant monitoring, it has covered only a smaller section of the society. Its expansion as well as improvement need due attention.

However, the existing means of transport in the state need better coordination and management in order to optimize the flow of goods and people for integrated growth and development of the state.
2.2.7 Economy:

Agriculture forms the backbone of the economy of Assam. About 52.3 percent of the total workers of the states are engaged in agricultural works. In Lakhimpur district the highest (75%) worker are engaged in agricultural work followed by Dhubri (61%), Nagaon (58.3%) and N.C. Hills (53.8%) an Karimganj district the percentage of agricultural worker are low (40.1%). Foodgrains production and cash crops production in form of plantation agriculture is no less important in the region. Besides the, other plantation crops being grown in the districts (except Dhubri) are coffee and rubber. Assam alone contributes 50 percent of the total tea production in the country. But due to certain ecological and socio-economic features together with lack of modernization in farming practice the agricultural productivity has been for form satisfactory.

In spite of fact that the hilly areas are endowed with huge natural resources, it still remains as one of the industrially less developed region of the country. The industries like agro-based industries, especially tea industry, forest based paper and plywood industries are main industries of the study areas. The study area is also developed in handloom and handicraft cottage industries. Currently, however, effort are being made by the governments for overall economic development of the region as other parts of the country through private sector investments.

The foregoing discussion on socio-economic background of the study area clearly reveals that the socio-economic characteristics in the study area are
significantly different from rest of the country. Primarily based on agriculture and other natural resource based, the study area is economically lagging much behind the advanced states like Maharashtra, Gujrat, Karnataka, Punjab and Haryana. In terms of social and infrastructural development also the picture of the study area is hardly encouraging. The situation is this respect rather has become more serious in recent time in the study area due to high rate of population growth and prevailing insurgency problems.
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