CLASSIFICATION OF SOILS: A CASE STUDY OF MUNGER DISTRICT

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ABSTRACT

Soil is the backbone of economy development, because agricultural development depends on it. The availability of minerals, production of crops, construction of roads, railways and the site for settlement is the result of soil. North Munger is covered by alluvial soils while in south older alluvium or Bhangar mixed with forest soil is found with coarse texture. In rugged terrain of south Munger the pH value is about 3.5 only. In the district of Munger newer and older alluvium including the coarse texture sandy soils are found in the plain land whereas forest soil is prevalent with proficiency of literate in Kharagpur hills.

Keywords : Soil, Agriculture, Crops, Forest, Land etc.

Introduction

Munger is one of the ancient and important districts of Bihar. It is situated in south Ganga plain, historically and geographically known as the Anga plain. Munger is located just on the levee of mighty river Ganga which makes it flood-prone each year. Its eastern boundary touches Bhagalpur districts and formerly the district was a part of Bhagalpur. Its western boundary touches Lakhisarai district and prior to its bifurcation, Lakhisarai was also a part of Munger district. Its northern boundary is demarcated by the river Ganga and formerly parts of Khagaria district also were included. The southern boundary touches the district of Jamui which was also its part earlier. The slope of the district is from west to east and south to north. Kharagpur Hills is situated in the middle part.

There are so many historical sites in Munger. Munger is famous for Cigarette factory, Gun factory and Rail coach factory in Jamalpur. It was the capital of Mirkasim, the Muslim Nawab. Chandrikasthan is a famous religious place, International yoga centre is also very well known all over the world. Munge-Jamalpur is almost aligned making it a twin city.

The district of Munger has roughly a shape akin to the shape of India. It is such a geographical region where the plain, plateau and mountainous area are found. It expands over an area of 1397.60 sq kms (139,759 hec) with a total population of 1367765 (2011). It is flanked between 24^0 56′ N to 25^0 30′ N Latitudes and 86^0 16′ E 86^0 44′ E Longitudes. There are 9 C.D. blocks in the district, namely Munger Sadar, Jamalpur, Bariyarpur, Dharhara, Kharagpur, Tarapur, Sansrampur, Tetia Bambar and Asarganj. The largest anchal is Munger and the smallest anchal in Asarganj. The average population density in Munger is 964/sq km. The literacy rate in Munger is 70.46%.

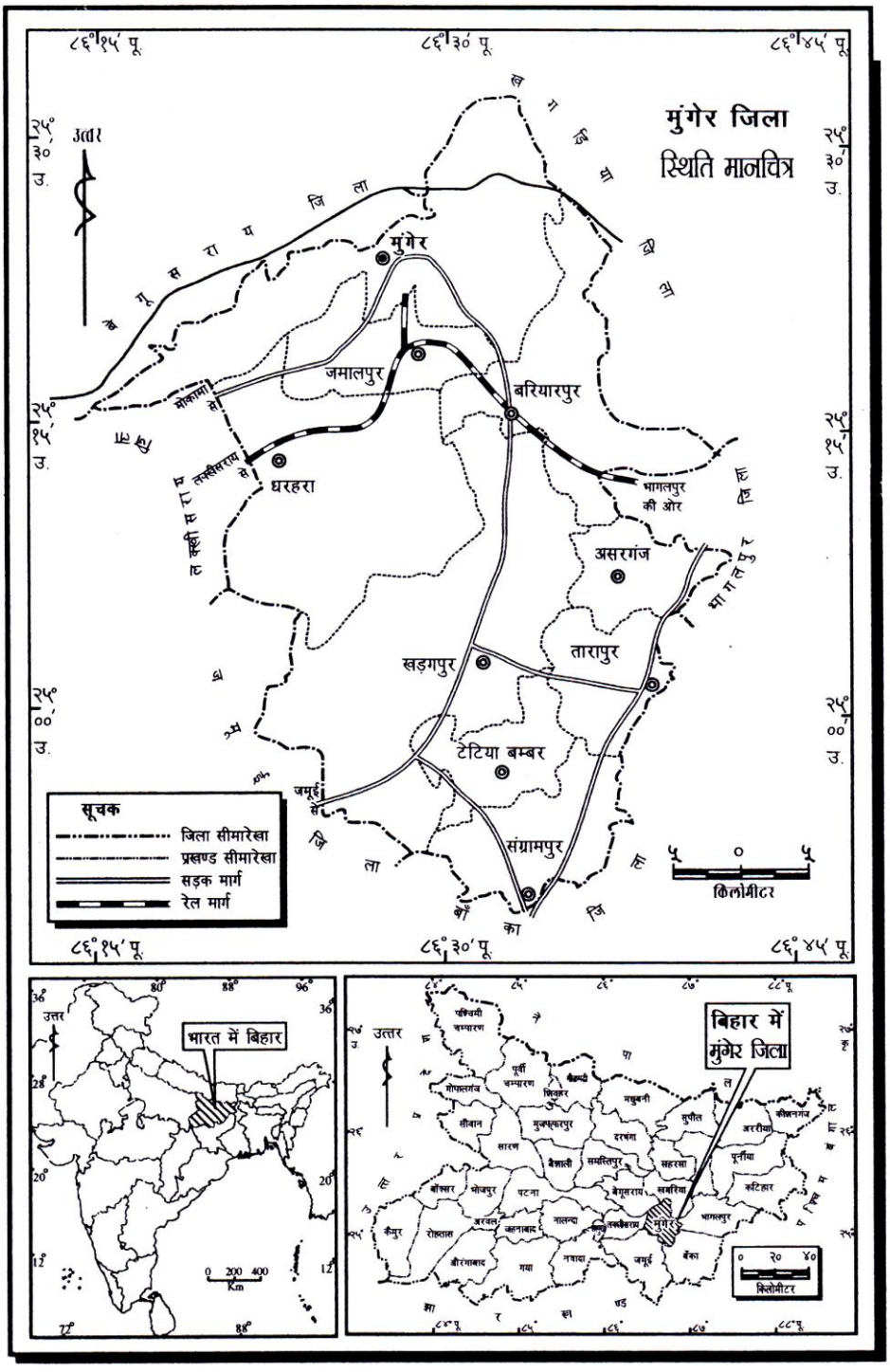

Fig. : 1.1

Soils Group

These types of rocks occur in the Kharagpur, Jamalpur and Dharhara anchals where the plateau region begins. The soils are very shallow, stony, gravelly and deserve to be put under forest to check further defer oration due to erosion.

This soil is found on the banks of river Ganga, Maize, Sugarcane, Arhar, Wheat and other Rabi crops are grown successfully. The soils are generally light texture whitish to light grey in colour and slightly to moderately alkaline in reaction with medium to high fertility status.

Classification of Soils

Soils of the study area may be broadly put under two from their genesis point of view, (a) Alluvium and (b) sedentary. Alluvial soils have developed on the alluvium brought down by the river Ganga and its numerous right and left bank tributaries. This soil may again be sub divided into two categories recent and old alluvium. But the study area is mainly concerned with recent alluvium soil only.

Recent Alluvium Soil

These soils are found north of the Ganga river co-extensive in area comprising Bariarpur, Kalyanpur, Surajgaraha of Munger District. Generally soils are of light texture near the river courses and away from them are relatively heavy. They are characterized by well drained or moderately well drained light yellowish brown, single grained silty and sandy surface soil. The pH of the soil varies neutral to strongly alkaline. The soil usually exhibits multiple horizons with alternative layers of silt and sand. Each layer is clearly differentiated from the other in colour, texture, *etc*. Bhadai crops are grown on them profitably. With the help of irrigation, these soils may become more suitable for growing a great variety of crops

Diara lands occurs within the two banks of river The Ganga like the islands format between the dhars mara (dead) or active alive. In the process of silting and sowing these soil have developed in between the natural levees that usually get inundated mainly during June – October and are periodically subjected to erosion meandering, braiding and shifting of courses. Soils are generally course textured and surface texture changes with the distance from river bank where they develop into heavy texture. Close to the banks the soils are predominantly light textured owing to an admixture of silt and sand. They are alkaline in reaction (pH 7.6 to 8.6), pale alive (S5Y 6/3) to white (D5y 8/2) in colour with higher value (6-8) and lower chrome (1-4), low in organic carbon content (0,04-0.52 percent). The uneven distribution of mechanical separates shows the stratification depending upon the mode of deposition of soil particles. This is an indication that soil is of recent origin. Soils are of low to high fertility level depending upon the sediments carried and deposited by currents of river/streams. (Singh, S. and kaith P.S-1947).

The important Diara of the Ganga is Hero area. Usually Diara lands are almost monocropped and in great majority of the cases the crops are raised only in the Rabi season due to inundation of the tract with flood waters for nearly 3 to 4 months *i.e.* from July to October. If rains do not occur in the Diara strips early, the Bhadai crop of Maize may be grown advantageously even on low lands. The Diara suffer from hot and dry summer leading to moisture strees, poor water retention capacity of the light textured soils, highly permeable sandy soils near the bank and in also those areas which are still in formative phases and where erosion and deposition are the usual phenomena.

Old Alluvial Soil

These soils are usually formed in the southern bank of the river Ganga in an elongated form generally known as Tal land. They comprise nearly flat lands away from the source Rivers, and get flooded once or twice in a year. The sediments deposited are of fine materials. The soils are medium to heavy textured and grey to greyish-yellow in colour. The fertility status is fairly good. In reaction these soils are neutral to slightly alkaline. Such soils are a fine example of centenary soils. The soils are mostly drained to moderately well drained. (Jha, P.P. 1997). Soils of these area differ from Diara land but has nexus with the economy of that area because these soli are mostly suited to paddy grown in medium upland to low land. These paddy fields either remain fallow during the Rabi season or grow paira (catch) crops of Khesari, Gram and linseed during the Rabi harvest. The moisture range in which physical condition of such soil is fairly suitable for tillage and sowing operation is quite narrow. These soils have impeded drainage and poor water relations. In these soils, only Rabi and occasionally Bhadai crops are grown.

The Ganga Diara soils are genetic alluvial devoid of distinct horizons. Such soils show definite layering. The topsoils vary from pure sand to clay loam and are invariably underlain by sand layers at varying depths. Usually, texture is coarse and light at the proximity of the rivers and become heavier as the distance from the river beds increases. Since Diara soils are light texture with preponderance of sand and silt, their nutritional capacity, particularly of phosphorous, is limited. However, these soils are fairly productive if nutrients are supplemented.

Soil Association

Soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil and is named after the major soil group. The soil in one association may occur in another, but may reveal a different pattern. The soils in one association may be more or less the same or may be different but the pattern in which they occur is fairly uniform (Jha, K.K.2011).

The FMIS is planned in four stages: Flood hazard characterization & Emergency response; improved flood preparedness and community participation, flood hazard mitigation and Integrated flood management. The technical improvements in flood forecasting, inundation modelling and warning and embankment management are also coupled with expanded institutional and community linkages and expanding geographic

coverage (from the most flood –prone 11 districts in north Bihar in the first stage to the whole flood prone area in the third stage). The fourth stage aims to develop integrated Flood/drainage/ irrigation management through upgrading FMIS into a Water Resources Information System, implementing operational community base flood management and operationalizing regional flood knowledge base and management plans. The first module has been implemented and operational during 2007 flood season, with focus on flood hazard characterization and operational flood management information products, supplemented by improved flood forecast, a flood website for public disseminating and access, updated flood control manuals, plans for upgrading hydrologic measurements and telemetry training. Providing and disseminating information tools have moved sector agencies capacity from disaster response to improved disaster preparedness and to effectively support flood fold control management in the flood prone areas in the state of Bihar. The FMIS in the first stage had covered the focus area from Burhi Gandak river in the west and Kosi river in the east in North Bihar that is most flood prone in the state. The subsequent stages of FMIS development would cover substantially enhanced functions and products, supported by improved hydrologic observations and telemetry, more reliable and longer term rainfall forecasts, enhanced flood forecast and inundation prediction with better models, airborne Synthetic Aperture Radar (ASAR) surveys for real – time inundation information during floods, close- contour surveys of the flood plain, mapping flood plain geomorphology including micro- relief to understand and improve drainage, improved communication links and information flow, risk and vulnerability analysis, institutional and community outreach mechanisms and real time flood data dissemination. The filly upgraded FMIS would support preparation of master plan for flood control and drainage, irrigation improvement and overall water sector development in Bihar State.

Conclusion :

The geographical area in South Bihar is approximately 41235 sq. km. comprising 17 districts namely Rohtas, Buxar, Kaimur, Bhojpur, Arwal, Patna, Jahanabad, Aurangabad, Gaya, Nalanda, Sheikhpura, Nawada, Lakhisarai, Munger Jamui, Bhagalpur and Banka. Some major rivers lying within this region are Sone, Punpun, Kiul *etc*. Besides, there are many small rivers in this region also. However out of 17 only 3 districts *viz* Patna, Munger and Bhagalpur are covered under the FMIS Focus Area. The soil of the area is sandy alluvial, rich in lime and often contains high proportion of clay. There are pockets where soils are calcareous with high proportion of calcium carbonate. The soils are among the most fertile in Bihar and can support a variety of crops with appropriate land and water management.

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