CHAPTER - III

GENERAL DESCRIPTION OF THE STUDY SITE

LOCATION :

Saugar occupies a central position in the country and lies at 23°50' N latitude and 78°40' E longitude, a few miles of north of tropic of cancer. It is on the northern boundary of the state and is situated over a hilly track of an average height of 517 meters above mean sea level.

TOPOGRAPHY, GEOLOGY AND SOIL :

The entire topography is very much undulating with low rising hills scattered all around. The maximum height is shown by southern hills (683 m) while minimum towards the north (350 m).

The main geological formation of Saugar and its suburbs is basalt but the Vindhyan sandstone also appears at a number of places. The basalt rocks are derived from the lava flow and Vindhyan sandstones are formed by sedimentary rocks. Usually a Daccan Traps show tendency to form square cut hills, more often having terrace like features. They mostly occupies the valleys, low-lying areas and plains throughout. These rocks appears to be comparatively more susceptible to physico-chemical weathering, and hence a number of places, laterites are formed.

The colour of these basalt rocks is in most cases grayish green to perfectly black, although a few lava flows have a lighter shade. The sandstone rocks are made up of fine textured quartzites. The quartzites are well cemented and compact, the individual quartz grains are coated with iron oxide at their periphery and the cementing material is either silica or silicates of iron and aluminium.

The thickness, colour and texture of the soil usually depends upon the vegetational cover and the topography of the forests stands. Undulating topography causes great variations in the physical and chemical properties of soil. Foot of hills characterized by black and clayey soil which shows water logging during rainy season. The silica, alkalies, organic matter and finer particles of these soils are washed down from plateau through slopes to get deposited in basins. Such soils are black fertile and vary in thickness. On the plateau and slopes the soils undergoes the process of laterization, resulting in the development of red colour. This is due to removal of silica and alkali metals and accumulated the hydrated oxides of iron and aluminium.

On the slopes the physical weathering of sandstone bring about the formation of taluses, leaving some sandy soils between the stone pieces, whereas basalt rock weathering chemically depends upon the availability of water, temperature

carbon dioxide, concentration of various organic acids formed after decay of plant residue. Bases of hills formed extensive plains with a thin mentle of soil. The soil derived from the basalt hills is slightly alkaline with more of organic matter, phosphorus, potassium and calcium. However, soils derived from sandstones is acedic with more of nitrogen.

CLIMATIC CONDITIONS :

On the basis of rainfall, humidity and temperature, the climate can broadly be termed as seasonal with three well marked seasons, viz., rainy, winter and summer.

Rainy Season :

The rainy season starts from the second week of June and continues upto the end of September. A greater part of rainfall is received during these months. This season is characterized by heavy rains and high relative humidity.

Winter Season :

Winter follows the rainy season and it extend from mid-October to end of February. It is well marked by low temperature and moderate relative humidity.

Summer Season :

This is a dry and hot season, and starts from March and end up to the June. It is characterized by high tem-

perature and extremely low relative humidity.

Rainfall :

Rainfall of Saugar is seasonal and distributed throughout the year (Table 1 to 3). Total annual rainfall based on an average of last sixty years meteorological records, is 1234 mm (Joseph, 1977). Total annual rainfall during year 1980; recorded at the study site was 1056.9 mm (Table 4) with 78 rainy days. A period between June to September was observed to be of maximum rainfall during a year. The maximum rainfall was recorded in the month of August (378.4 mm) followed by July (347.5 mm) and June (266.6 mm). Few rains showers were also experienced in both winter and summer season.

Temperature :

The temperature exhibits a large range between winter and summer. The lowest temperature was occurred in the month of January, where the mean is 18.5°C, then a gradual rise in temperature was recorded in subsequent months, viz. (25.6°C in March, 31.9°C in April, 34.8°C in May). In June the mean temperature is 30.5°C which comes down i.e., 26.4°C in July and 25.5°C in August. September and October, undergo little warming again and temperature further rise to 26.9°C and 27.7°C respectively. The declines in temperature was observed from November to January. The mean temperature

was recorded in November, December and January was 27.7°C, 22.4°C and 18.5°C respectively. The highest temperature of study year was recorded on 28th May (43.5°C). The mean daily range of temperature fluctuations varied from month to month and from season to season (Table 4).

Relative Humidity :

Relative humidity has been considered as an important factor which governs the phenology of the plants, growth of micro-organisms and disappearance of dead organic materials. Relative humidity is highest in August, September ranging between 92-80 per cent but in the peak of summer i.e., April, May; the range is between 19 to 27 per cent. The minimum average relative humidity was recorded in the month of April (19 per cent). In June it was comparatively higher and may be due to occasional rainfall and cloudy weather. In winter it varies between 35-60 per cent. Monthly and annual climatic conditions are given in tables 1 to 4 respectively.

Ombrothermic Diagram :

The effectiveness of climatic factors like rainfall, monthly temperature and dry period can be understood in a better way by means of ombrothermic diagram (Gaussen, 1960), which is shown in Fig. 2. Thus, monthly value and regimes of rainfall and temperature are revealed at a glance. A

month is considered to be dry when its mean rainfall is less than twice its mean temperature.

The ombrothermic diagram for the study area (Fig. 2) clearly indicated five wet months (from June to October). In addition to rainy season (wet months) a short moist period during December is also indicated in the diagram.