CHAPTER - III

AREA, TOPOGRAPHY AND CLIMATE
3. AREA, TOPOGRAPHY AND CLIMATE

3.1 Area

Guwahati, a fast growing premier city with an area of 264 sq.km is known as the gateway to the NorthEastern region of India. It is the principal centre of socio-cultural, industrial, trade and commerce of the entire region; Dispur, the capital of Assam is a part of greater Guwahati situated at the southern bank of the mighty Brahmaputra river in Kamrup district of Assam. The location of Guwahati is entirely picturesque. While in the north rolls the mighty river Brahmaputra, the south and the eastern sides are surrounded by two rows of semi-circular wooded hillocks. The cardinal points of Guwahati are 26° 10' north latitude and 92° 49′ east longitude (Fig. 3.1 & 3.2).

3.2 Topography

Guwahati exhibits a peculiar physiographic basis. Alluvial plains are surrounded by hills and hillocks believed to be the partial extension of Gondwana landmass of pre-Cambrian origin. A careful analysis of the topography reveals that the greater Guwahati master-plan area can be divided into six well-defined natural divisions. The old city lies in a horse-shoe shaped valley surrounded on the north by the Brahmaputra river and on the other three sides by low hills comprising Kharghuli and Chunchali hills in the east (maximum height 216m), Japarigog (277m), Nakarashura hill (293m) and Fatasil hills (292m) on the south and the famous Kamakhya (Nilachal hill) on the west (Maximum height 303m). The average elevation of this valley is about 52 msl, though there are many higher as well as lower pockets within this area.

Bounded by these hilly ranges on the north, Khasi & Jaintia hill ranges on the south and east and the Fatasil hill on the west lies the broad plain which can be termed
Fig. 3.1 Map of Assam showing Greater Guwahati
Fig. 3.2 Map of Greater Guwahati Showing Experimental Sites
as Beltola plain. This Beltola plain extends from N.E to S.W with an average width of about 4 kms. Further to the west of the city lies the Jalukbari-Azara plain where the Deepar beel and its adjoining low-lying areas are located. The North Guwahati - Amingoan area on the north of the river Brahmaputra is situated on a flat plain interrupted by some small rolling hillocks which has made the river bank stable. The Agyathuri hill, situated on the western boundary of this plain rises to a height of about 300m. There are also many low-lying areas and beels in this region.

The Basistha, Bharalu, Khanajan and Bondajan are the four major streams which pass through the city. To the southwest of the city area, there lies the Deepar Beel, a large natural wetland, rich in bio-diversity. Other wetlands within the city are Chola Beel and Silsako Beel and Tepar Beel. (Fig. 3.2).

The natural vegetation is scanty within the city and is represented by brushes and low- growing deciduous and semi-evergreen plants. Plantation of deciduous plants is occasionally found on the roadside and hill slopes. Total population of the greater Guwahati is about 809895 (according to 2001 census).

3.3 Geology, rock and soil

Guwahati is situated on the fringe of hard rock formations. There are distinctly two geological formations. The alluvial plains of the Brahmaputra are interrupted by inselbergs formed by gneisses and schists, which were originally part of the Shillong Plateau. The principal rocks of this outlying portion are acid and basic gneisses, intruded by granite, pegmatite and quartz-veins. The alluvial tract of the Brahmaputra valley, which covers a major portion of the division, composes mainly of silt, sand and clay with occasional pebble-beds. The alluvial plains also include the marshy tract, which comprises the Deepar beel area. Occurrence of iron-ore, quartz and felspar deposits are reported from the outlying hilly portion of the area. Due to the effect of weathering of the rock and erosion, the soil in the crests and ridges of the hills are coarse & gritty and
lacks in depth, with entrapped pockets of good loam in between boulders. The middle and lower slopes including the foot-hills are composed of a deep tropical red-loam, except for places subjected to heavy erosion. The texture of the soil of greater Guwahati are rocky clay, loamy, rocky soil and sandy loam.

3.4 Climate

The state of Assam is situated in the North Eastern region of India (Fig. 3.1) which falls within the southeast Asiatic monsoon land. Climate of an area considerably affects human activities and in turn city life and its functioning. Although the climate of greater Guwahati is almost similar with the Brahmaputra valley, yet some variations are noticed due to physical features. Its principal characteristics are slightly cold and foggy winter, a moderately cool spring and a fairly hot and humid summer and pleasant autumn.

The city experiences a tropical to subtropical warm humid climate characterized by the peak summer temperature rising upto 38°C, while in winter, sometimes it falls to 10°C.

Climatically the whole year can be divided into four seasons. From March to May (spring), the weather is dry with less humidity and the heat is not oppressive. In the month of March, the northeast wind carries the dry sand from the river Brahmaputra and makes the whole atmosphere dusty. In April and May, rain along with thunderstorms are a common feature. The mean minimum and maximum temperatures vary between 12°C to 31°C during this period. From June to August (summer), there is sufficient rainfall (Fig. 3.3) but the heat is oppressive till about August due to excessive humidity. The mean minimum and maximum temperatures vary between 25.5°C to 33.3°C. From September to November (autumn), the weather is pleasant with less rainfall and fog. The mean minimum and maximum temperature vary between 21°C to 31°C. Real winter steps in December and lasts upto February. Except few occasional showers there is practically no rain. The mean minimum and maximum temperatures vary from 10°C - 24°C (Fig. 3.4) and mist occurs during the night and the morning.
Fig. 3.3 Monthly Average Rainfall (mm) of Greater Guwahati Recorded During 2000 - 2002

Source: Regional Meteorological Centre
LGBI Airport Guwahati - 781015

Fig. 3.4 Monthly Average Maximum and Minimum Temperature (°C) of Greater Guwahati Recorded during 2000-2002

Source: Regional Meteorological Centre
LGBI Airport Guwahati - 781015
Fig. 3.5 Monthly Average of Relative Humidity (%) of Greater Guwahati during 2000-2002

Fig. 3.6 Monthly Average of Sunshine Hours in Greater Guwahati during 2000-2002
The average annual rainfall at Guwahati is 1746.5mm (as worked out). About 90% of this rain occurs between April to September, the maximum rainy months being May, June, July and August. The prevailing wind direction in Guwahati is from North-East to South-West during the winter months while during the summer it is from South-West to North-East.

3.5 Relative humidity

The maximum relative humidity found 89% in the month of December and January at the 08.30 hrs. And highest 83.1% in the month of September at 17.30 hrs. (Fig. 3.5).

3.6 Bright Sunshine Hour

The average bright sunshine hour per day as recorded in Regional Meteorological Center, Guwahati, of greater Guwahati was highest (240.3) in the month of December and lowest (73.9) in the month of July during the year 2000 to 2002 (Fig. 3.6).