CHAPTER: 4

GEOLOGY & SOILS
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Geology: The geology of the entire district consists of Deccan traps with intertrappen beds. The rock formation in the district is crystalline and partially sedimentary. An immense accumulation of volcanic rocks, principally basaltic lavas are known as Deccan Trap. The word trap is applied to the step-like aspect of the weathered hills of basalt, which is common in the district. In the decomposition, the basalts are singularly uniform. Augite basalt of specific gravity 2.68 is common. The colour of rock is grayish-green with lighter or deeper shades. The bulk of the rock is composed of fine, grained mixture of groundmass of field-spar or quite. Besides abundant plagioclase (labradorite or anorthite) prisms, some times large tubular crystals of clear glossy orthoclase (samakine or adularia) as phenocrys is in the ground amass are observed. Primary accessory mineral like labalite are few but secondary minerals like calcite and quartz are plenty.

Recently two scientists of Maharashtra Institute of Technology (MIT), Pune discovered large deposits of copper in the form of Malachite in dense forest area. Konkan area was so far the only known site for chromite deposits. Geologist Dr. Avnash Phadke is continuing his search for volcanic ash deposits in different forest areas. According to Prof. Somaya, the age of tephra (ash) deposit is about seven lakh years. Similar deposits are also found near Morgaon in Pune district.

Soils: The soil of the district is lighter in the west than in the east and belong broadly to three main classes, namely black, red and brown. The entire district is covered by basaltic flows, commonly referred to as Deccan Traps, of 2 types, viz. Pahoehoe and flows. The fresh basalts are dark-to-dark gray in colour and are intruded by dykes. Some hillocks have laterite capping the trap. The alluvium is deposited near the riverbanks at places. Pink and reddish soils are frequent
while the dark soils are common. Beautiful Zeolite is the only mineral present in the district besides Kankar and construction material using rocks. The Pataleshwara temple at Pune is a fine example of architecture in basaltic rocks. A few good forts like Singad, Purandhar and Rajgad are located on inaccessible peaks and steep cliffs. The major area of the district is occupied by black or red soils. The black cotton soils are heavy in texture and have high percentage of clay and are sticky in nature. The dark color of the trap is due to clay fraction and is responsible for their sticky nature. The black cotton soils are one of the oldest groups of soils since the Tertiary era. The temperature and rainfall where the black cotton soils occur support dry deciduous forests. They have 40 - 60 percent clay contents.

Padoley (1955) observed that a) the detritus (materials above 2 mm in diameter in soil) consists of disintegrated and weathered bits of parent rock, b) the hygroscopic moisture content varies from 5 - 7%, c) the pore space is 48 to 61% - the volume expansion ranges from 17 to 34% and d) dispersion co-efficient ranges from 5 to 12 in surface soils. There are few definite horizons, the lowest of which passes with easy gradation to the disintegrated lava, (Murram) of red to brown colour. The soils of the district are comprised of five categories 1) forest soil, 2) varkas soil, 3) rice soil, 4) khar soils and 5) laterite soils.

**Black soil:** Black soils are generally very fertile except in the uplands where it shows low fertility. Calcium, Magnesium carbonate and Iron are found in appreciable proportion with variable quantity of Potash, but these soils are poor in organic matter, nitrogen and phosphorus. Black soils if fed with sufficient water and nitrogen are capable of high productivity, particularly for crops like Chilies, groundnut, jowar, wheat and sugarcane, etc. The kharlands lead to mangrove soils, which are quite rich in salt content and calcium. Some times due to low rainfall, soil becomes un-productive. Soils are particularly suited for rabi crops because of its quality of retaining moisture for longer time; crumbling and
becoming hard due to sun, occurs at many places e.g. Khed, Shirur, Daund and Purandhar areas.

**Deep black soil:** Such types of soils are found along the course of Bhima River and are low lying. Brown or copper soils commonly known as Tambvat are found in transition tract of eastern part of Khed, Haveli tahsil, and western part of Purandhar, Shirur. It is suited for wheat, Jowar and Bajra, etc.

**Red & Gray soils:** Tambadi or Red soil is seen around western portion of the district. It is found over the hill slopes in Junnar, Ambegaon, and Purandhar. The soils are rough and require deep ploughing. Red soils are suited for bajra, kulthi, nakal, groundnut and chillies. Soil erosion is acute in these soils because of sloppy nature of lands, mostly unprotected by natural vegetation due to over grazing

**Laterite soils:** It has clay loam soil at the surface. It is good for vegetation cover and poor in plant nutrients and organic matters. The pH ranges from 5.5 - 6.5.

**Red & Gray soils:** This soil is found adjoining Raigad district as well as in western portion of Pune district.