CHAPTER - II

GEOLOGICAL STUDIES OF WATERSHED AREAS UNDER INVESTIGATION

The detailed geological survey and study of geo hydrological characters of the rocks occurring in the watersheds of the areas under investigation were carried out. Geological set up of each area was determined. Accordingly geological observations of the basalt flows and associated features like dykes and fractures were critically studied in order to ascertain their field and water bearing characters of the following watersheds selected from four districts.

1] Nashik District [Fig. No. 2]
   a) Nashera Watershed Area near Mokhada;
   b) Ashewadi Watershed Area near Nashik ;
   c) Area of Mahatma Phule Society near Ozar; and
   d) Area of Jai Yogeshwar Society near Ozar

2] Ahemadnagar District [Fig. No. 2]
   a) Panoli Watershed Area Near Parner;
   b) Hivre Korda Watershed Area Near Takli Dhokeswar; and
   c) Hivre Bazar Watershed Area Near Ahemadnagar

3] Aurangabad District [Fig. No. 2]
   Kachhe Ghati Watershed Area

4] Jalna District [Fig. No. 2]
   Kadwanchi Watershed Area

Description of the above-mentioned projects based on the methodology given in Chapter No.1 is given below serially.
GEOLOGICAL STUDIES OF THE WATERSHED AREAS
IN NASHIK DISTRICT

The geological studies of four watershed areas in Nashik District were carried out viz. Nashera (Lat. 19° 49’ N; Long. 73° 26’ E), Ashewadi (Lat. 20° 05’ N; Long. 73° 44’ E), Mahatma Phule Pani Watap Sanstha (Lat. 20° 05’ N; Long. 73° 50’ E) and Jai Yogeshwar Pani Watap Sanstha. (Lat. 20° 05’ N; Long. 73° 50’ E)

There is a wide variation in the amount of rainfall received in these areas of the district. Towards the western boundary of the district, the average rainfall is about 2400 mm. But towards the east rainfall gradually decreases, till at the eastern boundary it is only 600 mm.

The geological set up in all the four watershed areas is almost uniform. At the lower reaches in every watershed area a thick pile of thin and thick irregular Amygdaloidal Basalt flows are occurring and at the higher reaches, Compact Basalt flows are exposed.

The vertical geological features like Dykes and Fractures also occur. However, dykes and fractures are very common towards the western boundary of the district. Towards the eastern boundary, fractures were not noticed and dykes are few in number.
1. **WATERSHED AREA AT NASHERA VILLAGE**

Nashera watershed area lies on the border of Thane and Nasik District (Long. 73°26’ E; Lat. 19°49’ N and Toposheet No. 47 E/5) [Fig. No. 3]

**Approach to the site**

Nashera village is located towards the west of at a distance of about 90 km from Nasik City. [Fig No. 3] To approach the site, all-weather road has been constructed upto Deobandh (approximately 80 km from Nasik), but beyond Deobandh upto Nashera village a Water Bound Macadam road (W.B.M.) has been constructed. Therefore the site is approachable only in dry season.

**Nashera Village**

Nashera is a very small tribal village, situated on the bank of Tributary of Deobandh. Though, local name has not been given to this Tributary, for the sake of convenience of description, it is named as ‘Tributary of Deobandh’ Nashera village have population of about 600 huts. The huts are scattered in the area of 2 Sq. km. The economic condition of the people is very miserable due to frequent droughts and lack of employment opportunities. Recently, “**Sahyadri Adivasi Bahuvidh Seva Sangh**” Shahapur, Dist. Thane, a Non Government Organization (N.G.O.), has taken up this village for development.

**Tributary of Deobandh**

Deobandh Tributary originates from the hilly region towards the east of Nashera village at a distance of about 2.25 km from the village. [Fig No.4] From its source it flows in a narrow valley having a gradient of about 1:35. All along its course fresh bedrock of Amygdaloidal Basalt is exposed. Small waterfalls are also developed at some places in Deobandh Tributary.

**Rainfall**

The rainfall data of the last some years (Collected by Sahyadri Adivasi Bahuvidh Seva Sangh, Shahapur) shows that the average rainfall of the area is 2400 mm.

**Soil Cover**

As the area is hilly, undulating, with rather steep slopes, very thin cover of reddish soil is developed on the ground. In summer, area appears barren due to cutting down of trees on a large scale.
Geological field work

Reconnaissance survey was carried out on 23rd Feb.2000 and then detailed geological survey was carried from 7th to 10th March 2000. [The levelling survey, with the help of Dumpy Level and by Chain was also carried out to determine the exact location and reduced levels of various geological features occurring in the area]. For the sake of convenience, R.L. ‘0’ m. and Chainage ‘0’ m. is taken towards downstream of the waterfall [Fig No.5] as exact M.S.L. was not known.

Traverses

Traverses were taken along the bed of the Deobandh Tributary from Chainage ‘0’ m. towards upstream up to a distance of 2.52 km. Traverses were also taken in the adjoining areas.

The detailed studies of the geological features like Basalt Flows, Dykes [Table No.2; Fig. No. 6] and Fractures [Table No.3] were carried out during the traverses. The description of these features is given below serially.

i) From Chainages (-) 30 m. to 0 m.

Fresh, unjointed, massive Amygdaloidal Basalt is exposed over the entire bed of Deobandh Tributary.

Dyke No. N-1

It passes along the bed of Deobandh Tributary at Chainage (-) 30 m. Its trend is N 5°W - S 5°E having a thickness of 2 m [ Fig No.7 ]

A deep trough is formed along the dyke due to removal of joint blocks during the floods. A standing pool of water is occurring in the trough formed in the dyke.

ii) From Chainages 0 m. to 20 m.

In this stretch, fresh, massive, unjointed, Amygdaloidal Basalt is exposed over the entire bed of Deobandh Tributary.

iii) From Chainages 20 m. to 41.55 m.

A deep pool of water has been formed at Chainage 20 m. at the bottom of the major waterfall. Waterfall is horse shoe shaped having height of about 11 m. On the vertical cliff of the waterfall, fresh, unjointed, massive, Amygdaloidal Basalt is exposed. Due to unjointed nature of Amygdaloidal Basalt exposed in the vertical cliff, the face of the waterfall has acquired smooth appearance due to abrasive action of water.