

CHAPTER 2

PHYSICAL PARAMETERS OF THE STUDY AREA

2.1 GEOMORPHOLOGY

2.2 RELIEF

2.3 SLOPE AND SLOPE ASPECTS

2.4 CLIMATE

2.5 SOIL

2.1 Geomorphology

The study area, Koch Bihar District is a part of Gangetic plain and formed by the depositional work of seven major river systems viz, the Sankosh, the Raidak I, the Raidak II, the Torsa, the Kaljani, the Jaldhaka-Mansai, and the Tista. These rivers are flowing through the District from north-west to south-east. These rivers have originated in the Himalayas and have deposited a thick layer of alluvium throughout the length and breadth of this District. Therefore, it is an aggradational plain. Extreme horizontality of this monotonous plain is its main characteristic, whereas its average elevation is about 60m above mean sea level. The District has its own geomorphological varieties which have its own significance. The innumerable tributaries of the main seven rivers of the District coming from the north i.e. from the southern slope of the Himalayas have meandering course and there are a good number of bills and ox-bow-lakes. Physiographically there is a little diversity in relief and surface configuration of the District. There are vestiges of abandoned channels, some of which get dry during the dry season. The wet channels are called *Jhills* or *Bills* create water logging and their marginal lands are used for grazing. There is fresh water in these *Jhills* which are used for fishing serve as the permanent occupation of the lower caste people (Plate 2.1). The main river channels shift often and leaving the original courses behind. Fluctuation in river course is another devastating hazard for the flood plain dwellers. The relief and geomorphological features control the magnitude as well as the frequency of flood.



Plate 2.1 *Jhills*, the main source of fish availability in the study area.

2.2 Relief

Basically, the study area is a plain area. It is a part of Brahmaputra river basin. The general elevation of the area is varies from 30m to 80m above the mean sea level. There are no areas under mountains and plateaus. It is fully a plain area (Fig. 2.2). There are many low lands where flood water stays for long period. It is a flat country with a slight south-eastern slope. The main rivers of the District flow in this direction (Fig. 3.8). There are slight up and down in the District. Most of the highlands situated in Sitalkuchi and Sitai Blocks and most of the lowlands of the District lie in Dinhata I Block. There are large numbers of marshy land in the District.

2.3. Slope and slope aspect

The District has an almost flat terrain with a slope between 0-1 percent. The general slope of the area is from north-west to south-east. The north-eastern part of the District has a slope of 1-3 percent. One small upland area is in the Lalbazar Pargana in Sitalkuchi Block where the slope is above 3 percent. There are slight up and downs while some areas are so low as to be inundated by the rivers during the monsoon, others are slightly higher and always above water level even when the rivers are in spate.

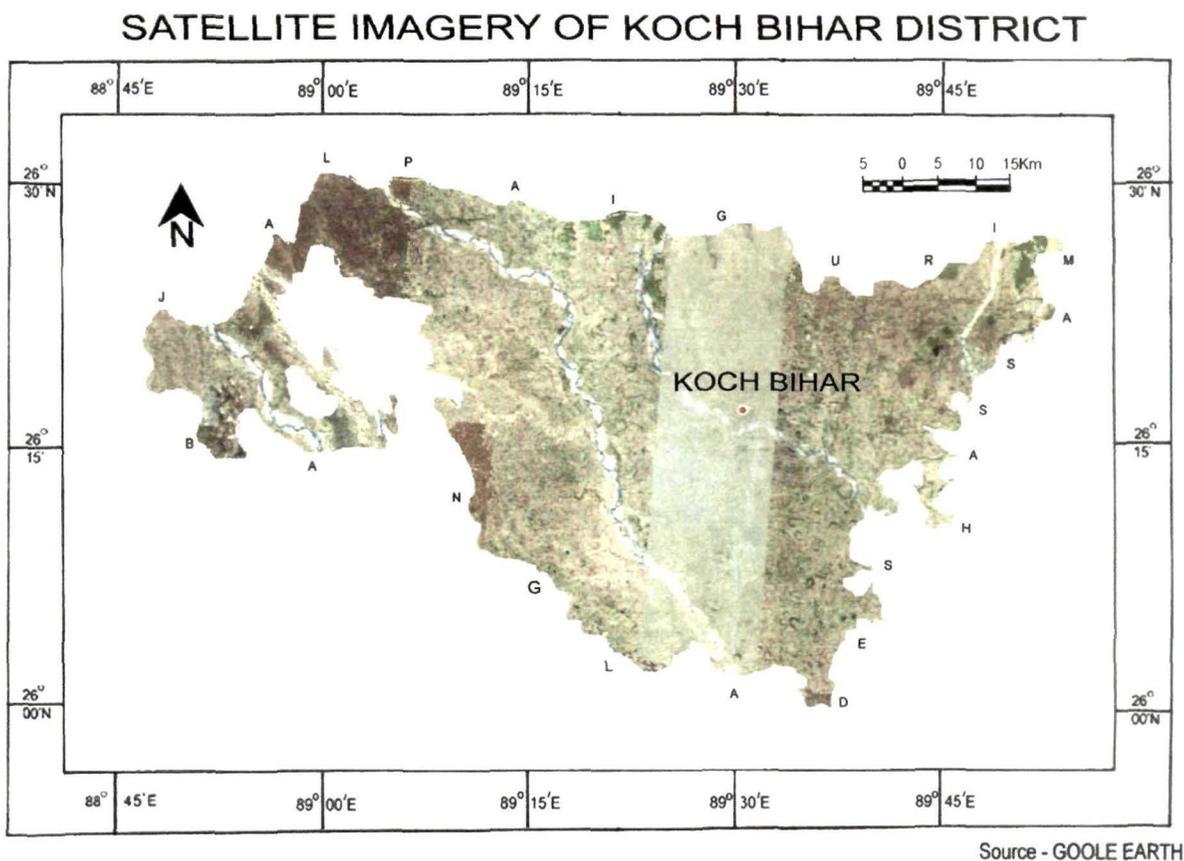


Fig. 2.1 A Satellite view of the study area.

2.4. Climate

The District Koch Bihar is fully lying in the tropical region. Here tropical monsoon climate is found. Rainfalls occur due to south-west monsoon during summer period. Annual average rainfall is 346.58 cm. Rainfall concentrate mainly during the south-west monsoon. Winter is dry as north-east monsoon cannot bring rainfall. Climate is characterized by highly humid atmosphere and being seldom excessive humidity. The period from June to beginning of October is south-west monsoon season. Winter being November to February and summer being March to May.

CONTOUR MAP OF KOCH BIHAR

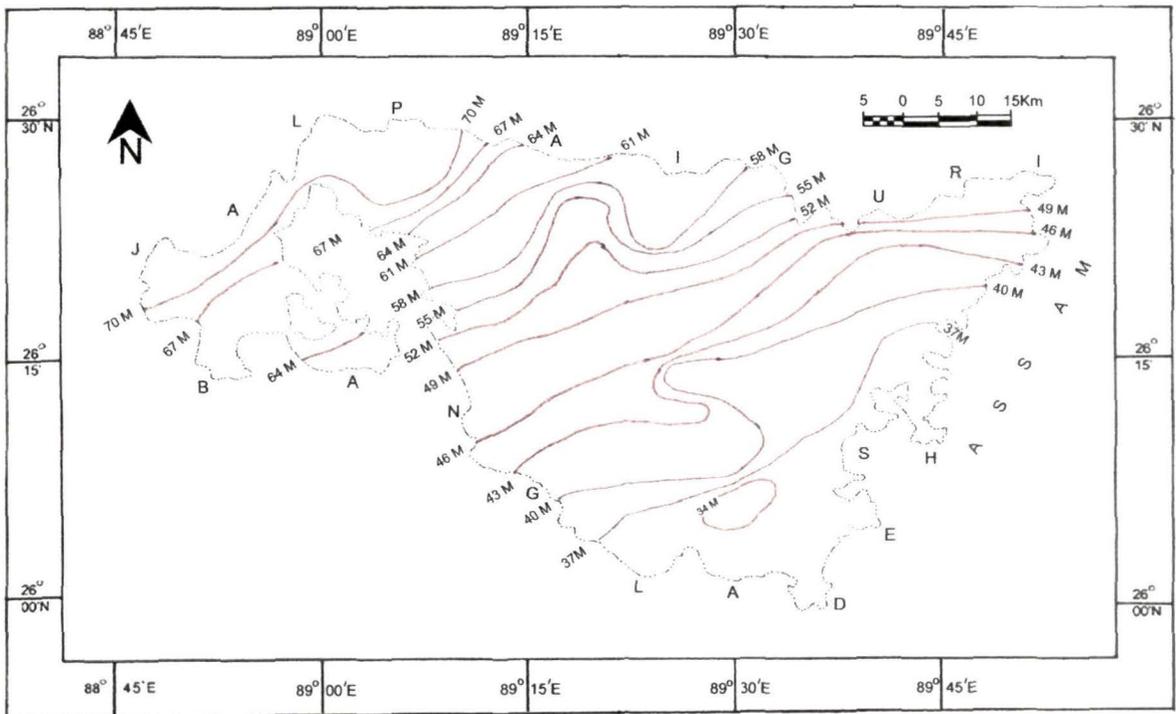


Fig. 2.2 Map showing major contour plan of Koch Bihar.

January is the coldest month with temperature varying between 10.4°C to 24.1°C. April is the hottest month with mean daily maximum temperature of 32.5°C and mean daily minimum temperature of 20.2°C.

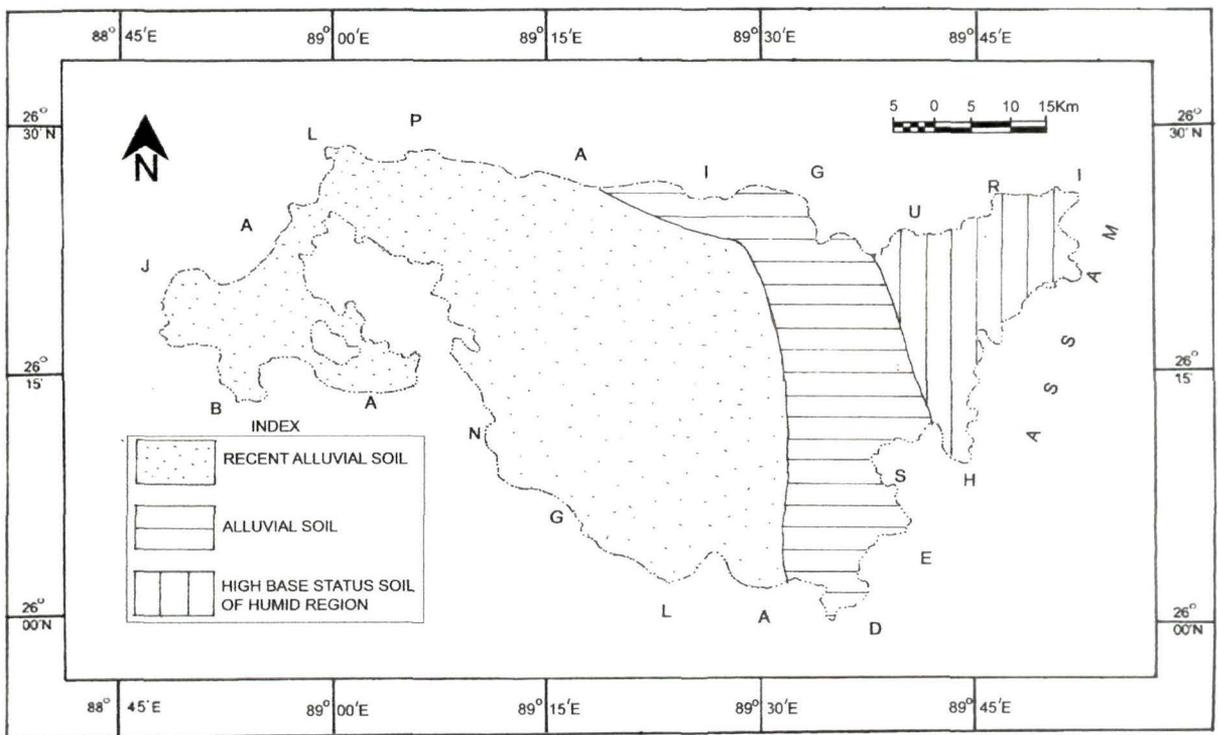
Rainfall generally increases from south-west to north-east. About 90% of the rainfall is received during the south-west monsoon. June is the rainiest month. On an average there are about 102 rainy days in a year with records of more than 400 cm rainfall in 24 hours. Mekhliganj Subdivision is the driest part in the District and receives about 260 cm rainfall yearly. Tufanganj Subdivision is the wettest Subdivision in the District and receives about 450 cm rainfall annually.

The atmosphere is highly humid throughout the year. During the months of February to May relative humidity are less, being only between 50% and 70%. During the period of October to April, the sky is generally clear or slightly clouded. In May, cloudiness increases.



Plate 2.2 Detritus materials carried by Jaldhaka-Mansai River during monsoon flow at Chhat Khaterbari.

SOIL MAP OF KOCH BIHAR



Source - District Hand Book of Koch Bihar

Fig. 2.3 Map showing major soil types of Koch Bihar District.

2.5 Soil

Soil of the study area is alluvial in nature. Most of the areas of the District are covered with fertile alluvial soil. But in many tracts of the District especially where the bank erosion is dominant; sandy soil is found. The soil of the District is alluvial of recent formation and has an admixture of sand which is known as sandy loam. The properties of sand, silt and clay however varies from place to place. The soil is of light texture and can retain moisture. The surface soil is sandy. The depth of soil in the District varies from 1000 m – 1500 m and forms with sand and alluvial which has been carried by the rivers from Himalaya. Below of this soil there are foundation materials like granite and metamorphic rock are situated. Nature of soil is light and percentage of sand is high. So, it cannot store water sufficiently for the normal growth of most of the common species of plants. pH value of the soil varies from 4.5 – 6.5. There are mainly five types of soils found in the District, namely:

- 1) Silty-loam soil,
- 2) Sandy-loam soil,
- 3) Sandy soil,
- 4) Newer alluvium soil, and
- 5) Older alluvium soil.

The soils are generally acidic in nature, because of heavy rainfall and greater gradient. Soils are highly leached. Sheet erosion is a problem in the areas of tea plantation in the District. Silty-loam and sandy-loam soil is found in the northern portion of the District. Sandy soil is found all over the District especially after flood. Older alluvium soil is found far away from river courses. Newer alluvium soil is found near the river. Every year this newer alluvium is deposited over the low lying areas (Fig. 2.3). This soil is ideal for the cultivation of paddy, jute, tobacco, mustered oil seed, etc. The turbulent water of different rivers carries huge amount of detritus material, which have an adverse effects on crop production as well as on the hydrology of the study area (Plate 2.2). Depth of alluvial soil varies from 15 cm to 50 cm which is superimposed on a bed of sand. The soil has a low level of nitrogen with moderate levels of potassium and phosphorus and deficiencies of zinc, calcium and magnesium. The soil has high level of sulphur.