

## Chapter IV

### 4.1: Geographical Location of Assam

This chapter briefly narrates the geographic, demographic and socio-economic features of the Assam. Assam is located between 24°08' N - 27°05' N latitude and 89°42' E - 96°01' E longitude. The state is a central part of north-eastern India comprising total area of 78,438 sq. km. The state is bounded by Arunachal Pradesh in the east, West Bengal, Meghalaya, Bangladesh in the west; Arunachal Pradesh, Bhutan in the north and Nagaland, Manipur, Mizoram, Tripura in the south. The Brahmaputra is one of the biggest rivers of the world and passes through Assam. This river is also known as the Tsangpo in Tibet (China), the Siang or Dihang in Arunachal Pradesh, the Brahmaputra in Assam and the Jamuna in Bangladesh. Barak is the second largest river that flows in Assam. The Barak rises from the southern slope of the lofty Barail Range near the border of Manipur and Nagaland and forms a part of the northern boundary of the Manipur State with Nagaland where it is known as Kirong. The whole Assam is classified into six agro-climatic zones comprising of 27 districts. Assam covers 35.27 percent of forest to the total geographical land. The main seasons of Assam are monsoon, pre-monsoon and winter season.

#### 4.1a: Climate of Assam

Assam has a sub-tropical monsoon climate with the temperature going up to 36 °C in August to lowest 7 °C in the month of January. The cool season generally lasts from October to February and is marked by heavy to light fog and few brief showers. The state escapes the normal Indian hot and dry seasons. Although some rain occurs from March through May, the heaviest precipitation comes with the southwest monsoon, which arrives in June, stays through September, and often causes widespread and destructive flooding. The state receives annual average rainfall of 774 mm, where in the month of April, May and June receives highest rainfall.

#### 4.1b: Population of Assam

According to 2011 census report, Assam has a total population of 31, 169,272 out of which male and female comprises 15,954,927 and 15,214,345 respectively which accounts only 2.58 percent of India's population. Assam ranks 14<sup>th</sup> position amongst all the states of India in terms of density of population i.e. 397 persons per square km. The decadal growth rate of population

in the state is 16.93 percent. The sex ratio is female is 954 per thousand male, which is better when compared to the all India level of 940 female per thousand male.

#### **4.1c: Literacy Rate of Assam**

Proper education is one of the most important keys for development of an individual and the society. According to the census report 2011, the total literate population in the state is 73.18 percent. Female literacy is lower (67.27percent) compared to male (78.81percent). But female literacy rate has increased from 54.61 percent in 2001 to 67.27 percent in 2011. Thus, the future holds a lot of promises in the education sector of the state.

#### **4.1d: Agriculture sector of Assam**

Agriculture sector is the backbone of Assam economy, which contributes almost 20 percent to the state GDP and engages 75 percent of population. The major cultivated crop is rice, followed by wheat, pulses, oilseeds, jute, sugarcane, vegetables, fruits etc. Although regular floods, drought, heavy population pressure on land and infrastructural weakness are the major impediments towards the growth of agriculture sector in the state. The main areas in upcoming days for modernizing/ developing state's agriculture sector is should be the introduction of modern technology to boost up the productivity by the Assam state government. Agro-based industries like diary, fishery, floriculture and horticulture also hold immense scope and their development would open up avenues for youth participation in the agricultural sector.

#### **4.1e: Economy of Assam**

Assam is mainly an agrarian economy where 75 percent of the population is engaged in agriculture and allied activities directly or indirectly. Total cultivable land is 35 lakh hectares and 78 percent of it cultivates only cereals. Assam is one of the industrially backward states of the country. In spite of being blessed with a high potential for development of resource-based and demand-based industries, the pace of industrialization in Assam has not been satisfactory. Only in few sectors like tea, petroleum, coal, jute and forest the industrial sector has been centralized

The main industry of Assam is tea that is cultivated in 230 lakh hectares of land in Assam. Assam tea is exported abroad and the government has been earning substantial amount of foreign exchange from the tea production. Moreover there are a number of cottage and small-

scale industries such as- handloom, bamboo, cane, brass and bell metal industries. There are 848 tea gardens in the state, which accounts for 11 percent of the state's income.

Also one of the most famous industries of Assam is the silk industry situated in Suwalkuchi area in Kamrup district. The Assam silk is exported all over the world. It is one of the biggest small-scale industries of Assam. The state has the potential for power generation but sadly this has remained untouched.

#### **4.2: Cachar District**

Cachar district is located between 24° 22' N & 25° 08' E latitude and 92° 24' E & 93° 15' E longitude. Cachar is bounded in the north by the north Cachar hill district, on the east by Manipur, south by Mizoram and on the west it shares the national border with Tripura and international border with the Sylhet district of Bangladesh. The river Barak flows from east to west through the middle of the plain valley. The District comprises a total area of 3,786 sq. km comprising forest area of 59 percent of the total geographical area. Presently the state is the gateway to Manipur and Mizoram, but after opening of broad-gauge railways and Mahasadak, Silchar will become one of the centres for business in the northeastern states. According to 2011 census, the total population in the district is 1,736,319 which comprise 886,616 males and 849,703 females respectively. The literacy rate of the district is 80.36 percent of which male comprise 85.85 percent and female 74.62 percent as per 2011 census.

The district receives an annual average rainfall of 812.5 mm and the temperature ranges from maximum of 38°C during summer hot days to minimum of 11°C during the winter cold days. The district is highly humid and it suffers regularly from natural disasters like the hail storm and floods. The types of soil available in the district are non-laterised red soil, old mountain alluvium, old riverine alluvium, lateric red soil and peat soil.

The major rural population of the district directly and indirectly depends on Agriculture. This sector contributes 17 percent to the district gross domestic product. The main agricultural crops cultivated in the district are rice, wheat, pulses, oilseeds, sugarcane, jute and horticulture crops including fruits and vegetables. The gross crop area is 152.83 ('000) hectare during 2010-11, where the cropping intensity is 122 percent which refers that the state grows less than two crops in a year. Irrigation facility has been found very poor in the districts, where only 0.77 percent of gross cropped area has come under irrigation and the rest 99.23 percent comes under the rain fed cultivation. In the district during 2010-11 the highest productivity receive from horticulture

sector has been 6654.96 kg per hectare, followed by sugarcane 4250 kg, rice 2033 kg, jute 1200 kg and wheat 1070 kg per hectare. The other field crops like pulses, oilseeds and maize achieved the yield rate between 570 to 500 kg per hectare in the district.

#### **4.3: Kamrup District**

Kamrup district is situated between 25 0 44' N - 26 0 51' N latitude and 90 0 56' E - 92 0 10' E longitude with the geographical area of 6882 square km, where the forest covers 32.98 percent of the district. It is surrounded in north by Udalguri and Baksa District, in the east by Darrang, west by Goalpara and Nalbari District and south by Meghalaya. The district has the population of 1,517,202 which comprises 779,608 male and 737,594 female respectively. The census 2011 shows that the population density of Kamrup district is 420 people per sq. km. and the literacy rate of the district is 72.81 percent comprising of 77.64 percent male and 67.69 percent female respectively.

The district receives an annual average rainfall of 1796 mm and the temperature ranges from maximum 38°C during summer hot days and minimum of 7°C during the winter cold days. The district suffers regularly from natural disasters like hail storm, floods and drought. The types of major soils available in the district are new alluvium soil and old alluvium soil. The economy of rural population directly and indirectly depends on the agricultural sector, where it contributes 14 per cent to the district gross domestic product. The main agricultural crops which are cultivated in the district are rice, wheat, pulses, oilseeds and horticulture crops including fruits and vegetables. The gross cropped area was 211.43 ('000) hectare during 2010-11, where the cropping intensity was 120 percent which implies that the state grows less than two crops per year. Irrigation facility has been found very poor in the districts, only 1.09 percent of total gross cropped area has come under irrigation and the rest 98.91 percent comes under the rain fed cultivation. In the district during 2010-11, the highest productivity received from horticulture sector was 22022 kg per hectare, followed by rice 1475 kg, wheat 1872 kg, pulses 573kg and oilseeds 556 kg per hectare. The performance of horticulture crops was found very encouraging in the district.

#### **4.4: Sibsagar District**

The district covers a total geographical area of 2668 sq. kms, where 26 percent of it comes under forest. The district is situated between 26.450 to 27.150 N latitudes and 94.250 to 95.25' E altitudes. It shares its border with Dibrugarh district from east, Jorhat in the west, river

Brahmaputra in the north and Arunachal Pradesh in the south. According to the 2011 census Sibsagar has the total population of 11, 50,253, comprising of 5, 89,454 males and 5, 60,799 females. The sex ratio is 951 per thousand male and the population density is 431 people per sq. km. as reported in 2011 census in the district. Besides, the literacy rate of Sibsagar is 81.36 percent of which male were 86.75 percent and female 75.69 percent respectively.

The district receives an annual average rainfall of 1478 mm and the temperature ranges from maximum of 37<sup>0</sup>C during summer hot days and minimum to 9<sup>0</sup>C during the winter cold days. The district suffers regularly from natural disasters i.e. floods. The types of major soils available in the district are recent alluvium soil (entisol) and old alluvium soil (inseptisol). In the district the agriculture sector contributes 14 percent to the gross domestic product. The main agricultural crops which are cultivated in the district are rice, wheat, pulses, oilseeds, jute, sugarcane and horticulture crops including fruits and vegetables. The gross cropped area was 155.26 ('000) hectare during 2010-11, where the cropping intensity was 134 percent which implies that the state grows less than two crops per year. Irrigation facility has been found to be very poor with only 2.49 percent of total gross cropped area under irrigation and the rest 97.51 percent under the rain fed cultivation. In the district during 2010-11 the highest productivity was receive by sugarcane with 60000 kg per hectare, followed by jute 10147 kg, horticulture crops 6285 kg and rice 2630 kg per hectare. The other field crops like wheat, oilseeds and pulses achieved the yield rate between 700 to 641 kg per hectare. The performance of sugarcane and jute was found very encouraging in the district.

#### **4.5: Darrang District**

Darrang district occupies geographical area of 3,481 square kilometers, where forest covers 13.5 percent. Geographically it shares the international border with Bhutan and national border with Arunachal Pradesh. According to the 2011 census the total population of Darrang district was recorded 9,08,090 out of which 4,72,134 are males and 4,35,956 females. Sex ratio in the district is 923 females per 1000 males and the population density has been found to be 491 people per square kilometer. Again, the literacy rate of the district was 64.55 percent where male literacy rate comprised of 68.36 percent and female literacy rate 60.40 percent.

The district receives an annual average rainfall of 1951 mm and the temperature ranges from maximum of 36<sup>0</sup>C during summer hot days and minimum of 9<sup>0</sup>C during the winter cold days. The district occasionally suffers from natural disasters such as floods and drought. The types of major soils available in the district are sandy loam, clay loam and silty clay loam. The economy

of the Darrang district is basically agrarian where the majority (about 85percent) of the population is engaged in agriculture and allied activities. The agricultural sector shares 22 percent to the district gross domestic product. The main agricultural crops cultivated in the district are rice, jute, pulses, wheat, sugarcane and horticulture crops including fruits and vegetables. In the district the reported gross crop area was 132.72 ('000) hectares during 2010-11, where the cropping intensity was 180 percent which implies that the state grows almost two crops per year. In the district, the area under irrigation facility has been found to be 19.64 percent of gross cropped area and the rest 80 percent rain fed cultivation. In the district during 2010-11, the highest productivity was received by sugarcane with 35793 kg per hectare, followed by horticulture crops 12466 kg, rice 2857 kg, jute 2060 kg, wheat 982 kg per hectare respectively and lowest yield rate was received by pulses i.e.544 kg per hectare. In the district the performance of sugarcane and horticulture was found very encouraging.

#### **4.6: Tinsukia District**

Tinsukia district of Assam covers geographical area of 3790sq.kms, where forest covers 40 percent. Tinsukia district is situated between 27023/ to 27048/ N latitude, 93022/ to 95038/ E longitude and 147.83 – 184.3 m altitude. The district is bounded by Arunachal Pradesh, Dibrugarh and Dhemaji district, which is separated from Tinsukia district by the mighty river Brahmaputra. According to 2011 census, Tinsukia has the population of 1,316,948 where males and females are 675,986 and 640,962 respectively. The report showed that population density of Tinsukia district was 347 people per sq. km. Meanwhile, sex ratio was 971 female per 1000 male in the district. Literacy rate of Tinsukia was 70.92 as compared to 60.95 during 2001 census. Also the male and female literacy rates were 77.89 and 63.54 percent respectively.

The district receives an annual average rainfall of 535.75 mm and the temperature ranges from maximum of 32<sup>0</sup>C during summer hot days and minimum of 8<sup>0</sup>C during the winter cold days. The district regularly suffers from drought and occasionally suffers from floods and hailstorms. Major types of soils available in the district are red soil, sandy soil, sandy loam, and sandy clay.

Digboi Refinery is the major industry existing in the district, which plays an important role in shaping and developing the economic status of the district. The agricultural sector is the backbone of the rural economy, which shares approximately 15 percent to the district gross domestic product. The main agricultural crops cultivated are rice, maize, wheat, oilseeds, pulses and horticulture crops including fruits and vegetables. The recorded gross cropped area was 145.2 ('000) hectare during 2010-11, where the cropping intensity was 145 percent which

implies that the state grows less than two crops per year. In the district the area under irrigation facility has been 4.3 percent of the gross cropped area and the rest 95.7 percent were under the rain fed cultivation. In the district during 2010-11, the highest productivity was received by horticulture crops with 15947 kg per hectare, followed by rice 1818 kg, wheat 1325 kg, maize 680 kg, pulses 667 kg per hectare respectively and lowest yield rate was received by oilseeds i.e. 596 kg per hectare. In the district the performance of horticulture sector has been found very encouraging.

#### **4.7: Dibrugarh District**

Dibrugarh district of Assam has covered geographical area of 3381 sq.kms, where forest covers 22 percent of it. Dibrugarh District is situated in between 27° 5' 38" N to 27° 42' 30" N latitude, 94° 33' 46" E to 95° 29' 8" E longitude and 99m to 200m altitude. The district is surrounded by Dhemaji district and a part of Lakhimpur district in the north, part of Sibsagar district and Arunachal Pradesh in the south, Tinsukia district in the east and Sibsagar district in the west. The Brahmaputra River flows in the north from the district. According to 2011 census, Dibrugarh has the population of 1,327,748 of which male and female are 680,114 and 647,634 respectively. Density of population has been found to be 390 people per square kilometer in the district and with regards to sex ratio, it was found to be 952 per 1000 male. While, literacy rate of Dibrugarh in 2011 census was 76.22 percent compared to 68.96 percent during 2001. Also the literacy rate of male and female were 82.59 and 69.52 percent respectively in the district as per the 2011 census.

The district receives an annual average rainfall of almost 693 mm and the temperature ranges from maximum of 35°C during summer hot days and minimum of 8°C during the winter cold days. The district regularly suffers from floods and occasionally suffers from drought. The types of major soils available in the district are clay, clay loam, sandy soil and sandy loam.

In the district tea and oil industry are the major revenue earners, while agriculture plays an important role in the rural economy. The total workforce was found to be 4, 72,419 and out of which 1, 37,008 (29%) are cultivators and 35,862 (7.59%) are agricultural labourers while and rest (63.41%) are non-agricultural labourers who are engaged in tea industry, household industry & other works. Thus, the census report 2011 showed that 36.6% of the work forces were directly engaged in agriculture. While, the agriculture sector shares approximately 17 percent to the district gross domestic product the main agricultural crops cultivated in the district are rice followed by pulses, oilseeds and horticulture crops including fruits and

vegetables. The recorded gross crop area was 188.69 ('000) hectare during 2010-11, where the cropping intensity was 148 percent which implies that the state grows less than two crops per year. In the district the area under irrigation facility has been found to be 7.4 percent of gross cropped area and the rest 92.6 percent rain fed cultivation. In the district during 2010-11, the highest productivity was received by horticulture sector with 7614 kg per hectare, followed by rice 1800 kg, oilseeds 600 kg, maize 680 kg per hectare respectively and lowest yield rate was received by pulses with only 450 kg per hectare. In the district the performance of horticulture sector has been found very encouraging.

#### **4.8: Lakhimpur District**

Lakhimpur district occupies an area of 2,277 square kilometers, where forest covers 12.5 percent. Lakhimpur District is situated between 26<sup>0</sup>45 & 27<sup>0</sup>35 N latitudes, 93<sup>0</sup>40 & 94<sup>0</sup>53 N latitude and 102 above MSL altitude. It is surrounded in the north by lower Subansiri and Papumpare districts of Arunachal Pradesh and on the east by Dhemaji district, river-island Majuli in the south and Gohpur sub-division of Sonitpur District in the west. According to the 2011 census Lakhimpur district has population of 1,040,644 of which male and female are 529,674 and 512,463 respectively. The sex ratio has been found to be 965 females for every 1000 males. The district has a population density of 457 people per square kilometer. Literacy rate of Lakhimpur in 2011 was 78.39 percent as compared to 68.56 percent in 2001 and male and female literacy rate were 84.66 and 71.91 percent respectively.

The district receives an annual average rainfall of almost 761 mm and the temperature ranges from maximum of 35<sup>0</sup>C during summer hot days and minimum of 9<sup>0</sup>C during the winter cold days. The district regularly suffers from floods and occasionally suffers from drought. The types of major soils available in the district are sandy soil, sandy loam and other type of soil.

Economy of Lakhimpur is mainly based on agriculture, with the contribution of 38 percent to the district gross domestic product. Few small-scale and medium-scale industries are also located in the district. The ongoing lower Subansiri hydropower project (2000 MW) is a ray of hope for the industrial development in this district. Major cultivated crops in the district are rice, oilseeds, pulses and horticulture crops, which include fruits and vegetables. The recorded gross crop area was 214.32 ('000) hectare during 2010-11, where the cropping intensity was 145 percent which implies that the state grows less than two crops per year. In the district the area under irrigation facility has been found to be 4.8 percent of gross cropped area and the rest 95.3 percent has been rain fed cultivation. In the district during 2010-11 the highest



productivity has been received by horticulture sector with 25279 kg per hectare, followed by rice 2469 kg, oilseeds 575 kg per hectare respectively and lastly, the lowest yield rate has been received by pulses i.e. 485 kg per hectare. The performance of horticulture sector and rice production has been found very encouraging.

#### **4.9: Nagaon District**

The district covers an area of 3993 Sq. Km., where forest share 20.78 percent of the total geographical area. The district extends between 26° N latitudes, 90°45/E longitudes and 50.2 m above MSL altitude. In the north, Nagaon is bounded by Sonitpur district and the Brahmaputra river, towards south lies west Karbi Anglong and North Cachar Hills, towards east lies the districts of east Karbi Anglong and Golaghat. In 2011, Nagaon had population of 2,823,768 of which male and female comprise of 1,439,112 and 1,384,656 respectively. The district has a population density of 711 people per square kilometre. Its population growth rate over the decade i.e. 2001-2011 has been 22.09 percent. Nagaon has a sex ratio of 962 females for every 1000 males. The literacy rate of Nagaon district was 73.78 percent where male literacy rate was 78.19 percent and female literacy rate 69.21 percent respectively.

The district receives an annual average rainfall of almost 700 mm and the temperature ranges from maximum of 36°C during summer hot days and minimum of 10°C during the winter cold days. The district regularly suffers from drought and floods and occasionally suffers from cyclone and hailstorm. The types of major soils available in the district are clay loam, sandy loam, tilla/ red, clay and sandy soil.

Nagaon district is known as the 'rice bowl' of Assam. Economy of Nagaon district, in terms of natural resources endowment is purely agrarian. In fact, agriculture is the backbone of the entire economy of this district as this sector provides livelihood to almost 78 percent of the total population. Rice is the staple food of the inhabitants and is the principal crop cultivated in the district. Other crop that are cultivated in the districts are wheat, pulses, oilseeds, sugarcane and horticulture crops including fruits and vegetables. The agriculture sector contributes 28 percent to the district gross domestic product. Floods, however, are a major obstruction in the development of this sector. Besides agriculture, economy of Nagaon district also includes another major sector that is fishery.

The recorded gross cropped area was 271.29 ('000) hectare during 2010-11, where the cropping intensity was 192 percent which implies that the state grows almost two crops per year. In the

district the area that comes under irrigation facility has been found to be 23.33 percent of gross cropped area and the rest 76.67 percent rain fed cultivation. In the district during 2010-11 the highest productivity has been received by sugarcane crop with 35794 kg per hectare, followed by horticulture 12466 kg, rice 2610 kg, wheat 984 per hectare respectively and lowest yield rate has been received by pulses and oilseeds with 535 and 665 kg per hectare respectively. In the district the performance of sugarcane, horticulture and rice has been found very encouraging.

#### **4.10: Karbi Anglong District**

It district covers a total area of 10,434 sq. km, where forest covers 76 percent. The district has dense tropical forest which covers hills and flat plains and it is situated between 25° 33' N to 26°35' N Latitude, 92°10' to 93°50' E Longitude and 100m – 1400m altitude. It is bounded by Golaghat district in the east, Meghalaya and Morigaon district in the west, Nagaon and Golaghat district in the north and N.C. Hills district and Nagaland in the south. As per the census report of 2011, the total population of Karbi Anglong district was 9, 65,280 where the male population was 4, 93,482 and the female population 4, 71,798 and the literacy rate was 73.52 percent of which 82.12 percent are males and 64.62 percent are females respectively.

The district receives an annual average rainfall of almost 1205 mm and the temperature ranges from maximum of 36°C during summer hot days and minimum of 9°C during the winter cold days. The district moderately suffers from floods and drought. The types of major soils available in the district are clay loam, sandy and sandy loam.

The economy of Karbi Anglong is mainly based on agriculture, and this sector contributes 32.8 percent to the district gross domestic product. The traditional methods of Jhum cultivation is commonly practice by the farmer in this district. Major cultivated crops in the district are rice, maize, oilseeds, sugarcane and horticulture crops, which includes fruits and vegetables. The reported gross crop area was 227.6 ('000) hectare during 2010-11, where the cropping intensity was 129 percent which implies that the state grows less than two crops per year. In the district the area under irrigation facility has been found to be 3.6 percent of gross cropped area and the rest 96.4 percent has been rain fed cultivation. In the district during 2010-11 the highest productivity was received by sugarcane with 52428 kg per hectare, followed by horticulture crops 10983 kg, rice 2975 kg and maize 2207 kg per hectare respectively and lowest yield rate was received by oilseeds i.e. 734 kg per hectare. In the district the performance of sugarcane and horticulture sector has been found very encouraging.

#### **4.11: N. C. Hills ( Dima Hasao)**

The total area of the district is 4888 Sq. km. where the forest covers 87 percent of the total geographical area. It is surrounded in the east by Manipur and Nagaland, in the west by Meghalaya and Karbi Anglong, north by Karbi Anglong and Nagaon and in the south by Cachar. According to 2011 census, N. C. Hills has population of 213,529 of which comprise males and females of 110,566 and 102,963 respectively. The census report 2011 shows that the population density of the district is 44 people per sq. km. Literacy rate of N. C. Hills has been found to be 78.99 percent and if we looked gender wise then the male and female literacy has been found to be 85.34 and 72.15 percent respectively as per 2011 census report.

The district receives an annual average rainfall of almost 1800 mm and the temperature ranges from maximum of 33<sup>0</sup>C during summer hot days and minimum of 7<sup>0</sup>C during the winter cold days. The district moderately suffers from drought. The types of major soils available in the district are fine silty and fine loamy soil.

The main staple food of the district inhabitants is rice and about 70 percent of the total cultivated area is under Jhum cultivation. This cultivation is done in autumn season either as a single crop or sometimes as mixed crop along with rice, maize, ginger, turmeric, chillies, vegetables etc. Some horticultural crops viz. pineapple, orange, papaya and banana plays vital role in boosting the agricultural economy of the district. Livestock and Poultry occupy an important place in the rural economy of the district. The common livestock animals, which are found in the districts, are buffalo, pig, hen, duck etc. The major forest products consist of timber, cane, bamboo etc. Here, the agriculture sector contributes 20 percent to the district gross domestic product.