

Geomorphic Regions of Bamanwas Tehsil District Sawai Madhopur (Rajasthan)

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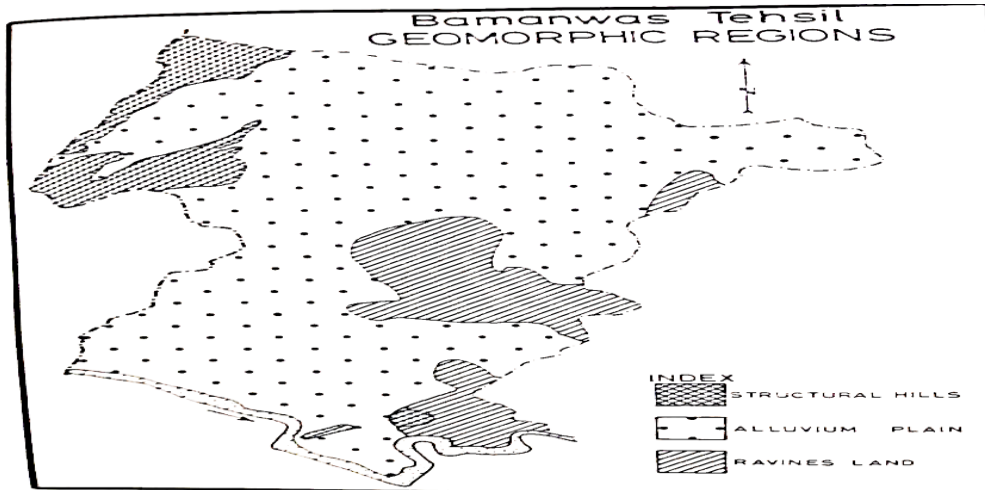
Introduction

According to Gellert (1981) "Geomorphic regionalization involves the delimitation, characterization and cartographic representation of general units of various rank and size orders." Geomorphic regions could be of immense value in planning and development, as various factors are taken into account while delineating these regions and units. The true potential of an area could be evaluated through minute investigation of geomorphic region and its units.

In the present study, a scheme of geomorphic regions of Bamanwas tehsil has been presented taking geological history and structure, lithological variations, slope, form of ground, quantitative properties of streams and surface morphology.

On these basis two major geomorphic regions with three sub-regions have been delimited (Fig. 1).

These geomorphic units have different physical potentials and provide a sound base for rational land use, soil and water conservation planning and development of the tehsil.



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1. The Hill System

(A) The Aravalli Structural Hills

(a) Narayanpura Tatwara- Malarna Dungar Hills

(B) The Lalsot-Bayana Hills

(a) Ashanand Tank Hills

(b) Moran Dungar -Liwali Hills

(C) Inter Mountain Valleys

2. The Low Land System

(A) The Alluvial plain

(B) The Ravine Belt

1. THE HILL SYSTEM

The Bamanwas tehsil lies on the eastern slope of the Aravalli ranges, The Aravallis is whole tehsil except some patches in north. The south portion of the tehsil Comprises of Low hills. The slope of the hills are gentle.

The main geomorphological characteristics of the Aravalli hills in the tehsil are highly dissected. They are usually flaty topped with an average height of 240 to 360 metres.

(A) The Aravallis Structural Hills

(a) Narayan pura Tatwara-Malarna Dungar Hills:

The Narayan pura Tatwara hills extend in the south west part of the tehsil. The hills are in a continuous chain running from Goth (near south west boundary of tehsil) to Kareli river bed. The hill is represented by two prominent ridges namely Goth and Kondli, These are mainly composed of quartzite's, gneiss and schist.

The Malarna Dunger hills is the eastern extension of these above mentioned hills which is running from Cuazi Kundi to Nananwas villages (26.34': 76°.20'). These are mainly composed of gneiss and schist. This hill range is represented by three ridges i.e. Morpa ridge, Jharada and nananwas ridge.

The height of narayanpura- Malarana Dungar hills are generally more than 315 meters. The maximum elevation of Goth hill near Malarna Dungar is 371 meters. The height of nananwas hill is 315 meters, while the rest of the hill crest ranges from 315 to 362 meters. The se hills extend in south west to north east direction. The southern slope of the se hills is more steep than northern slope.

In the region the Morel and Kareli rivers are monsoonal rivers. The Morel river has cut across the Aravalli hills and forms the Malarna Dungar gap. The drainage pattern between two hills is more or

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less rectangular. Average drainage density and stream frequency of this region are 5-4 km/sq.km and 2 to 6 km/sq.km respectively. The hills are covered with the open scrub forest, which has been depleted in the last few years.

(B) The Lalsot Bayana Hills

The Lal sot Bayana hills in the tehsil enter from Toda Gurjar and form the district boundary lines of Jaipur with Sawai Madhopur. Here two off shoots are visible. The hills are composed of the Alwar quartzites and pre-Aravalli hills. The arkose grits as well as quartzites and pre-Aravalli gneiss. The arkose grits as well as quartzites are seen here. The base rocks are arkose, conglomerate and orthoquartzite. These pre-conbrian rocks are worn down by erosion into sharp serrate edges hills and small ranges of low relative relief.

These hills are found in two separate Dungar separated by a narrow valley. First is Moran Dungar and second is Liwali hills.

Moran Dunger lies along the district boundary of the Sawai Madhopur to Jaipur. The hill is moderately plateau type and has a narrow width and height of 500 to 540 meters. This hill is narrow in south and width increases as we move towards north. Highest peak of this hill is near Bhalnsala Ka Dera (564 meters). south portion of this hill of low attitude and north portion of the hill has high attitude.

Second range of this system is Liwali hills separated by a valley. Near Lewali these hills are widest with the highest peak of 527 meters. From here a narrow chain goes toward the north east and abruptly breaks at Moran Sagar. In Todabhim tehsil it again attains a good width and height of 439 meters.

This hill is known as ASHANAND TANK HILLS and near Moran sagar (North portion) known as ROLETA DUNGAR.

The relief of Lalsot Bayana Hills ranges from 200 to 220 meters and the slope values ranges between 1°-4°. At the foot hills, a Scree material has covered the slopes. These are top flat hills and have steep cliffs on the east ward side and have intermittent valleys.

The drainage is interesting in many respects. The arrangement of quartzites and arkose has given rise to anticlinal ridges and synclinal valleys. Numerous rivers and rivulets originating from the unnamed peaks flow to the north and south east and join the Gambhir, Morel and Moran Sagar. Kareli nadi originates from Lalsot hills near Amarwas and takes its shape from Moran Sager, ultimately making confluence with the Morel in south east. The structural features dominate the region and the trend of the flow of drainage is exactly in alignment with the structural features. This region witnesses trellis drainage pattern in the south and parallel and centripetal in the north. The average drainage density and stream frequency are comparatively higher than the Malarna Dungar hills, i.e. 4 and 6 streams/sq.km respectively (which can be called as high category drainage).

(c) Inter Montane Valleys

These valleys consist of the pre aravallies. The Inter-Mountain valleys almost run parallel to

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the structural hills of the Moranika Dungan and Liwali hills of west of Bamanwas tehsil. The valleys are filled with sediments and gravels brought from the Alwar shales of Delhi super Group. The valleys are flat in the bottom and have convex slope in the both side. The valley is occupied by the dense settlement and agricultural land.

The valleys are long and narrow, therefore, they have an irregular drainage pattern. The trellis pattern is the most common because rills and fingertip streams run down and join at right angle with the main stream. The drainage density and stream frequency are medium ranging from 1 to 3 and 2 to 6 strems/sq.km respectively.

(2) THE LOW LAND SYSTEM

The vast monotonously flat to gently undulating, low land system of the tehsil covers whole tehsil except North most and south portion of the tehsil Viz Kareli basin and East of Moran Sagar basin. The lowland system may be divided into three micro-geomorphic regions namely, the alluvial plains, the ravine belt and the sandy alluvial plain region.

(a) The Alluvial Plain

Largest area of the tehsil is covered by recent and sub recent deposits. A broad expanse of alluvial plains of rivers Morel Banas, Kareli and their tributaries which were deposited in the Pleistocene cycle of erosion. But now these rivers are being actively, engaged in under cutting their own deposited sediments. The source of alluvium are the upper Bhandar sand stone rocks, Delhi Super Group and Aravallis rocks.

This region has a natural gradient to the east and south which is obvious from the natural flow of the Morel and Kareli rivers. Only the some rivalets flow from south to north in north portion of the tehsil and they merge in the Moran Sagar. The plain varies in elevation from about 240 meters above sea level in south part to 260 meters in the north east.

In this geomorphic unit there are only a few permanent streams viz. The Morel and the Kareli but ephemeral channels are numerous. The water of the north of the Morel or Liwali hill region are collected by nallahs of Moran sagar whereas water of eastern part of tehsil is collected by Kareli Nadi.

The larger streams exist with the dendritic drainage pattern while the radial patterns are observed on domal structures of the Aravallis. The drainage lines are lesser on the south along the Morel River. But the confluence point of the Morel and Kareli, has the highest drainage density (5.00) and stream frequency. Second highest drainage density and stream frequency zone is inter montage valley system. The slope value is also the lowest up to 1.5°

The flatness of the area bears the highest agricultural value. It does not allow the expansion and bifurcation of streams into smaller channels and thus the larger stream exists with the dendritic drainage pattern.

(B) The Ravine Belt

Almost all the streams of this region show intense gullying and ravine erosion. Most of the ravines

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are concentrated in the plain area. Here the Aravalli shale and Schist are most vulnerable to ravine erosion. Recent and sub recent alluvium is also common for intense ravine erosion.

The three ravine areas are the observed in tehsil, i.a. the Kareli-Bhai Ka nala area, the Morel kareli confluence area and inter-mountain Sager area. The intensity of ravine erosion seems to increase as one proceeds down streams along all the rivers.

The elevation of ravine areas differs from place to place. In the Kareli Bhai-Ka-Nala area, it is 240 meters to 260 meters. The intermountain valley-Moran sagar area it is 300 meters.

Being a highly dissected and denuded topography the highest drainage density prevails in the northwest and Kareli ravine areas. The stream frequency also shows the same pattern of existence with highest value above 3 along the inter motane valley and decreasing below 2 in the north of the Kareli and Morel.

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Reference

1. Asthana, V.K., (1967), "Morphometric evaluation of land forms of Almora and its environs". National Geographical Journal, India, Vo. 13, PP. 37-45.
2. De, N.K., (1982), "Land Classification: A Study in Applied geomorphology in perspective of Geomorphology" (Ed.), by H.S. Sharma, Vol III, PP. 179.190
3. Dillon, S.S., (1977), "The impact of land forms on Agricultural land use in Manasu District (Himachal Pradesh)" Geographical Review of India, Vol 39,2, June, P. 183
4. Gardiner, V.C., (1981). "The Impact of climate on fluvial system" Perspective in Geomorphology. (Ed.), 3. H.S. Sharma, Concept publishing company, New Delhi.
5. Government of Rajasthan, (1981), "Sawai Madhopur District Gazetteer".
6. Leopold, D.B., Walman, M.C. and Miller, J.P., (1964, "Fluvial processes in geomorphology. "San Francisco. WmH. Freeman
7. Rai, R.K., Patnaik. S.N., Panda, P. and Singhavi, V., (1981), "Hill slopes, Land use and soil erosion around shilling (Meghalaya), "Geographical Review of India.
8. Seth, S.P. and Carg, C.K., (1972), "Report on survey and Categorization of wastelands in sawai Madhopur District". Department of Agricultural Report.1.
9. Shafi, M., (1969), "Land use planning, land classification and land capacity. "The geographer, Vol. XVI.
10. USDA (1978), "Soil taxonomy agriculture handbook. "No. 436, Soil conservation service, wash intron, D.C. (USA)

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