Chapter 2

GEOGRAPHY AND CLIMATE OF THE AREA UNDER STUDY

Physical Features:
The North Eastern India including Assam is of special biogeographical interest. The total geographical area of North East region covers an area of 2, 55037 sq. km sharing about 8 % of the total area of the country. It has total forest covered area of about 47 % of the total geographical area. It represents 50 % of the total flora of Indian subcontinent. The state of Assam is composed of three physical divisions, namely, the Brahmaputra valley, the Barak valley and the hill range. The Barak valley region is situated between Longitude 92°15’ and 93°15’ East and Latitude 24°8’ and 25°8’ North, covering an area of 6922 sq.Km. and is located in Southern Assam, North-East India. The valley constitutes 8.9 percent of the geographical area of the state. The region shares its borders with North Cachar Hills district and the state of Meghalaya in the North; the state of Manipur in the East; the state of Mizoram in the South and the state of Tripura and the Sylhet district of Bangladesh in the West. The region is composed of three districts, namely Cachar, Karimganj and Hailakandi. Cachar is the largest district with total geographical area of 3786 sq.Km. the valley has an undulating topography characterized by hills, hillocks (locally known as tillah), wide plains and low-lying waterlogged areas (locally called beels) (Roy and Bezbaruah, 2002).

Climatic Features of Barak Valley: The climate of Barak Valley is sub-tropical, warm and humid.

Rainfall: the average rainfall of this area is 3180 mm with average rainy days of 146 per annum. There are three rainfall zones in Barak Valley, which are as follows:
1. High rainfall zone: the North-Western part of the Barak Valley bordering Meghalaya is high rainfall zone, including of high hill areas. The average rainfall of this area is above 4000 mm.
2. Moderate Rainfall Zone: It covers the largest area of the Barak Valley. It spreads over the middle of the region from the high hills in the North and North-East to Bangladesh border in the West. The average rainfall of this area is between 3000-4000 mm.

3. Low Rainfall Zone: The average rainfall of this area is below 3000 mm. It is the area that lies in the south of the previous zone and covers the entire Southern part from Manipur border in the East to Tripura border in the West which comprises the Southern part of Hailakandi district bordering Mizoram.

Karimganj district records the highest rainfall of 3694 mm per annum, followed by Cachar with 2910 mm, while Hailakandi records the lowest rainfall of 2329 mm per annum.

Generally, the climate of the Barak Valley from December to February is rather dry and the low erratic rainfalls with occasional hailstorms are abundant from March to April and October to November. The high rainfall with apprehension of floods is almost annual occurrence in the period between May to September. Though the total annual rainfall in all the three districts of the zone is adequate, yet the distribution of rainfall is not uniform and about 56 % of the total rainfall is confined to the period between June to August.

**Temperature:** In the Barak Valley, the minimum temperature ranges are 12.2° C in January to 35.4° C in August. The temperature range is moderate and winter is less severe than in other parts of the state.

In Cachar district, the maximum and minimum temperature is 35.8° C and 15.1° C respectively. In Hailakandi district, the maximum and minimum temperature is 31.8° C and 15.1° C and in Karimganj district, the average temperature ranges from 30°-36° C during summer and 10°-20° C during winter.

**Relative humidity:** Generally, in the morning, relative humidity is higher (above 90 %) than in the afternoon time due to foggy weather in the winters. But monthly variation in relative humidity is lesser in the morning ranging from 92 %- 98 % than
that in the afternoon varying from 43 % to 78 %. In Cachar district, the humidity ranges from 75 % to 80 %. In Karimganj, humidity ranges from 62.86 % to 80.07 %.

SOIL TYPE OF BARAK VALLEY:

Geologically, the Barak Valley as a whole is younger than the Brahmaputra Valley. It is entirely alluvial in origin and is composed of pebbles, sand, silt, clay and sometimes a mixture of sand and clay containing decomposed vegetable matter. The soil in general has a dark brown (10 yr, 4/3) to yellowish brown (10 yr, 5/6) and red subsurface based on the Munsell soil colour chart variability does not exist depending on the level of degradation, type of vegetation, etc.

The Bhuban hill formation dates back to Miocene epoch (about 15 million years ago). Investigation revealed the presence of marine fossils in the form of casts of Bryozoa colonies. All these findings indicate that this area was possibly part of a shallow sea and its coastline during the Miocene epoch some 15 million years ago (Dutta et al., 1998). The ph of the soil ranges from 4.5 to 6. The rock is predominantly sand and clay shales. On the basis of Geomorphological studies, the Barak Valley zone is divided into six units, viz- Alluvial flood-free, Alluvial flood plain, Surma group, Tipan group, Duaitila group and beels.

There are some major soil classes in the Valley:

a) Old riverine alluvium soil: This type of soil is mainly confined to the banks of Barak and Kushiara rivers. The texture of this type of soil varies from sandy to fine silty loam type.

b) Old mountain alluvium soil: This type of soil occurs in broad meander plains and undulating plains bordering the old riverine alluvium. This type of soil is formed from the sedimentary rocks like sandstone, shale and sandy shale. The texture varies from sandy type to clay.

c) Non-laterised soil: The entire alluvial region is surrounded almost on all sides by non-laterised red soil and this type covers the largest area of the Valley.
d) Laterised red soil: This type forms a small patch on the Northern side of the Valley, bordering Meghalaya. The texture of this type of soil is sandy loam, rich in iron (Fe) and aluminum (Al) content and high in acidity.
e) Peat soil: This soil occurs in scattered patches of low lying areas i.e. in beels and haors. The soil is rich in organic matter, usually dark grey in colour and heavy in texture.

**Description of the study area**

Rosekandy Tea Estate is situated in the Barak valley which is surrounded by N. C. hills and Jaintia hills in the North, in the east by the state of Manipur, in the south by Mizoram and in the west by the state of Tripura and Sylhet district of Bangladesh. The area has an altitude of 26- 30 m above major sea level and falls under 24°8’N latitude and 29°15’ E longitude. Rosekandy Tea Estate was established in 1860 by Mr Sunderman. Total grant area of this estate is 1702.01 hectare and area under tea is 574.70 hectare. The estate is located at a distance about 28 km from Silchar town. It is surrounded by about 8 to 10 revenue villages, cultivated fields and Chutla Bheels on all sides.

**Geology:**
Geologically the area is entirely alluvial in origin and is composed of pebbles, sand and clay containing decomposed organic matter formation of laterite stones and stony profile at places also a common feature. The rocks in this area are predominantly sand and clay shades (Dutta et al., 1999).

**Climate:**
Rainfall: It is seen that average of 95 mm rainfall is received by the area during the month of December- February. During the pre- monsoon period from March- May, it receives 756 mm of rainfall. In the south- west monsoon season it receives 1856 mm rainfall while returning south west monsoon, in the months of October and November, its rainfall is 238mm.

Temperature: The temperature regime of the area with a mean maximum temperature of 30.2°C accompanied by a fairly relative humidity reveals that the area experiences humid subtropical climate.
Topography and soil condition:
Despite the high intensity of rainfall the area suffers from drought during the dry season due to its undulated topography and comparatively higher elevation.

Vegetation:

Vegetation in the tea growing areas shows the presence of various shade trees i.e. permanent shades like Albizia lebbeck, Albizia chinensis, Albizia odoratissima, Derris robusta and temporary shades like Indigofera teysmanni, Melia azadarach sp along with weed species like Boreria sp, Leucas sp, Clerodendron sp, Eupatorium sp, Melastoma sp, Mikania micrantha etc.

The surrounding vegetation reveals the characteristic of secondary successional vegetation with some paddy fields scattered around. The vegetation mainly includes Colocasia sp, Ageratum conyzoides, Ipomea carnea, Artocarpus heterophyllous, Mangifera indica and fern species. The other tree species observed are Acacia lenticularis, Leucaena leucocephala, Albizia procera, Acacia auriculiformis, Acacia leuticularis, Acacia leucocephala, Cassia siamea, Gmelina arborea etc.