CHAPTER II
GEOGRAPHICAL BACKGROUND OF THE STUDY AREA

2.1 Location:

The Geographical spread of Western Assam extends from 89° 49' 20" E longitude to 91° 48' 16" E longitude and 25° 27' N latitude to 26° 54' N latitude covering lower Brahmaputra valley. Within this area we have six districts. Their respective spread and area are Dhubri 89° 24' 12" E to 90° 30' E longitude 25° 28' N to 26° 25' 30" N latitude with an area of 2838 sq. km. Among all the districts of Western Assam Dhubri district is an exception in that sense it lies in both the south and north bank of the Brahmaputra river. Adjoining to Dhubri district it is Kokrajhar district which lies between 89° 45' 5" E to 90° 58' 20" E longitude and 26° 21' 5" N to 26° 59' E latitude and an area of 3129 sq. km. Bongaigaon is located between 90° 25' 4" E to 90° 52' 10" E longitude and 26° 9' 10" N to 26° 49' 30" N latitude with an area of 2510 sq. km. Goalpara lies is the south bank of the river Brahmaputra covering an area of 1824 sq. km. and extends from 90° 7' E to 91° 5' E longitude and 25° 33' N to 26° 12' N latitude. Barpeta 90° 45' 11" E to 91° 15' 4" E longitude and 26° 25' 5" N to 26° 45' N latitude with an area of 3245 sq. km followed by Nalbari with a longitudinal extension of 91° 15' 8" E to 91° 30' 52" E and latitudinal extention of 26° 12' N to 26° 45' 10" N latitude and an area of 2257 sq. km. (Map 2.1.1)

The total population of Western Assam is 7074218 which is 27 percent of Assam's total population covering an area of 15,619 sq. km, which constitutes about 20 percent of the total area of Assam. It covers six districts - Dhubri, Kokrajhar, Bongaigaon, Goalpara, Barpeta and Nalbari.

2.2 Physiography:

Western Assam is surrounded on the north and south by the hills of the lower Himalayas and the Meghalaya plateau respectively. The most dominating feature in the topography of this region is the course of the river Brahmaputra and its tributaries. Besides alluvial fans are also created by a number of hill streams in the northern part, which come down from the Bhutan Himalayas to the plains of Western Assam. The area is partly erosional
Locational Map of North East India

- INDIA
- WESTERN ASSAM
- BURMA
- WEST BENGAL
- BANGLADESH

Cities:
- KOKRAJHAR
- BONGAIGAON
- BARPETA ROAD
- BARPETA
- NALBARI
- DHUBRI
- GOALPARA

Source: Oxford Atlas
and partly depositional along the foothills while it is depositional in the central part. The hills 
of the north form long ridges and rises to a height of 350 metre above sea level. These are 
generally rocky and covered with shrubs or heavy forest. The hills of the Meghalaya plateau in 
the south are of Archean origin, comprised mostly of granite and granite gneiss, highly 
metamorphosed and crystalline. These hills rise to a height of 240 meter along the foothills of 
Meghalaya plateau. Low ranges of hills are also seen projecting towards the river Brahmaputra, 
which rises up here and there from the flat alluvial plain as isolated hillocks on both the banks. 
Their heights vary from 50 mts. to 89 mts. above mean sea level. Besides this there are 
innumerable river island (locally called charlands) found in the area occupied mostly by 
immigrant Muslims. The Brahmaputra valley is comparatively wider (85 km) in the lower part 
in Western Assam than in its upper reaches (60 km).

The general gradient of the Western Assam valley is from east to west recording 
the height of 47 metre above sea level. But within the valley in the northern bank of the 
Brahmaputra the gradient is from north to south while in the southern bank it is from south to 
north. It is further important to note that the gradient of the middle plain is comparatively less 
than the other parts of Assam facilitating the growth of charlands by deposition of sediments. 
This part of the valley is formed by new alluvium carried by the Brahmaputra and its tributaries 
that come down from the Bhutan Himalaya and Meghalaya plateau. The area below 50 metre, 
hills lie on either bank thus forming the new alluvial zone. From the new alluvial zone upto the 
foot hills in higher bank of the river Brahmaputra there we find another zone of old alluvium 
which is comparatively narrower than the new alluvial zone.

Physiographically the Western Assam has been divided into following (M. Taher 
1986) divisions -

(i) Bhabar zone,

(ii) Tarai zone,

(iii) The central elevated plain and build up zone,

(iv) The Active flood plain and charland zone.
The Bhabar zone is along the foot hills of the northern boundary of the Western Assam having wide variations in water tables formed with boulders, pebbles, gravel etc. It is about 15-18 km in width and about 135 metre to 270 metre above sea level in height. Alluvial fan is common in this part of the Western Assam. Most of the area is forest covered with valuable trees. The southern foothill zone is along the southern boundary of the Goalpara district in the foothill of Meghalaya plateau. The general height of this area is from 55 metre to 289 metre above sea level. It is a narrow area having width ranging from 3 to 5 km. The important hills are the Ajagarh hill (564 m), the Sanpang hill (161 m) and the Dandapal (250 m) etc. But due to the decrease of forest resources and many other reasons people from this region move to the developing towns in search of work or for their livelihood. So these peoples also contribute to the formation of slums directly or indirectly.

The Tarai zone is next to Bhabar zone a damp ground forming a belt where the water permeated in the Bhabar zone and reappears here again. It is about 18 - 20 km in width and general height is 85 metre to 135 metre above sea level. In this zone large numbers of swamps and marshes are found and seasonal streams emerge from them and flow towards south. This area is also covered by dense forest. Peoples from this zone also seen to migrate to the main town areas thus contributing towards the formation of slums.

The central elevated plain and built up zone situated on the south of the Tarai zone. This plain is comparatively elevated than the flood plain in the south. Although dissected by a number of small and big streams the topography of the zone is not so much undulating. Both the depositional and erosional characteristics have been found to be prominent in the area. Due to such characteristics there is depression of soil fertility and decrease of agricultural products day by day. Therefore some people leave these areas and use to settle permanently in many urban regions of Western Assam. The Northern built up area lies parallel to the Bramaputra inbetween the Tarai zone in the north and flood plain in the south. This area is wider in the west than in the east. The width of the zone is ranging from 20 - 25 km. This plain character of the area is again interrupted by the presence of scattered isolated group of hills or hillocks. They are found upto a height of 515 metre above sea level. The important hills of the area are the
Malad hill (233 metre), the Sagkati (300 metre), the Bamuni (95 metre), Luthani (130 metre), Chakrasila (222 metre) the Bhairabkunda (501 metre), the Nakati (515 metre), the Bhumeswar (350 metre) the Bhakuamarichura (455 metre) the Nandagiri (380 metre) and Rajasula hill (325 metre). The general height of this area is 55 metre to 89 metre above sea level. Some other important hills are namely—Baghbor, Satala, Phulara etc. Southern builtup zone is on the southern bank of river Brahmaputra and extends from the active flood plain of the north of the foothills of Meghalaya plateau up to Jaleswar in the district of Goalpara in the east. The width of the area is about 710 km. The general height of the area is approximately 35 metre to 43 metre above sea level. There are numerous isolated hillocks scattered in this part which are interspaced with erosional plain valleys which are suitable for rice cultivation while hilly part is covered with forest having many valuable trees. Among the hills the important ones are the Jukresumi (170 metre) and the Deek (219 metre). Fishing and cultivation of rice are the main occupation of this zone. But due to tremendous increase of population in comparision to production, people from this region migrate to urban parts of Western Assam thus contributing to the formation of slums.

The Brahmaputra flood plain and charland zone is in the middle portion of the Western Assam. This zone mainly south of the high land zone, there lies an active flood plain of the Brahmaputra and its tributaries. The river Brahmaputra has divided this one into two parts. In the north bank this zone extends 10 - 15 km. and in the south bank it extends only 5 - 10 km. Samata, Sarukhetri, Bahari, Mandia, Baguan, Borbhita, Dubapara, Mornoi, Anandanagar, Jogighopa are some of the places of Western Assam which are included in active flood plain zone. This active flood plain part of the Western Assam is mostly covered by marshy land. In the west, east and middle area, flood plain is completely a marshy tract. There are innumerable temporary or permanent charlands or river islands found in the area. All charland are cover from Mukalmuwa char of Nalbari district to Dhubri district char areas and in middle area also found more charland in Goalpara and Barpeta district. Annual flooding of these charlands are common phenomenon causing damage to agricultural fields, houses etc. The flood plain charlands are mainly inhabited by immigrant Muslims, who have been in this part of the state for more than two generations. From these areas people migrate to their nearest urban areas, and are important in terms of
contribution towards formation of slum in the Western Assam towns (Map 2.2.1). In this zone there are some isolated hillocks scattered here and there on both sides of the river Brahmaputra. In the north bank there are viz. the Jogighopa (97 metre) in the extreme eastern side on the bank of river Brahmaputra. The Chandar Digha range (245 metre), the Sonamukhi hill (203 metre), the Tokrabandha hill (274 metre) and the Mahamaya hill in the western part near Bagribari and other important hillocks are Baghbor, Satala, Phulara etc. In the south bank the main hills are the Phopoga (230 metre) the Jojong Khadoran (330 metre), the Srisurjya hill (300 metre) the Rakhasini (177 metre), the Matia (118 metre), the Andhanmua (344 metre), the Pancharatna (208 metre) and the Paglatek hill (218 metre).

2.3 Drainage System:

The Brahmaputra is the main river which flows through the middle and along the boundary for about 270 km. In Western Assam most of the rivers originated from lower Himalaya and Meghalaya plateau respectively and therefore, the rivers that originated in the northern and southern hills ultimately finds their way to the Brahmaputra.

The important north bank tributaries of the Western Assam from east to west are the Puthimari, Buradia, Pagladia, Mara-Pagladia, Tihu, Kaldia, Dekadong, Pahumara, Palla, Chaulkhowa, Beki, Manas, Aai, Champawati, Saralbhanga or Gaurang, Tarang, Hel, Godadhar and the Sonkosh. The Manas is the main tributary of Brahmaputra. The main source of all the tributaries of northern part of Brahmaputra is the Himalaya. These tributaries are more active during summer creating tremendous destruction by flooding and river erosion. Besides the common annual flood, devastating floods are seen to create havoc at an interval of 5 years. Due to these reasons people leave their areas and settle in the nearest towns. This is one of the most important active cause in the dynamics of slum formation.

Among the south bank tributaries of Brahmaputra the important ones are Phulnai, Karnai, Kalpani, Dudhnai and Krishnai, Jinari, Jingiram. The main source of these rivers is the Meghalaya plateau. The southern bank tributaries are also active in summer season and cause flooding and river erosion, which has an effect in the formation of slums.
In the Western Assam the river Brahmaputra has a major role both in positive and negative way. This river causes flooding and river erosion. Some times the erosion is so effective that it destroys some villages in plain regions. From such areas people automatically shift to main urban areas in search of livelihood, compelling them to live in deplorable conditions what sustains them is a ready source of income.

2.4 Climate:

The weather and climate of North Eastern India including Assam is itself a type which is not comparable with any other parts of the Indian subcontinent (Borthakur 1986). The climate of Western Assam broadly falls within humid monsoon type which is characterized by heavy summer rainfall and dry winter. The average annual rainfall in the Western Assam is 2289.5 mm. (2001) and the mean annual temperature is 24.47°C with mean relative humidity of 85 percent.

From end of the month of February temperature begins to rise and mean daily maximum temperature remains inbetween 30°C - 33°C from April to September. October onwards temperature begins to fall and reaches the minimum in the month of January. The annual mean daily maximum temperature of the Western Assam is 31.3°C while the mean daily minimum temperature is 20.3°C.

The monthly average maximum and minimum temperature of Dhubri, Kokrajhar, Bongaigaon, Goalpara, Barpeta Road, Barpeta and Nalbari is presented in Table 2.4.1.

Table 2.4.1 Annual maximum and minimum Temperature in Districts of Western Assam (2001).

<table>
<thead>
<tr>
<th>Name</th>
<th>Maximum Temp°C</th>
<th>Minimum Temp°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhubri</td>
<td>38.30</td>
<td>6.50</td>
</tr>
<tr>
<td>Kokrajhar</td>
<td>38.30</td>
<td>6.50</td>
</tr>
<tr>
<td>Bongaigaon</td>
<td>38.30</td>
<td>6.50</td>
</tr>
<tr>
<td>Goalpara</td>
<td>38.30</td>
<td>6.50</td>
</tr>
<tr>
<td>Barpeta Road</td>
<td>37.50</td>
<td>9.10</td>
</tr>
<tr>
<td>Barpeta</td>
<td>37.50</td>
<td>9.10</td>
</tr>
<tr>
<td>Nalbari</td>
<td>37.50</td>
<td>9.10</td>
</tr>
</tbody>
</table>

Source: Statistical Hand Book of Assam - 2001
The average of these two station i.e. Goalpara and Rupshi may be considered as representative of the whole of Western Assam as there are no other station in the region. Moreover within the Western Assam there is no spatial variation in the temperature distribution.

Rainfall distribution is also not uniform during a year. About 70 percent of total annual rainfall are concentrated in the month of June, July and August which occurs due to south-west monsoon. The rainfall increases from south to north thus recording an average annual rainfall of 2273.4 mm (Map 2.4.1).

Table 2.4.2 Average annual rainfall in Districts of Western Assam.

<table>
<thead>
<tr>
<th>Name</th>
<th>Average Annual Rainfall. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhubri</td>
<td>2127.3</td>
</tr>
<tr>
<td>Kokrajhar</td>
<td>3217.2</td>
</tr>
<tr>
<td>Bongaigaon</td>
<td>2735.9</td>
</tr>
<tr>
<td>Goalpara</td>
<td>1819.3</td>
</tr>
<tr>
<td>Barpeta Road</td>
<td>2177.5</td>
</tr>
<tr>
<td>Barpeta</td>
<td>2177.5</td>
</tr>
<tr>
<td>Nalbari</td>
<td>1659.6</td>
</tr>
</tbody>
</table>

Source: Statistical Hand Book of Assam - 2001

Rainfall also indirectly influence, volume of river water which causes over flow of river banks and inundation of low lying areas, making it difficult for people living in slums and congested areas where drainage is poor.

Like all other parts of Assam the Western Assam is also experiencing four seasons in a year viz. pre-monsoon, monsoon, retreating monsoon and dry winter.

The pre monsoon period starts from early March and continues till early part of June. Temperature begins to rise in these days from March (22.2°C) to June (26.8°C). Thunder storms prevail during this period, because of cyclonic disturbances which is accompanied by afternoon showers.

The monsoon starts in the month of June with the bursting of south west monsoon
and continues up to September. This is a period of high temperature and heavy rainfall. More than 69.44 percent of rainfall occurs during these months. The maximum temperature rises to 35°C. While minimum comes down only to 22°C. Relative humidity is 83 percent during this season.

The retreating monsoon is a short transitional period which begins in the month of October and continues to November. During this period south western monsoon wind is replaced by light unsteady wind which is fed by north easternly wind. Temperature gradually begin to fall but relative humidity remains high (81 percent). Morning fog is a normal feature during this season.

The dry winter starts from December and continues to February, severe cold prevails during this season. Relative humidity tends to be low (February 68 percent). Rainfall is at its lowest during these months.

2.5 Natural vegetation:

The vegetation of Assam region has been studied by a number of workers (Das and Rajkhowa 1968; Rao 1974). Based on these studies the vegetation of Western Assam can primarily be divided into three division viz. Tropical moist and Dry deciduous Forest, Tropical Semi-Evergreen Forest and Grass land (Map 2.5.1).

The major parts of Bhutan foot hills and Meghalaya plateau of the Western Assam is covered by tropical moist dry deciduous type of vegetation. It consists mainly of best quality Sal (Shore robusta) which grows mainly in the western and northern part of Meghalaya plateau. The other valuable trees found in this area are Udal (Sterculia villosa), Sida (Lagerstroemia purvijlora), Azar (Lagerstroemia speciosa), Gomari (Gmelina arborea), Teak (Tectona grandis), Koroi (Albizia procera), Moj (Albizia lucida), Poma (Cedrella toona), Simalu (Bombax ceiba) and some varieties of Bamboo (Bambusa tulda) different species of herbs and creepers are also found in this belt.

Tropical semi-evergreen forest are mainly found in the northern part of the western Assam along the Bhutan border. It is a narrow belt and contains varieties of plant species. The common species are Bonsom (Phoebe goalparensis), Azar (Lagerstroemia speciosa), Bhelu
(Tetrameles nudiflora), Titachopa (Michelia champaka), Hilikha (Terminalia chebula), Outenga (Dillenia indica), Som (Persia bombycina), Gomari (Gmelina arborea), Bhomora (Terminalia bellerica). Besides these, a large number of climbers and lichens, ferns are common in this belt.

The third belt is the grass land found along the bank of the Brahmaputra in the Western Assam locally termed as “Chapori”. The species in the grass lands are – Nal (Phragmites karka), Ekora (Saccharum arundinicum), Khagori (Saccharum spontaneum), etc. Besides these Bamboo (Bambusa tulda) is common in hilly areas as well as in plain areas of the districts. Over and above varieties of medicinal plants are also available.

2.6 Land Use Pattern:

For proper utilization of land resources, a scientific classification of land is essential rather a pre-requisite in any land use planning and development. Unless it is determined as to what is the optimum use of a particular plot of land, what are its problems and their requirement of inputs, no planning can successfully be proposed.

General classification of the land:

Based on data available in statistical hand book, Assam and the data published by Department of Agriculture, Assam the land use pattern in Western Assam may also be classified in the following categories –

(i) Forest,
(ii) Barren and uncultivable land,
(iii) Land put to non-agricultural use,
(iv) Cultivable waste lands,
(v) Permanent pastures and grazing lands,
(vi) Land under miscellaneous tree crops and groves,
(vii) Fallow land,
(viii) Net area sown.
There are 400842 hectares of land under forest which account for 25.36 p.c of the total area of western Assam in 2001. Forest is mainly covered in northern foothill zone and foothill zone of Meghalaya plateau. The lowest percentage (1.11 percent) and highest percentage (10.35 percent) of forest are Barpeta and Bongaigaon in Western Assam respectively. This is due to indiscriminate felling and clearance of forest for cultivation and settlement of the ever increasing population. The only residue of the forest land lies at the foothill zone of Bhutan Himalaya and Meghalaya plateau. Western Assam had a forest cover of 13.12 percent in the year 1994 which came down to 9.73 percent in the year 2001. Thus though it is clear but unfortunate to say that the forest areas as well as forest resources are decreasing gradually. But on the contrary the population is increasing at an alarming rate. The fact is that to meet the demands of this rapidly growing population of western Assam - agricultural lands, settlements are created permanently by cleaning forests.

Barren and uncultivated land covered 7.78 percentage of the total area of Western Assam in 2001. Table 2.6.1 shows that Goalpara district is occupying the highest percentage of barren and uncultivated land (2.18 percent) and lowest is Barpeta district (0.43 percent) under this category. A considerable portion of this district is covered by charlands and wet land of the Brahmaputra flood plain. Some of the char areas remain covered with dry sand and this renders the land barren and uncultivated in the region.

Land put to non-agricultural use is 11.20 percent according to 2001 statistics which includes residential land, roads, railway, embankment etc. Which under no circumstances can be brought under cultivation. This category of land increased by about 2.78 percent during 2001 due to increase of population, development of roads and government offices. The percentage of variation of land under this category varies between 1.07 to 3.54 in Barpeta in Dhubri respectively. Density of population in the Dhubri district is the highest while Barpeta district has the lowest density of population. High density is usually associated with higher percentage of land under settlement, road etc. Land use in towns is mixed with business area, industrial area, public service area, educational area, residencial area, recreational area, administrative area and open area.
### Table 2.6.1 Land use pattern in Western Assam, 2001 (Percent in hectare)

<table>
<thead>
<tr>
<th>SI No.</th>
<th>Name of District in Western Assam</th>
<th>Total area in Hectare</th>
<th>Forest</th>
<th>Percentage</th>
<th>Barren and uncultivable land</th>
<th>Percentage</th>
<th>Land put to non-agricultural uses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dhubri</td>
<td>283800</td>
<td>40540</td>
<td>2.56</td>
<td>14348</td>
<td>0.91</td>
<td>56028</td>
<td>3.54</td>
</tr>
<tr>
<td>2</td>
<td>Kokrajhar</td>
<td>312900</td>
<td>36602</td>
<td>2.31</td>
<td>32819</td>
<td>2.07</td>
<td>22103</td>
<td>1.39</td>
</tr>
<tr>
<td>3</td>
<td>Bongaigaon</td>
<td>251000</td>
<td>163626</td>
<td>10.35</td>
<td>20192</td>
<td>1.27</td>
<td>19405</td>
<td>1.22</td>
</tr>
<tr>
<td>4</td>
<td>Goalpara</td>
<td>182400</td>
<td>55809</td>
<td>3.53</td>
<td>34568</td>
<td>2.18</td>
<td>39366</td>
<td>2.49</td>
</tr>
<tr>
<td>5</td>
<td>Barpeta</td>
<td>324500</td>
<td>17616</td>
<td>1.11</td>
<td>6911</td>
<td>0.43</td>
<td>17066</td>
<td>1.07</td>
</tr>
<tr>
<td>6</td>
<td>Nalbari</td>
<td>225700</td>
<td>86649</td>
<td>5.48</td>
<td>14151</td>
<td>0.89</td>
<td>23080</td>
<td>1.46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cultivable Waste land</th>
<th>Percentage</th>
<th>Permanent pastures and other grazing</th>
<th>Land under Mise, Trees groves not including in net area</th>
<th>Fallow land</th>
<th>Percentage</th>
<th>Net area sown</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3872</td>
<td>0.24</td>
<td>2079</td>
<td>0.13</td>
<td>7156</td>
<td>0.45</td>
<td>11715</td>
</tr>
<tr>
<td>2085</td>
<td>15031</td>
<td>0.95</td>
<td>2516</td>
<td>0.15</td>
<td>2961</td>
<td>0.18</td>
<td>85938</td>
</tr>
<tr>
<td>4573</td>
<td>6528</td>
<td>0.41</td>
<td>25409</td>
<td>1.6</td>
<td>12665</td>
<td>0.8</td>
<td>93203</td>
</tr>
<tr>
<td>675</td>
<td>3576</td>
<td>0.22</td>
<td>3982</td>
<td>0.25</td>
<td>2071</td>
<td>0.13</td>
<td>76269</td>
</tr>
<tr>
<td>1608</td>
<td>11286</td>
<td>0.71</td>
<td>3530</td>
<td>0.22</td>
<td>5934</td>
<td>0.37</td>
<td>146999</td>
</tr>
<tr>
<td>227</td>
<td>12439</td>
<td>0.81</td>
<td>7820</td>
<td>0.49</td>
<td>17340</td>
<td>1.09</td>
<td>170915</td>
</tr>
</tbody>
</table>


Cultivable waste land constitute 1.14 percentage of the total area of the Western Assam in 2001. It is left unfilled on account of physical constraints. This can be brought under cultivation with little efforts by providing certain physical inputs. The highest 0.31 percent and lowest 0.01 percent of cultivable waste lands are found in Goalpara and Nalbari districts respectively. Most of the wet land, river bank area, irrigation dam area of Goalpara is inundated by flood water during monsoon and late monsoon period. The flood water remain stagnant in the absence of effective out lets. For this reason a higher percentage of land remained as waste land in Goalpara district.

Land under permanent pastures and grazing accounted for 3.25 percent of the total area of the Western Assam in 2001. The highest percentage of land (0.95 percent of the total area) under this category is found in Kokrajhar district. This is because the district is situated in the comparatively high and dry middle portion. The highest and lowest rainfall areas are favoured for the growth of grass land and suitable for grazing the domestic animals.
Land under miscellaneous tree crops and groves cover 3.19 percent of the total area of the Western Assam in 2001, which are not included in the net area sown but is put to some agricultural use other than seasonal crops. The district wise variation of land under this category is between 1.60 percent to 0.15 in Bongaigaon and Kokrajhar district respectively. Due to lower density of population in Kokrajhar district, land under this category is higher. The lower density of population facilitates people to raise orchard for individual family. Among the plantation crops, banana, fruit tree, coconuts, arecanuts are predominant. Kokrajhar district has the highest percentage of land under this category.

Fallow land occupied 52686 hectares i.e. 3.33 percent of total area of the Western Assam in 2001. Land remains fallow due to several reasons, viz. poor soil, inadequate water supply and continuous drought or excessive rainfall which causes floods, lack of irrigation facilities and poverty of the peasants. However the farmers occasionally leave the land for recuperance of fertility under natural condition. Fallow land includes mainly current fallow and old fallow. Current fallow occupied 2.22 percent and old fallow occupied 1.10 percent of the total area of the western Assam in 2001. Nalbari district has the highest share of land under this category, (1.09 percent) and Goalpara district has lowest percentage (0.13 percent). The highest percentage of fallow land in Nalbari district is due to lack of irrigation facility and frequent shifting of the course of the river Pagladia. Frequently this area is over flooded during rainy season and the lands by its side is badly silted. This renders it as uncultivable land.

The net sown area of Western Assam is 45.70 percent against the total geographical area of Western Assam in compariison to other land use pattern. It indicates that a higher percentage of land is put to agriculture. The total area under plough fluctuates considerably from year to year depending upon the weather and other factors. The variation of net sown area within the Western Assam is found between 5.01 percent and 10.81 percent. The net sown area is highest in Nalbari district which is 10.81 percent. The land use pattern of Western Assam is shown in table 2.6.3
Table 2.6.3 Agricultural land use of Western Assam 2000 - 01 (Percent in hectare)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Agriculture</th>
<th>Dhubri</th>
<th>Kokrajhar</th>
<th>Bongaigaon</th>
<th>Goalpara</th>
<th>Barpeta</th>
<th>Nalbari</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Robi-Pre-kharif</td>
<td>26.18</td>
<td>NA</td>
<td>7.83</td>
<td>2.07</td>
<td>51.96</td>
<td>10.97</td>
</tr>
<tr>
<td>2</td>
<td>Summer paddy</td>
<td>33.15</td>
<td>7.03</td>
<td>9.87</td>
<td>12.58</td>
<td>23.03</td>
<td>19.32</td>
</tr>
<tr>
<td>3</td>
<td>Winter paddy</td>
<td>13.87</td>
<td>10.62</td>
<td>13.55</td>
<td>7.18</td>
<td>23.16</td>
<td>31.6</td>
</tr>
<tr>
<td>4</td>
<td>Autumn paddy</td>
<td>3.82</td>
<td>23.34</td>
<td>18.2</td>
<td>11.05</td>
<td>39.45</td>
<td>7.93</td>
</tr>
</tbody>
</table>


The chief characteristics of the pattern of agricultural land use in Western Assam is that food grains occupy a major portion of the total cropped area. Food crops consists of cereals like paddy and wheat. In Assam, agricultural landuse means the cultivation of soil for growing crops only, leaving insignificant areas for grass land, poultry farming, horticulture, piscicultur and dairy farming unlike in developed agricultural region of the world. Western Assam region is no exception from the above statement. The crops which individually occupy one percent or more of the total cropped area are considered to be the major crops of the region.

2.7 Transport and Communication:

The transport and communication system is not up to the desired level in the Western Assam. In Western Assam total road length is 85 km² of area in 2001 and the total length of road per lakh of population is 116 km as against 149 km for the state of Assam.

Although the national highway No 31 – (371 km.) and No 37 (101 km.) pass through the region most of the backward village, slum or char region – are even not linked with other places of the district with good motorable road (Map 2.6.1).

So far railway communication is concerned both broad-gauge and metregauge lines pass from west to east of Western Assam in the north and southern part. The total lengths of broadgauge and metregauge railway lines are 206 km and 195 km respectively in 2001-02.

Although there are many rivers in Western Assam at present water transport does not play any important role in the movement of people and goods except in the river Brahmaputra.
Goalpara—Bagbar, Jaleswar—Dhubri and Fakirganj—Dhubri are the places to cross the river by ferry and motor boat.

Rupshi (Dhubri) is the only air station in this district. Momai (near Goalpara town) was an air field in the past but now it is closed down. It may be mentioned that the transport and communication system although not well developed in the Western Assam, after independence the situation has been gradually improving. At present there has been an increase in the transport network and has been able to connect from backward areas to urban areas in Western Assam which happened within 10 years. The interior places are now connected by public bus services, auto rickshaw, minibus, rickshaw, trekker service as well as private and Assam state transport corporation buses. The connectivity of road network of the state of Assam itself being poor the connectivity of Western Assam is also not so developed the average connectivity being $\beta = 1.11$. Out of seven towns of Western Assam the best connectivity is found in Bongaigaon ($\beta = 1.25$) and lowest is of Barpeta town ($\beta = 1.05$). This $\beta$ index is correlated with the economy of Bongaigaon which is a commercially developed town of this part of Assam (Map 2.7.1).

2.8 Population:

Assam itself is a miniature replica of the Indian subcontinent, which shows diversity by its population also. The demographic profile of Western Assam with reference to Assam is discussed below.

The total population of Assam as per 2001 census is 26638407 of which 7074218 i.e. about 27 percent population is shared by Western Assam. This is a highly populated part. The total male and female population of Assam is 13787799 (51.75 percent) and 12850608 (48.25 percent) and of Western Assam is 3639366 (13.66 percent) and 3434852 (12.89 percent) respectively. The total urban population of Assam is 3389413 (12.72 percent) while Western Assam has an urban population of 584372 (2.19 percent). Assam is having urban male population of 1804642 (6.77 percent) and urban female population of 1584771 (5.94 percent) while Western Assam has 303228 (1.13 percent) and 281144 (1.05 percent) of urban male and female population respectively.
Assam is facing a formidable problem of alarming growth of population. The size of population in Assam has been increasing at a rapid rate. During 1991-2001 the growth rate of state of Assam was 18.85 percent while of Western Assam was 16.33 percent. The urban growth rate of Assam is 36.24 percent while of Western Assam is 29.16 percent as per 2001 census.

The density of population of Western Assam in 2001 was 450 persons per sq. km. as against the state average of 340 persons per sq. km.

The sex ratio of the state of Assam is seen to increase decade wise. During 1961 - 1971 it was 744, during 1971 - 1991 it was 838 and during 1991 - 2001 the sex ratio was 878 while of Western Assam the ratio was 765,894 and 926 respectively during these three decades.

According to 2001 census, scheduled castes and scheduled tribes population of Western Assam was 6.1 and 18.3 percent respectively as against the state percentage of 7.4 and 12.82

According to 2001 census the literacy rate of Western Assam is 57.77 percent of which male 65.95 and female 49.06 percent which is less as against then state literacy rate of 64.28 percent (male 71.93 and female 56.03 percent). The literacy rate of the towns of Western Assam is – Barpeta 80.1 percent (43.2 percent male and 36.91 percent female), Barpeta Road 73.66 percent (male 53.89 percent and female 31.25 percent), Bongaigaon 75.60 percent (male 41.91 and female 33.09 percent), Dhubri 73.90 percent (male 42.30 and female 33.09 percent), Goalpara 69.35 percent (male 40.80 and female 37.46 percent), Kokrajhar 79.23 percent (male 43.89 and female 35.34 percent) and Nalbari 79.26 percent (male 43.52 and female 35.74 percent).

Western Assam is inhabited by people of various religious groups like Muslim, Hindus, Sikhs, Christians, Buddhists, Jain etc.

There are two major group of languages in Western Assam- Assamese and Bengali, besides Hindi, Boro, Nepali etc. The most important feature of Western Assam is that increasing number of inhabitants, including the immigrants are seen to accept their mother tongue as
2.9 Economy:

Assam itself is one of the industrially backward states of the country of which again Western Assam part is more backward than the state. The economy of Assam as well as of Western Assam is depending too much on agriculture. In Assam cultivators and agricultural labourers constitute 51.24 percent and 12.89 percent of the total working population while of Western Assam it is 74.56 and 18.28 percent respectively. This indicates the large labour force in Western Assam. According to 2001 census, total number of main working force in Assam was 69,92056 of which 564018 male and 1351869 female and of Western Assam total main worker is 17,07735 of which 149124 male and 216311 female. Total worker of state of Assam is 36.37 percent of which 31.70 percent main worker, 4.67 marginal worker. Out of these percentage of worker 50.32 percentage male, 29.29 percent female and of main workers 47.55 male and 14.57 percent female. Of the marginal workers 2.77 percent are male and 6.72 percent female. This picture of working force if compared with that of Western Assam then it becomes clear that the total worker of Western Assam is 32.5 percent of which 49.06 percent male and 14.97 percent female. Main working force of Western Assam is 29.73 percent of which 47.06 percent male and 10.20 percent female. Marginal working force of Western Assam is only 3.69 percent of which 2.24 percent male and 5.25 percent female. The main workers are distributed under different categories of these cultivated worker of Assam is 51.24, agricultural labourer 12.89, household industry worker 2.50 and other worker 33.35 percent. But of Western Assam cultivated worker is more than state being 74.56 percent, household industry worker 2.72 and other 22.82 only.

The total main workers of urban centres of Western Assam is 4.95 percent of which male 4.76 and female 0.19 percent. The main workers includes – industry, cultivators, agricultural labourers, life stock, fishing-hunting, plantation, mining, manufacturing, processing, servicing and repairing in household industry, manufacturing processing, servicing and repairing in others, construction, trade and commerce, transport and communication and other services.
In the study urban centres means the towns of Dhubri, Kokrajhar, Bongaigaon, Goalpara, Barpeta, Barpeta Road and Nalbari. The marginal worker of urban centres of Western Assam is 0.017 percent and of which male 0.007 and female 0.010 percent only. The non-worker of Western Assam is 1.41 percent of which 0.58 and 0.53 percent are male and female respectively. All categories of workers are more in Dhubri town which is least in Nalbari town. The figures clearly indicates that female workers are more in urban centres of Western Assam than the male worker and contributes in the marginal work force.

The industries of Assam can be broadly classified into four heads – agro based, mineral based, forest based and other industries. Of the agro based industries Western Assam is having rice, oil and flour mills, jute mills, small food processing industry, textile industry, pati industry. Mineral based industries of Western Assam includes railway workshop, motorvehicle industry, cycle factory, alluminium utensil industry. Forest based industries of Western Assam includes – plywood industry, sawing mill, paper-pulp industry, match industry etc. Other industries include – power industry, printing press, brick and ‘tali’ (mud tiles) industry, ice industry, herbal medicine factory, beverage factory, terracota industry etc.

The main registered factories of Western Assam are enlisted below –

Agricultural hunting and related service activities - 2, Manufacturing of food products and beverages - 51, Textile - 3, Wood and wood products- sawing timbers - 60, Paper and pulp products - 1, refined petroleum products 2, chemical and chemical product-3, manufacture of other nonmetalic mineral products -17, fabricated metal products-2, machinery equipments-8, electricity, stream and hot water supply -7, repair of motor vehicle - 1, railway workshop - 1, refinery - 1. All these are mostly scattered in the main towns of Western Assam.

2.10 Important amenities:

Assam is backward in terms of basic amenities in comparision to the rest of the country, of which Western Assam part is more backward, than the rest of the state. Basic amenities include – medical, educational, recreational, and cultural facilities. Western Assam is having 6 civil hospitals, 54 hospitals, 183 primary health centre, 98 dispensaries. One
university (Kokrajhar campus under Gauhati University), 4 law colleges, 6 teacher training centres, 60 colleges (Arts, Science and Commerce), 26 junior colleges, 148 higher secondary, 1018 high schools, 2002 middle schools, 8684 primary schools and 33 preprimary schools. If recreational and cultural facilities are taken into account, Western Assam is having 29 cinema halls, 254 Auditoria-community halls, 28 public libraries, 4 stadia besides all these public fields, parks are also there in Western Assam. But these facilities are not enough in comparison to high density of population in this part of Assam, that too are mostly located in urban areas.
REFERENCES


Bhattacharyya, N.N. 1981. *Morphology of the towns of Assam with special Reference to the city of Guwahati*, Bhattacharyya, M.


Census of India 201. Population data of Assam, Directors of census of India.


