III. EXISTING CONDITIONS CONNECTED WITH AGRICULTURAL GROWTH
CHAPTER III

EXISTING CONDITIONS CONNECTED WITH AGRICULTURAL GROWTH IN THE NORTH EASTERN REGION

3.1. Introduction: The North-Eastern Region covers an area of 2.6 lakh square kilometres. It represents 8% of India's geographical surface and has 3.6 percent of the country's population. This region incorporates Assam, Meghalaya, Nagaland, Manipur, Tripura and Union Territories of Arunachal Pradesh and Mizoram.

Assam has an area of 78,523 square kms. It is comprised of nine districts, viz., Cachar, Darrang, Kamrup, Goalpara, Lakhimpur, Mikir Hills, North Cachar Hills, Nowgong and Sibsagar. Recently, Lakhimpur district has been divided into North Lakhimpur and Dibrugarh district. Mikir Hills district has been renamed as Karbi Anglong district.

Nagaland has an area of about 16,527 sq. kms. It is divided into three subdivisions, viz., Kohima, Mokokchung and Tuensang.

Meghalaya has an area of 22,489 sq. kms. It is comprised of five administrative districts, viz.,

1. According to 1971 Census, Series 1 - India.


Tripura has an area of 10,477 sq. Kms. It is divided into three subdivisions, viz., 1. North Tripural 2. South Tripura and 3. West Tripura.


The Union Territory of Mizoram, covering an area of 21,087 sq. Kms. is divided into three districts, viz., 1. Aizawl, 2. Lunglei and 3. Chhinzuipui.

3.1. Climatic condition: The North-Eastern region is hilly. The Garo, Khasi, Mikir, Naga, Mismi, Abar, Patkai and other hills occupy a large part of the region. Heavy rainfall has led to the growth of dense forest in many areas. Thus, the region has a variety of agro climatic conditions - tropical and sub tropical in the plains and temperate in the high hills. As such any generalisation
regarding the climatic condition of the whole region will hardly be possible for its micro zones.

3.1.A. Rainfall: In the North Eastern region rainfall is high and well distributed throughout the year in the month of December and January and in some case month of November also. The normal annual rainfall in Arunachal Pradesh is 3098 m.m. in Assam and Meghalaya 2360 m.m. and in Manipur Nagaland, Mizoram and Tripura is 2022 m.m.\(^3\) While Meghalaya holds the place of pride for having the world's highest rainfall receiving place, Arunachal Pradesh also has a good share. However, the seasonwise distribution of rainfall is not the ideal type in the entire region which is shown in the following table:

\(^3\) Statistical Abstract of India, 1975, Central Statistical Organisation, Govt. of India.
RAINFALL (SEASON WISE) IN THE N.E. REGION

(Actual) (Millimetres)

<table>
<thead>
<tr>
<th>Year</th>
<th>Arunachal Pradesh</th>
<th>Assam &amp; Meghalaya</th>
<th>Nagaland, Manipur, Mizoram &amp; Tripura</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kharif November to March</td>
<td>Kharif June to October</td>
<td>Rabi November to March</td>
</tr>
<tr>
<td>1973-74</td>
<td>257</td>
<td>332</td>
<td>144</td>
</tr>
<tr>
<td>1974-75</td>
<td>2288</td>
<td>114</td>
<td>1460</td>
</tr>
<tr>
<td>1975-76</td>
<td>231</td>
<td>79</td>
<td>1460</td>
</tr>
<tr>
<td>1976-77</td>
<td>2663</td>
<td>128</td>
<td>1553</td>
</tr>
<tr>
<td>1977-78</td>
<td>3243</td>
<td>233</td>
<td>1643</td>
</tr>
</tbody>
</table>


It should be mentioned here that due to heavy rainfall in the hill areas flood is very common in the plains areas mainly of Assam. The average monthly rainfall (in millimetres) seasonwise for different states of the north eastern region is shown in the following diagrams.
DISPERSION OF RAINFALL

ARUNACHAL PRADESH

- Average
- Monthly rainfall (in millimeters)

Kharif
Rabi

3.1. B. Humidity: As the distribution of rainfall is not the ideal type in the entire area, in the dry season a moisture deficit ranging from 9 to 60% is observed at various places. The average relative humidity in Meghalaya varies from 53% to 88% during the 12 months period. For Manipur, Tripura and Nagaland it varies from 67% to 84%, 65% to 86% and 49% to 85% respectively. Thus, although there is a broad climatic homogeneity throughout the region yet there are considerable local variations in rainfall, range of temperature and other phenomena like mist and fog.

3.2. Soils in the North Eastern Region:

There are seven main types of soils in the North Eastern region: the Alluvial soil, the Laterite soil, the Ferruginous Red soil, the Laterite and Lateritic soil, Forest soil, Mountain and Hill soil and the Mountain Meadow soil. For a better understanding of the variation of soil in different states of the North Eastern region it is necessary to discuss the properties of soil found in the North Eastern region. The old Alluvial soils, which are generally acidic in reaction, are suitable for production of wide variety of crops.


including rice, wheat, sugarcane, cotton, banana and tobacco. The Laterite soils, which are deficient in potash, phosphoric acid and lime, produce good crops particularly rice. The Ferruginous Red soils which are poor in lime, potash, iron oxide and phosphoric content, are suitable for cultivation of paddy and other crops. The Laterite and Lateritic soils which are generally poor in nitrogen, phosphate and potassium and organic matter, produce good crops particularly rice. Other soils like Mountain and Hills soils produce paddy and plantation crops after terracing. Mountain Meadow soils which occur above the timber line and below the snow line are suitable for forests. At places they produce potato and sub-tropical fruit.

As regards the variation of soils in the North Eastern region we find that the soils in the Assam Valley is broadly alluvial in character. In the fringes of the valley, particularly in Kamrup, Lakhimpur, Nowgong and Sibsagar district there are limited areas with lateritic soil. The acidic character of Alluvial soils make them very suitable for tea plantation, particularly in the Upper Assam Valley. The Ferruginous Red soils occupy the major part of Nagaland and the Laterite soils occupy a very little part of the state along the border of Sibsagar district of Assam. The flat land in the plains of Tripura is all through alluvial consisting
of sand, silt and clay in different proportion. But
the forest soils on tillas are generally loamy sand.
In Meghalaya there are three main types of soil. The
Hill soils occupy almost the entire state except a
limited tract in the foot hill. The Laterite soils
are confined to a small fringe and the old alluvium
is found in the high land areas bordering the plains,
all along the northern fringe of the state. The
central plain of Manipur being the flood plain of
rivers that drain it has thick deposits of sands and
clays, with their usual characteristic. The soils of
the Manipur hills are Ferruginous Red soils. The soils
of the Mizo Hills are usually similar to that of Mani-
pur Hills and are associated with a reddish loam. In
the major parts of Arunachal Pradesh, the Ferruginous
Red soils are found. The rocks are generally of the
Himalayan. Soils in the valleys are clayey alluvium
and rich in organic content.

Besides these main types of soils, the forest
soils are found in some parts of Assam, Tripura, Megha-
laya and Mizoram. The Mountain and Hill soils are
found in some parts of Assam, Manipur, Meghalaya,
Mizoram and Tripura. The Mountain Meadow soils are
found in some parts of Assam, Arunachal Pradesh and
3.3. **Population**: It is an admitted fact that the process of economic development of a country is retarded by the rapidly growing population. In India, the impact of rising population as a drag on economic resources is felt in a variety of ways. The North-Eastern Region is not an exception in this regard. As against the average population of 167 per square kilometre of the country, the density of population of Assam, Meghalaya, Nagaland, Tripura, Arunachal Pradesh and Mizoram is 186, 45, 31, 48, 149, 6 and 16 respectively. The density, decennial growth and sex ratio of 1971 population of each state of North-Eastern region is clear from the following table:

<table>
<thead>
<tr>
<th>State</th>
<th>Density</th>
<th>Decennial Growth</th>
<th>Sex Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam</td>
<td>186</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meghalaya</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagaland</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tripura</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arunachal Pradesh</td>
<td>149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mizoram</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State/Union Territory</th>
<th>Area (Sq.Kms)</th>
<th>Population (Persons)</th>
<th>Density (Persons)</th>
<th>Decennial Growth 1961-71 (Percentage)</th>
<th>Sex Ratio Females per 1000 Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arunachal Pradesh</td>
<td>83,578</td>
<td>467,511</td>
<td>6</td>
<td>33.91</td>
<td>861</td>
</tr>
<tr>
<td>Assam</td>
<td>78,523</td>
<td>14,623,152</td>
<td>186</td>
<td>34.95</td>
<td>896</td>
</tr>
<tr>
<td>Manipur</td>
<td>22,356</td>
<td>1,072,753</td>
<td>48</td>
<td>37.53</td>
<td>980</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>22,439</td>
<td>1,011,699</td>
<td>45</td>
<td>31.50</td>
<td>942</td>
</tr>
<tr>
<td>Mizoram</td>
<td>21,087</td>
<td>332,390</td>
<td>16</td>
<td>24.92</td>
<td>942</td>
</tr>
<tr>
<td>Nagaland</td>
<td>16,527</td>
<td>516,449</td>
<td>31</td>
<td>39.88</td>
<td>871</td>
</tr>
<tr>
<td>Tripura</td>
<td>10,477</td>
<td>1,556,342</td>
<td>149</td>
<td>36.28</td>
<td>943</td>
</tr>
<tr>
<td>Total</td>
<td>255,037</td>
<td>19,532,296</td>
<td>77</td>
<td>35.04</td>
<td>906</td>
</tr>
<tr>
<td>All India</td>
<td>3,280,483</td>
<td>547,949,309</td>
<td>167</td>
<td>24.30</td>
<td>930</td>
</tr>
</tbody>
</table>

Source: Census of India, 1971, Series - 1 - India.

The bulk of the population in this region is rural in character and the economy of the rural population is dependent on agriculture. The percentage of rural population, according to 1971 census, varies from 85.47 in Meghalaya, 86.85 in Manipur and 88.55 in Mizoram to 93.59 in Tripura, 96.15 in Arunachal Pradesh and 90.11 in Nagaland - average
for the region being 91.09 percent as against the all India average of 80.09 percent. Agriculture and allied activities constitute the main source of livelihood in this region. Of the total workers, the number dependent on agriculture is the largest in Mizoram (83.55%) followed by Arunachal Pradesh (80.00%), Nagaland (79.97%), Tripura (74.30%), Manipur (70.35%) and Assam (65.78%).

3.4. Methods of cultivation: The age-old farming system known as shifting cultivation or 'jhuming' still predominates in most of the hill areas of the North Eastern region. Shifting cultivation or jhuming can be defined as an agricultural system in which fields are cleared by firing and are cropped discontinuously. The clearings are abandoned for some reasons or the other after sometimes. Then, the cultivations shift to another clearing, leaving the old one for natural recuperation. Depending upon the agro-climatic conditions and the need and food habits, a variety of crops is grown. This method of cultivation has some serious defects, viz., it depends totally on natural rainfall and top soil is removed by the steepgradient revults for the absence of natural rainfall vegetation. Moreover, after two or three years of

7. Census of India, 1971, Series 1, India.
cultivation the jhum field gets overgrown with weeds, becomes unsowable and, therefore, a fresh jungle is to be cleared.

The North Eastern region has a large area under shifting cultivation. Out of a total reporting area of about 227.35 lakh hectares, 26.95 lakh hectares are available for shifting cultivation. Of this, area available for shifting cultivation in Arunachal Pradesh is 2.48 lakh hectares, in Manipur 1.00 lakh hectares, in Meghalaya 4.16 lakh hectares, in Mizoram 6.04 lakh hectares, in Nagaland 6.08 lakh hectares and 2.21 lakh hectares in Tripura.

Percentage of total population (1971) dependent on shifting cultivation is 0.48 in Assam, 27.95 in Manipur (hills), 34.58 in Meghalaya, 6.42 in Tripura, 57.69 in Arunachal Pradesh and 80.74 in Mizoram.

Thus, the pattern of agriculture of Tripura and Assam show an appreciable deviation from tradition of jhuming which is most popular in the rest of the states of the North Eastern region. The shifting

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cultivation is confined to hills only in these two states, while most of the plain areas are under permanent cultivation.

In other hill states of the North Eastern region, most of the tribals practise jhuming resulting in soil erosion and reduction of fertility. Moreover, the cycle of jhuming also differs from area to area with the proportion of land put in for cultivation. Wadia (1977) has said that due to increasing population jhuming cycle varies between 1 to 17 years in Arunachal Pradesh, 4 to 5 years in Meghalaya, Mizoram and Tripura, 5 to 10 years in Assam Hills, 6 to 8 years in Manipur and 6 to 15 years in Nagaland. Wadia also has observed: "Where the land belongs to a community or clan, jhum appears to be little interest on the part of individual tribal family to improve the productivity of the crops or the fertility of the soil". 10

In hill areas at places terraced cultivation has developed. The method of preparing land for cultivation is to dig and build the side of the hill into terraces. Each terrace cannot have its own channel and usually obtains water either from the terrace above it or from one of the terraces in the same row, the terraces being so carefully graduated that the water may flow from terrace to terrace. This method of

cultivation is rather traditional.

Thus, in most of the hill areas of North-Eastern region, the shifting cultivation or jhuming is prevalent. The crop pattern varies from the higher jhum land to the lower plain strips. The crop intensity of the North Eastern region is shown on the following map:
3. **Major crops**: The bulk of the cultivated area in the North Eastern Region is devoted to the production of food crops, mainly rice, as shown in the following table:

<table>
<thead>
<tr>
<th>State/Union</th>
<th>Area under total foodgrains</th>
<th>Area under cultivation of rice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arunachal Pradesh</td>
<td>117.9</td>
<td>79.0</td>
</tr>
<tr>
<td>Assam</td>
<td>2,458.0</td>
<td>2,252.6</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>128.5</td>
<td>106.6</td>
</tr>
<tr>
<td>Manipur</td>
<td>197.5</td>
<td>179.1</td>
</tr>
<tr>
<td>Mizoram</td>
<td>97.3</td>
<td>93.1</td>
</tr>
<tr>
<td>Nagaland</td>
<td>105.4</td>
<td>69.5</td>
</tr>
<tr>
<td>Tripura</td>
<td>314.3</td>
<td>305.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,139.0</strong></td>
<td><strong>3,085.1</strong></td>
</tr>
<tr>
<td><strong>All India</strong></td>
<td><strong>127,133.0</strong></td>
<td><strong>40,001.4</strong></td>
</tr>
</tbody>
</table>


Besides rice, in Meghalaya a significant proportion of cultivable area is under production of maize, potato, vegetables, chillies, sweet potato, millets etc. These are grown particularly in the higher slopes as subsidiary food crops. A considera-
ble area is also devoted to high land paddy. In Garo hills of Meghalaya the most important crops next to rice is cotton.

In Assam, next to rice comes tea which occupies a large area. The minor crops like jutes, sugarcane, tobacco etc. occupy a small place.

So far as the Union territory of Arunachal Pradesh is concerned, the main crops are rice, maize, millets and mustard. In Mizoram maize and paddy are cultivated in hill slopes.

In Tripura next to rice jute, oil seeds and cotton give satisfactory yields. In Nagaland, besides rice, paddy and vegetables are also grown.

Among the crops grown in Manipur paddy occupies the top position both in the valley and in the hills. Among the crops of lesser importance mention may be made of wheat, mustard and pulses.

Thus, a study of the trend of production of major crops of the North Eastern region reveals that though the region takes a homogeneous character with rice occupying the bulk of the area of agricultural landscape, there is a good deal of regional variation in the cultivation of secondary crops. As a result this region is typical of an underdeveloped agricultural economy in which most of the cultivated area is devoted to almost
subsistence crops, mainly for local consumption and the immediate market.