1.1. GENERAL STATEMENT:

Man and his environment are closely inter-related. The rapid rise of human population and extensive industrialisation have put heavy demand on the depleting natural resources. Out of these, soil is a very important natural resource. The agricultural production depends mainly on the quality of soil. About 37.6 percent of the working population of India is dependent on agriculture, and the cultivable land area is only about 46.9 percent. The remaining 16.79 percent non-agricultural area is the waste-land. It is estimated that about 167 million hectares area has undergone degradation and another 20 million hectares, which is under canal irrigation, is in danger of being degraded (Bali and Kanwar, 1977). A broad distribution pattern of the saline-alkali soil areas of India is shown in Fig. 1. In Uttar Pradesh where agriculture is the chief resource, about 1.29 million hectare area of Indo-Gangetic alluvial plain is effected by various degrees of salinity and alkalinity along a linear belt (Abrol and Bhumbla, 1971). The study area of Sultanpur district forms part of this soil belt of U.P. (see Fig. 1).
Fig. 1
1.2. SCOPE OF PRESENT WORK:

The study comprises type, nature, extent and physico-chemical characteristics of the saline-alkaline soils of Sultanpur area, U.P., aided by remote sensing methods. The satellite remote sensing is an important tool in soil mapping and monitoring of land degradation. The LANDSAT (TM FCC) and IRS data have been used along with selective ground checks in preparing maps of saline-alkali soils. The soil samples were analysed in the laboratory for their chemical, physical and mineralogical properties with a view to understand distribution, redistribution and fixation of soluble salts, metals, colloids, etc., within the soil profile, their topo-geochemistry vis-a-vis climate and hydrogeology and their genesis.

1.2. GEOGRAPHICAL SET-UP:

1.2.1. Location:

The study area lies between longitude 81° 32' E to 82° 41' E and latitude 25° 59' N to 26° 40' N. It includes Sultanpur district of eastern U.P. (Fig. 2), covering an area of about 4436 sq. km. It is a predominantly rural area.

1.2.2. Communication:

The area is well connected with Lucknow, Faizabad, Pratapgarh, Allahabad, Jaunpur and Varansi by rail and road.
1.2.3. Climate:

The climate of the region is tropical. The seasonal fluctuations of temperature and rainfall are due to reversal of wind direction. During November to May the winds blows from the west to east and during June to October from the east to west.

i) Temperature:

The minimum temperature is recorded at 3°C to 4°C during the months of winter (December-January) and maximum temperature at 44°C to 45°C during the months of summer (May-June).

ii) Pressure and Winds:

The atmospheric pressure during June to August is around 985 millibars which rises to 1004 millibars when the temperature is very low. A shallow cell of high pressure with seaward gradient develops during the winter months which is reversed landward during the summer.

iii) Moisture and Humidity:

The winds are dry during the months of March to May and humid from June to September.
iv) Rainfall:

Over 90 percent of the average annual rainfall is received from mid-June to mid-October. The rainfall is very scanty and sporadic from mid-October to mid-June. The average annual rainfall is 984.5 mm.

1.2.4. Cropping Pattern:

Crops are grown only in the unaffected soil regions of the area. Rice and wheat are the main crops while Barley, millet, maize, pulses, sugarcane and potato are also grown.