GEOLOGY AND SOIL
Lakhimpur district (undivided) is an intrinsic part of Brahmaputra valley, its northern territory is bounded by the great Himalayan ranges contain the cretaceous-tertiary sediments. The scattered hill slopes are made up of Inselburgs of gneissic. The Archean gneissic formation are composed of gneisses and schists. Main components of gneisses are quartz, feldsper and small amount of mica and magnetite. There is presence of coarse and fine grain granitoid gneisses in the ridges of Subansiri, Ranga, Goghara rivers. The area is made up of Tertiary sand stones (Siwalik group) associated with clay. Sand stones are of medium grained, often compact and generally soft and at places well bedded and grey, buff and whitish in colour.

The valley region i.e. the southern part of the district is supposed to be the part of Indo-Gangetic-Brahmaputra river system and consists of Pleistocene and recent deposition of the sediments derived from Himalayan ranges. Pleistocenous depositions occurs along the north of Brahmaputra with older Alluvium or "High Level Alluvium" where there is scattered hill spurs. But newer Alluvium deposition is extensive and diversified along the foot hills of Arunachal Pradesh and in Jonai and Dhemaji subdivision and partly of Lakhimpur subdivision
particularly along Dirgha river the soil is unassarted in nature containing boulders, pebbles, sand and silt with water-seepage.

It is observed that the deposits brought down by the river Brahmaputra is quite different from that of the tributaries of Subansiri, Ranga, Dirgha flowing down through the foot hills with different types of alluvia.

SOIL:

There are 4 different types of soils found in the district. These are Entisols, Inseptisols, Alfasols and Ultisols based on the classification made by soil survey staff of United States, Department of Agriculture and Indian works particularly of Chakravarty (1977). Chakravarty et al (1978, 1979, 1980) and Karmkar (1985).

(1) Recent riverine alluvial soils are the Entisols, often found in the flood prone areas brought down by the river Brahmaputra with Sandy loam to silty in texture and light to dark grey in colour of the upper horizons where as the lower horizons are usually with sandy or loamy-sandy.

(2) Old riverine alluvial soils are the Inceptisols usually deposited by the river systems of the district and not subjected to the flood hazards. Upper horizons with sandy loam to loam, silty clay-loam, silty clay and clay and mostly light greyish brown to light brown in colour.
(3) The mountain valley alluvial soils are the Alfasols which were formed of alluvia washed down from the hill slopes by the tributaries of Brahmaputra and of Subansiri. Soils are usually medium to heavy textured loamy to clayey in nature with less permeability.

(4) Along the hilly regions bordering Arunachal Pradesh and scattered hill spurs, coarse textured soils reddish in colour due to presence of iron-oxides derived from granites and schists are the Ultisols.

Strongly acidic soils are with pH 4.5 to 5.0 often met with the hilly and foot hill regions, where as flood prone areas with almost neutral soils, the pH value of which is found to be in the order to 6.0-7.0.

The high rainfall results in increasing the content of organic matter and the broad leaved plants forming humus covering upper horizon in the moist evergreen rain forests of Ranga, Kakoi, Gali, Dulong, Paba and the soil is found to be black.

In the perennial waterlogged bodies - the 'beels' and swamps where soils are rich in peat depositions and consists of silt and clay -often termed as "histosols".

In "Char" areas particularly of Goghra river and Ghasasuti-branch of Subansiri of North Lakhimpur subdivision, the soils composed of silts and sands. The
areas annually inundated and found to be of recent origin, their finer silt layers usually left behind. pH of these types of soils varies from 7.5 to 8.2.