

Study of the Shape and Form of Villages of Dungarpur District (Rajasthan)

Dr. Santosh Chharang¹ & Dr. Varun Binda²

¹Research Scholar (PDF,UGC), Department of Geography, University of Rajasthan, Jaipur, India.

²Assistant Professor, Department of Geography, National Defence Academy, Pune, India.

Abstract:

The external appearance of the village is related to several geographical and cultural factors. Water bodies, relief street, and other social amenities are mainly responsible for the arrangements of dwelling units. The morphogenesis of these settlements becomes interesting, as the village's overall form leads to various related phenomena responsible for the evolution of the present form. The form and shape of the villages in the present study have been determined based on the primary data and statistical method of shape index calculation. In this research, the authors attempt to highlight the form and shape of the villages and factors responsible for them.

Keywords: - Villages, Shape, Form, Dungarpur district.

Introduction:

The external appearance of the village is related to several geographical and cultural factors. The arrangements of dwelling units is guided by water bodies, relief street, and other social amenities. The village cart-tracks and lanes from the selection internal layout of the village. The buildings located in the space within the skeleton determine the shape and form of the villages.

The morphogenesis of these settlements becomes interesting, as the village's overall form leads to various related phenomena responsible for the evolution of the present form. The village's general pattern may be identified after the study of village forms from topographical sheets and revenue maps of sample villages.

Objective:

- 1) It attempts to highlight the factors affecting the shape and form of villages.
- 2) The study intends to assess the shape and form of villages.

Hypothesis:

- 1) Various factors are mainly responsible for the development of different shapes and forms of villages.
- 2) The shape and form of villages within a specific area are not always uniform.

Methodology:

The form and shape of the villages in the present study have been determined based on the primary data and the statistical method of shape index calculation.

The Study Area:

Dungarpur district is located in the southern part of Rajasthan. It covers an area of 3780 sq. Km. Dungarpur is predominantly rural, as more than 92.70 percent of the population lives in villages. The total population is 13.89 lacs, and population density is 179 as per the district's 2011 census. Climatically, the district may be classified under sub-humid to dry sub-humid. An undulating flat-topped Deccan trap and elongated Aravalli hills are the main characteristics of this area.

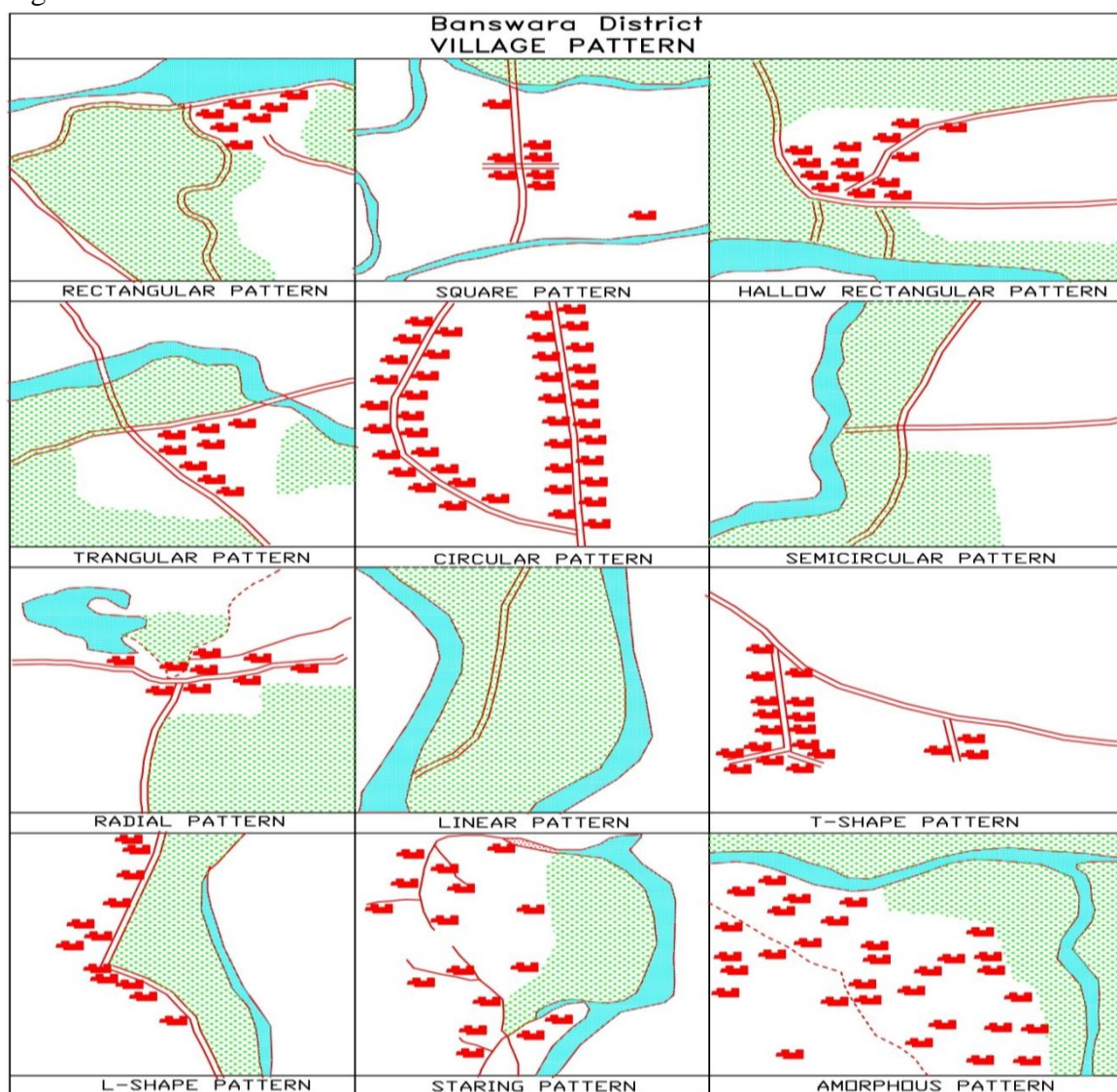
The Shape and Form of villages :

The form and shape of the villages in the present study have been determined based on the above observations and the statistical method of shape index calculation.

1. Empirical study:

The following pattern may be observed from the general observation of topographical sheets and selected villages' study. These have been shown in Fig.1.

Fig. No. 1



I. Rectangular Pattern:

From the study of over a hundred patwari maps of the study area, authors identified that the villages' general form in Dungarpur district is rectangular. Most of the nucleated villages represent this pattern. The general factor responsible for this pattern has been the distribution of cultivated fields. It is also the most straightforward development pattern because the dwelling units are generally constructed within a rectangle or square. The array of hutments are constructed along with the streets or water bodies, and a rectangle form of the villages develops.

The rectangular form has developed along with a large tank which restricted the growth in the north. A katcha cart-track runs at a comparatively higher ground in the west, also acting as a barrier. Thus the village grew only in the south and east part of the study area.

II. Hollow Rectangular Pattern :

This pattern is similar to the rectangular pattern, except for a hollow space in the center. The rectangular pattern factors remain the same, but empty space is created due to special physical or cultural conditions. The presence of a pond or water tank, a temple, or a peepal tree with open space for people gathering accounts for the vacant space. The place of worship is an essential element, in a tribal village.

The village Baroda situated along the bank of a stream, has also developed a rectangular pattern. Still, the presence of a small tank inside the village has provided a hollow space. There is a small temple on the bank of the tank with open space around. The main factor for developing a rectangular pattern has been the presence of a river in the south and a cart-track running parallel to it on the high bank.

III. Triangular Pattern:

The triangular pattern develops due to the presence of strong physical barriers on either side. i.e., roads, rivers, hills, etc. which control the growth of the settlement. The village Phawta represents a typical triangular pattern, bounded on two sides by roads, leaving only the diagonal direction for growth. A Nala also runs in the north in a meandering course in the east-west direction. Thus in the north, the land between the road and Nala is liable to flood, and no development is possible. The road running from north-west to south-east affects the growth in this direction.

IV. Circular Pattern:

An exact circular pattern is rarely found in the study region. It may be partly circular and can be identified in the case of agglomerated or compact settlements. The circular form of these villages is mostly related to the road pattern and physical factors. The main reasons for developing such a pattern are the meandering river course or water bodies and curved roads.

The Sanchiya village, which has developed along the curved road, represents a semi-circular pattern. However, the new development along the bypass road has destroyed the shape as most of the new development occurs along this road.

V. Radial Pattern:

The radial pattern is somewhat similar to the circular pattern with slight modifications. The village is guided by radiating cart tracks and lanes with a well-defined convergent point. Such a pattern is found in the case of essential villages, mainly service centers, where converging roads are marked with an important central junction like marketing, schools, hospital, or other such functions. The village Tamboliya represents a typical radial pattern. The village is located at the foothill, where forests are present in the south and south-east. In the north-west also there is a small hillock. Five cart tracks converge at this village, which has developed in a fan-shape along the tracks.

VI. T-Shape, L-Shape or String Pattern :

The linear pattern of villages develops along streets or rivers in a continuous row. Its shape varies on the factors responsible for its growth. Thus different linear patterns have emerged as shown in the map. T-shape pattern mostly develops at the road junction points, while string pattern develops along streams. On major roads, street pattern of settlement can be identified. The village Samaliya represents a typical linear settlement pattern. Here two rivers run parallel, and a cart track runs at the water divide of the streams. In the other village, the Ramsagra T-pattern of linear settlement can be noticed. The hutments have come up along the cart-track, making a small T junction. In the village Bankora, the existing cart-track forms L- shape, so the hutments have been constructed following the cart-track.

VII. Amorphous Pattern:

The amorphous village pattern is most common in Plateau, Hills area' and Mahi trough region. In these areas, settlements consist of numerous hamlets scattered over the revenue village. Though each hutment itself is rectangular, their relative arrangement is so irregular that no pattern emerges. Hence such a settlement can be termed as amorphous. Such a pattern is a common phenomenon in the tribal area. The village Manpur represents a typical example of such a type of development pattern. Here hamlets are scattered all over the revenue village area, with concentration near-cart track and water bodies.

2. Shape Index Analysis :

A geometrical pattern of the rural settlements can be measured in terms of the approximate geometrical shape of the revenue village boundary. The analysis of shape and form was first initiated by Thomson and used by Miller to shape drainage basins. In his study, Miller concluded that the shape of a drainage basin was expressed as the ratio of the area of the drainage basin to the area of the circle having the same perimeter as the basin.

$$\text{i.e. } S = \frac{AB}{AC}$$

where S = Shape Index

AB = Area of the drainage basin

AC = Area of the circle of the same perimeter as of drainage basin.

Haggett also applied this formula in his shape analysis of Brazilian countries but by a modification. Accordingly, the shape index S of a village may be expressed as the ratio of the village area, say A to the area of the circle with the longest axis (L) as diameter.

So that

$$S = A/\pi r^2 = 4A/\pi L^2$$

Rasheed(1998) has also adapted the above formula of Haggett in shape analysis of 19 districts of Bangladesh. The above analysis has been used in the present study taking revenue boundary of all the 858 villages of Dungarpur district. In this analysis, the value of S for three theoretical lattices is 0.42 for a triangle, which is 0.62, i.e., S = for square, 0.82 for the hexagon, and 1 for circle. The result of the above analysis is shown in the following table.

Table 1
Showing shape index and percentage of villages in each Tehsil

Shape Index	Dungarpur Tehsil	Aspur Tehsil	Sangwara Tehsil	Simalwara Tehsil	Remarks
> - 0.9	8.6	5.9	5.4	3.4	Elongated
0.7 - 0.9	14.4	10.5	8.7	12.5	Triangular
0.5 - 0.7	33.6	21.6	11.4	17.2	Square
0.3 - 0.5	23.9	22.4	32.2	28.4	Hexagonal
< - 0.3	19.5	39.6	42.3	38.5	Circular

(Calculated by Author)

The above table reveals a general lack of regular hexagonal shape of the villages in the study area. A variety of shapes from the elongated triangle, square to circular can be identified and physical characteristics of the area, such as rivers, hills, water bodies, etc controlled these shapes. This effect can be visualized from the analysis of the shape index values in different tehsils. The presence of many streams has been the governing factor in deciding the shape of the villages throughout the district, especially in the Mahi Trough, Hill region, and Plateau, where the percentage of villages with elongated shape is more than 38. The proportion of the triangular shape of villages varies from 22 to 28 percent in all the tehsils. This shape is the outcome of the intersection of two tributary streams defining the village boundary. The square shape of villages is about 33 percent in the Dungarpur tehsil and 21.6 percent in the Aspur Tehsil. It is due to fair relief features and the least drainage dissections. The hexagonal villages' proportion varies from 32.2 percent in Sangwar tehsil to 28.4 percent in the Simalwara tehsil. Their growth does not reflect any planned or systematic growth pattern. This shape has come as a chance factor depending upon the local physical conditions. There is a general lack of circular-shaped villages as nowhere they are more than 8.6 percent. This shape has come from river meanders, not many in the study area, but maximum in the plains region.

Housing Characteristics:

Housing, next to food, is the essential requirement of man. It is the first step representing man's superiority over the natural environment. A house has a great cultural heritage as it means man's constant struggle for his survival over the natural environment. In his efforts to

shelter himself against the extremes of weather and climate, he has, over the ages, evolved many types of dwellings. The accumulation of houses marks the origin of human settlements. Their character is, therefore, related to the environment and the cultural heritage of the people.

Classification of house types :

The classification of house types can be attempted based on building materials, nature of the accommodation, and detailed layout plans. There is a marked difference in all the above characters, both in the rural houses and the urban houses. While most urban houses are pukka and well-built, the rural houses are generally hutments representing typical Indian patterns.

House types according to building materials:

The construction and style of houses largely depend upon the availability and use of different building materials. The different building materials are used for roof and walls, and a combination of these two defines the various groupings. However, the following table shows the classification of houses in Dungarpur according to different building materials.

Table 2

	Pukka	Kachcha	Thatched	Total
Rural	12970 (10.17%)	75631 (58.30%)	40014 (30.84%)	128615 (100%)
Urban	5321 (59.52%)	2510 (28.11%)	1096 (12.27%)	8927 (100%)
Total	18291 (13.29%)	78141 (56.83%)	41110 (29.88%)	137542 (100%)

(Source-Directorate of Census Rajasthan, 2011)

The above table shows the absence of Pukka houses in the district. In the rural areas, only less than 10 percent of the houses are Pukka, and about 28 percent of the houses are thatched with roof and wall, both made of reed, wood, grass leaves, etc. About 62 percent of the houses are Kachcha made of mud walls and tiled or thatched roof. In the urban areas, the condition is somewhat better as about 60 percent of the houses are Pukka and the remaining Kachcha or thatched houses. The dominance of Kachcha and thatched houses is mainly due to the weak economy of the people.

Housing Design and Layout :

In Dungarpur, the cultural environment becomes more effective due to its tribal organization. There are marked differences in the house types of tribal and non-tribal populations. However, socio-cultural heritage, local building materials and physical factors have a significant role in the housing pattern. The houses vary in size and pattern from a pukka palatial building of landlords to a single regular room or hut. The most dominant housing pattern in the rural countryside comprises small-sized hutments called 'taparas' scattered over the entire village. Out of the total rural houses, about 70 percent are one-room taparas and 24 percent two-room taparas. The three or more room taparas are generally

lacking and mostly belong to village landlords or surpanchs. Based on the size, accommodation, and design pattern, the houses can be grouped into the following categories.

1. One-Room Taparas:

In this dwelling type, there is only one room generally built of thatched roof and mud wall. They represent a rudimentary form of the compact house where human beings and animals find shelter under the same roof. Such houses generally belong to the impoverished people mostly engaged in non-agricultural activities like hunting, foresting, etc. They are also common in the Hill region. The availability of flat land for housing is scarce in urban areas; such houses generally belong to the laborers or daily workers. A typical plan of the hut of this type shows that all the activities like sleeping, kitchen, storage, etc. are limited to one room.

2. One-Room and Courtyard House :

This type of housing is most dominant among the Bhils due to its cheapness and open space. The general plan consists of a hut and enclosed free space around. This free space is used for cattle, cooking, and sleeping at night in summer. The hut generally is used as a bedroom-cum storeroom.

3. One-Room with Verandah/Kitchen:

In this type of house, a thatched roof verandah is also constructed in the front portion of the main hut. This verandah has multi-purpose uses, such as kitchen, cattle shed in winter, and guest room or elderly person's bedroom. They are also used for keeping fodder. The one-room hutments are related to the single-family structure, where the nature of accommodation and construction material depends on the occupant's economic condition.

4. Two-Room Taparas:

As mentioned earlier, the majority of the tribal, rural houses are single room taparas because of the single-family structure's dominance. Generally, after the marriage, the couple shifts to a newly constructed taparas of his own. Thus the two-room housing units are mostly attached to the men of business or upper-class families. In all, about 24 percent of the total rural houses in the district are two-room tenements. The proportion of two-room houses are more in the Western plain. This type is mostly related to the distribution of the tribal population. A typical layout pattern of a two-room tapara can be studied from the plan.

5. Multi-Room Taparas:

The multi-room houses are very few in rural areas of Dungarpur. They are mostly concentrated in the Western Plain. In tribal areas, such houses belong to village sarpanch or Mukhia. These houses' general plan consists of big size bedrooms, a storeroom, a kitchen, and a covered cattle shed.

In a few cases, such type of housing is found due to family structure. Several huts are arranged either in a line or L shape or U shape, belonging to different adult members of the family. They may be for various uses also. These houses are generally made of mud walls and thatched or tiled roofs.

Conclusion:

The present paper attempted to analyze the shape and form of villages of the Dungarpur district. It can be inferred from the previous discussion that the housing character in Dungarpur district is closely related to the economic condition and the socio-cultural relationship of the people. The physical conditions marked with the dissected and undulating land surface have also been responsible for the dispersed and isolated houses' distribution. The dominance of one-room tapara in the rural area is due to families' disintegration where every adult has his hut and own earning.

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