“Morphostratigraphic study of Kanola and Pondhra Basins of Karmala Tahsil, Maharashtra”.

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Abstract: Watershed basins viz. Kanola and Pondhra in Karmala tahsil have been selected for proposed study. The absolute location of study area can be expressed as from 18°15’N to 18°31’N and from 75°47’E to 75°24’E Longitude. The study area lies in the rain shadow zone of Western Ghats in the middle Bhima basin. The present study deals with the morphostratigraphical setup of the study area. It gives idea regarding resource base, mainly land, soil and water. The study of socio-economic setup is necessary to understand how these resources are being used by the given population. This may be useful to design site specific watershed management programmes.

Key words: Resources; morphostratigraphy; landuse; watershed.

Introduction:

There is no any prominent hill range in the study area. However, the northern border of the Kanola basin shows high altitude about 620 m. The middle part of the basin is marked by gently sloping area with Mangi tank, a percolation tank due to the dam constructed across the river at village Mangi. The Second watershed basin is also chosen for the present, study that is Pondhra basin, running from north to south. It has generalized slope from north to south. The altitude ranges from 520 m to 640 m. Thus, both the basins show good potential for development using watershed management practices.

Slope is a significant factor in watershed management. It determines the agricultural activity and controls the amount of run-off as well as soil erosion. The direction of the slope is from west to east in the Kanola basin while it is from north to south in the Pondhra Basin. Large boulders are released and accumulated at the base of the hills. Steep slope, terraces and benches are common in this region. The tors are commonly observed. The average slope in the study area varies from 0.1 to 1.0. Several workers like Saptarshi (1993), Bhagat (2002), More (2008), Jagdale (2002), Ugle (2006) have carried out topographical and stratigraphical studies.

Study Area:

Pondhra watershed basin in Karmala tahsil has been selected for the study. The absolute location of study area can be expressed as from 180 15’ to 180 25’ N latitude and from 750 00’ to 750 10’E Longitude. It covers the area of Survey Of India (S.O.I) Toposheet No. 47N/03. The study area lies in the rain shadow zone of western ghat in the middle Bhima basin. The study area receives rainfall during South-West monsoon from June to September. The micro level distribution of rainfall shows variation. The southern part of area of the basin in village Sogaon receives 520 mm while northern part of the basin receives 600 mm rainfall.
Morphostratigraphic Study

It is interesting to carry out stratigraphic study of the region. It is based on toposheet and field observations at specific points of different slopes. So far as slope is concerned it is the generalized cross profile of the basin. This is based on number of cross profiles drawn across Kanola and Pondhra stream with the interval of 5 Km. Similar interval has been maintained for Pondhra basin. The field observations have been made regarding texture of the material covering the slope and type of vegetation cover present in the segment. Thus, land cover analysis based on slope and biomass has been carried out after Saptarshi (1993). The morphostratigraphy profiles for both the basins have been presented in the Fig. No: 1.1 and Fig. No: 1.2.

![Kanola Basin Generalised Morphostratigraphic Map](image1)

**Fig No: 1.1**

The representative profile has been developed on the basis of the data obtained in connection with the slope, land cover thickness of the soil and weathered mantle as well as the nature and type of vegetation cover. These observations were confined to ten selected sites. Five physiographic components of the landscape are clearly evident from the profile in both the basins. They are mainly:

a) The Mal Region,
b) Hill Top Surfaces,
c) Sloping Surfaces and
d) River Terraces.

![Pondhra Basin Generalised Morphostratigraphic Map](image2)

**Fig No: 1.2**
a) The Mal Region

The "Mal-ran" or "Mal Region" shows extensive areal coverage and is situated at the higher level, 500 to 620 m with average slope of about 3 to 4%. Thin soil cover with very low field moisture, even in the post-monsoon period, is responsible for the dominance of grasses and shrubs. The thickness of the soil is barely 5cm. It is underlain by a layer of weathered basalt. The well-drained soils lack moisture even 8 to 10 days after rains. The soil profile in this zone can hardly be called as a mature profile. This region needs Continuous Contour Trenches (CCT) work to check runoff and to improve water table.

b) Hill Top Surfaces:

The region, characterized by dome-like surface with a slope is categorized as the hill top surface. It is similar to mal areas. However it has less area with slightly more slope up to 5 to 6%. The zone coexists with the Mal-region in the same altitudinal zone. This is virtually a barren zone with near absence of soil cover. Accumulation of soil particles is limited to the cracks developed in the weathered basalt. The narrow patches of thin grasses are observed in such situations in the region. It may possible to improve grass cover in such areas by constructing trenches coupled with plantation of local species of trees and bushes.

c) Sloping Surfaces:

These kinds of surfaces are observed along the border zone above mentioned morphostratigraphic units. This unit is characterized by moderate to steep slopes (between 6 and 10%) and is unsuitable for any type of agricultural activity. By and large, the angles are steeper in the northern part of both the basins. The sloping surfaces are dominantly barren with thin grass cover and scattered shrubs. The biomass status may be improved if soil moisture is conserved for longer period in post monsoon season.

d) River Terraces:

The morphostratigraphic region, located along the Kanola and Pondhra rivers, is the only relatively favorable region for agriculture. This is belt of alluvium with thickness ranging from 30 to 300 cm. The analysis of soil samples from this region has revealed good nutrient status. The proportion of fine particles is more than coarser one. The boulders are rarely found. Due to thick soil cover with sufficient subsoil moisture, the biomass status of the region is better than those in the other four regions. Tree density is higher. However, population of trees is not as high as to be called forest. There are many varieties of monsoon deciduous trees of which Neem, Pipal, Tamarind, Babhul etc. are predominant. Further, due to low altitude, irrigation facility can be extended with low inputs. It is also a region having favourable site for surface water storage. The mangi dam in Kanola basin and Veet in Pondhra basin are the good examples of minor irrigation projects in the region.
Conclusion:

Thus morphostratigraphic study revealed the relationship between type of land use and land cover at micro level. This may be useful to design site specific watershed management programmes. Thus, it provides the basis for formulation of strategies and construction of suitable model for development.

References:


