

Delimitation of Micro-physiographical Region for Regional Planning and Development (District Nagaur, Rajasthan)

Varun Binda*

Department of Geography, National Defence Academy, Pune, Maharashtra, 411023

*Corresponding author: varunbinda27@gmail.com

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Abstract In developing countries like India disparities among the level of development at the regional level is highly uneven. So its emerge as a new research area for the regional scientists. The main target of the author with this approach to identify the Micro-Physiographical Regions to reduce and eliminate the disparities in Nagaur District of Rajasthan (India). With the help of Micro-Physical Regions, policy makers can easily solve out the problems of regional imbalance. In this research paper, author try to find out the Micro-level planning regions of the concerned area with help of geographical, social and economic factors. The research has been divided into four physiographical regions using the above factors and superimposed technique.

Keywords: regional development, micro-physiographical region, super imposed technique, regional disparities

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1. Introduction

In the India disparities in development among the different areas are very high. These disparities have mainly resulted of uneven and unplanned development. The development should be found in the hierarchy pattern, it must be started from the higher level and reached to grass root level. These disparities can be eliminated from any area if the development reaches the grass root level. In the recent time, governments are trying to work on the above theme. To achieve this all-round development the governments are trying to develop micro-regions. For this, they use different types of parameters like geomorphology, geology, climate, soil, resources etc. The main target behind the formation of these micro-regions is to conquer balanced economical and sustainable development. It's also focus to ameliorate the techniques of regional planning. In this research paper to prepare the effective regional planning at the district level, the author tries to delimitate micro-physiographical region. For the formation of these micro-physiographical regions geographical, social and economic factors are necessary. All the regions have one common thing that is areal homogeneity.

2. Study Area

The study area (Nagaur District) is located in the centre of the Rajasthan State. It is extended from 63°05' to 75°22' Eastern longitudes to 24°37' to 26°00' North latitudes. It

contributes 0.53% (17,718 km²) area in the total area of India (Figure 1). It has also 1485 revenue villages. According to Census of 2011, the total population of the district is 3,30,9234 with the sex ratio of 947 females on per thousand males. The density of population of the district is 157 persons per sq. km. The decadal growth rate (2001-2011) is +19.29 percent. The rural-urban composition of the population is 2,67,4804 and 63,4430 respectively.

Nagaur district is a part of the great Indian "Thar Desert". It lies in the semi-arid tract of Rajasthan State. This area is popularly known as 'bangar'. The general landscape is one that is covered with a thick mantle of sand-dunes locally known as dhoras and tibbas. The general elevation is about 300m. above mean sea level varying from 150m in the north to 640m. in the south showing a general slope towards the west.

3. Findings and Discussion

By the assessment of the graphical representation and association with the data generated in the acclamation of the various terrestrial features within the study area directed to the identification of some positive patterns of similarity in the special distribution of the various geographical factors, so certain units which have been termed as the physiographic units. These units have individual set of characteristics in respect of different parameters like geomorphological features, surface relief, soil texture, land use, underground and surface water status. All these units also have specific problems and potentials.

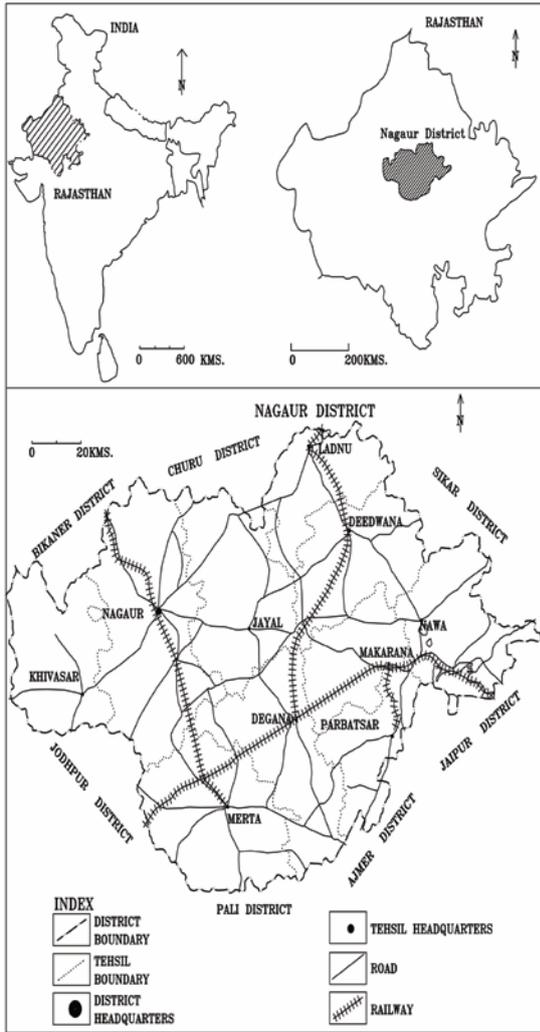


Figure 1.

4. Methodology

For the delimitation of the physical region of the Nagaur district, the author mainly uses cartographic technique. In this technique different physical characteristics identify by the superimposition of various belts like geology, relief, forest, slope, soil texture, drainage pattern, drainage

density, sand dunes type, wasteland, land use, and rainfall boundaries show some uniformity.

5. Delimitation of Micro-Physiographical Region

With the help of superimposition technique Nagaur district has been recognized and mapped in four major physiographic regions (Figure 2). These are as follows:

- 5.1. Western Sandy Arid Plain Region
- 5.2. Plain of Interior Drainage Region
- 5.3. Eastern Aravalli Ranges Region
- 5.4. Luni River Drainage Region

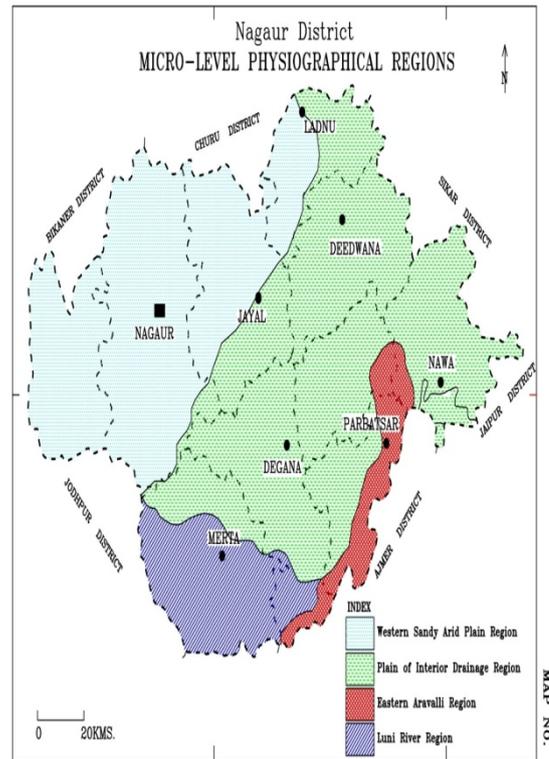


Figure 2.

Main qualities and assessment of these three physiographic regions are as follows:

Table 1. Micro-Physiographic Regions of Nagaur District

Characteristics	Physiographic Region			
	The Western Sandy Arid Plain Region	The Plains of Interior Drainage Region	The Eastern Aravalli Ranges Region	The Luni River Drainage Region
Geographical Area in (Sq. km) With (%)	6526 Sq. km. (36.43%)	8690 Sq. km. (49.44%)	754 Sq. km. (4.26%)	1748Sq. km. (9.87%)
Geology	Marwar Super Group	Delhi Super Group mainly includes Erinpura and Malani Group	Delhi Super Group mainly includes Alwar and Ajabgarh Group	Marwar and Malani Group
No. of Villages in the region	476	901	93	105
Soil	Sandy	Clay Loam	Sandy Loam	Clay Loam
Slope from MSL (Meters)	150 to 350	200 to 550	600 to 700	200-300
Annual Rainfall (MM)	150 to 500	300 to 450	450 to 600	300 to 450
Population (Census 2011) With (%)	950502 (28.74%)	2039238 (61.65%)	141999 (4.29%)	176004 (5.32%)
Population Density (Per Sq. Km)	146	245	188	101
Ground Water level (Meters)	>40 m	20-40 m	>40	30-40
Status of Ground Water level	Critical	Over Exploited	Over Exploited	Over Exploited
No. of Households	158417	364868	26190	29334
Total Literacy With (%)	472690 (49.73%)	1134555 (55.64%)	71525 (50.37%)	79854 (45.37%)

(Calculated by Author).

5.1. Western Sandy Arid Plain Region

This region has the lowest relief ranging from 150 to 500 meters above m.s.l. this is covered with high permanent sand-dunes which are part of the dune systems of Bikaner in the north and Jodhpur in the west. This region lies in Nagaur and Jayal tehsils in the north and in the north part of Merta tehsil in the west. Around Shyamasar, Rohini, Jhodyasi, Kherat, and Deh, these dunes have their highest culminations averaging 15 to 30 meters in height. Much of the land is barren and uncultivable in these areas as the fossilized dunes having steep slopes are devoid of groundwater and it is hazardous to cultivate them in the face of increasing wind erosion. Rainfed agriculture is only possible in the interdunal areas in this region.

5.2. Plain of Interior Drainage Region

This is the largest area of the district occupying nearly 50 percent of the total area. The general slope is from north-east to south-west with a gradient not exceeding. However, in the east near Kuchaman, Budsoo, Bhinchawas, and Manana the slope ranges from 2° to 5° due to the accumulation of sand on the ridges and the piedmont plains. In the west and south-west as around Mundawa, Kuchera, Nimbri, Patri Jodha and Khajwana the landscape is a levelled plain.

The vast array of sand lies in the south-west north-east is along the line of prevailing south-east winds which blow for the most part of the year. The railway line connecting Jodhpur and Phulera is roughly the dividing line to the north of which the sandy plains of Aeolian sand lie. Thus one finds that to the north of Gothan, Merta Road, Ren, Degana, Makarana, and Nawa the landscape is full of undulating sand-dunes with minor interdunal plains and gullies while to the south of these towns the levelled plains are mostly of older alluvium with a developed and disturbed drainage system. The southern extensions of the sandy plains are also noticeable in the south of Degana around Kitalsar, Jawala, Kurada and gular in minor areas.

5.3. Eastern Aravalli Ranges Region

Small protrusions of these ranges, which run through most of the part of Central Rajasthan in the south-west to north-east direction, occur in Parbatsar, Makarana, Nawa, Degana, Pachora, Maroth and Rewasa towns and villages. South of Parbatsar near Piplad these ranges show their highest culminations (663 m.). On the borders of Ajmer district in the south, these ranges are of low heights ranging from 300 to 400 meters. Near Makarna these ranges are of 600 to 700 meters in elevation and it is here that the world-famous Makarana marble is quarried.

5.4. Luni River Drainage Region

This region lies in the southernmost part of Nagaur district. Nagaur district does not have any perennial river, except Luni river which flows into a very small portion in the south of the Nagaur district. After originating from Ajmer hills (Nag Hills) the river enters Nagaur district

near Ladpura village and after travelling only about 30Km it turns southward and enters Pali district. The River has a sandy bed which has rich aquifers and hence underground water is exploited. The highest density of the drainage is near the Aravalli hills in the south-East part of the district and it goes low in the western part of the district.

A detailed study of these broad relief features indicates that minor localized variations occur in various parts of the district. Besides the relief, the geology, soil cover, groundwater, surface water, vegetation and the anthropogenic use of the region for a long interval of time has altered the general landscape in small regions. It is also believed that a greater part of western Rajasthan, west of the Aravallis, was covered by an arm of the Arabian Sea as evidenced by fossil records of Jaisalmer (Akal Wood Fossil Park). It is possible, therefore, that the remnants of the older sea now exist in the form of saline lakes of Sambhar and Didwana. It is interesting to find that all-lakes are located in the local saline depression and the salinity diminishes in them gradually away from the main salt basin.

6. Conclusion

The micro physiographical regionalization is a very effective technique, for the preparation of the regional policies at the grass root level. The spatial interactions express relation among geographical regions at different hierarchical levels and they are important factors in the formation of the geographical organization of space. In this paper author try to provides brief and comprehensive analysis of the construction of physiographic regions. The final conclusion of this study is the delimitation of micro-physiographic regional systems in Nagaur district with the help of physiographical regionalization map. To delimit micro-physiographic regions in Nagaur district on the basis of super-imposed cartographic technique data collected from numerous government and non-government departments is the main objective of this paper. Finally, the socio-economic and demographic conditions should be assessed before accepting a delineated boundary for a region. This will help in the assessment of the level of development of these regions. Further, with the help of a suitable plan, the integrated area development of the region can be achieved.

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