

SPATIAL DISTRIBUTION PATTERN OF RURAL SETTLEMENT IN THE PAINGANGA VALLEY, VIDARBHA REGION

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Settlements are the most distinctive form of the cultural landscape. It is man-made habitat on the earth's surface, "representing an organized colony of human beings including the buildings." The study of the distribution of rural settlements has occupied an important position in the historical development of geography. The Painganga Valley of the Vidarbha region of Maharashtra State (India) is selected as study for the present investigation. The investigation is an attempt to hierarchical patterns of rural central places in the Painganga Valley (20°30" N to 19°0" N latitude and 76°0" E to 79°0" E longitude). Administratively the region consists of 28 tahsils and 2208 villages and 183 rural central places with rural area of 16,610 Sq.Km. i.e. 7 per cent of the total area of the Maharashtra State. The Painganga Valley region of Vidarbha, constituting a part of Deccan Plateau of India. The elevation already established by it ranges from 200 M - 600 M. The soil of the region Vidarbha in the Painganga Valley is generally sound black. The average rainfall in the Valley is 999 mm.

The detail interpretations of all these different sizes need to be understood. The types in various categories based on number of villages or on strength of population, which has influenced the formation of villages has to be understood. It is very regional in types as well as in pattern of distribution of rural settlements. It is unique and has personality of its own. But general conclusions from specific facts and indices the measurements have been made to interrelationship among the rural settlements with the help of size, population, area and spacing. Through these findings and other consideration an attempt has been made to measure the degree of concentration and to classify the rural settlements in different types in the Painganga Valley of the Vidarbha region. The rural settlements in the Painganga Valley are classified on the basis of arrangement.

OBJECTIVE-The objective to examine is the influence of physical factor such as physiography, climate, soil, relief and vegetation, forest on the type and pattern of rural settlements in the study areas.

The study in general, is the structure of rural settlement patterns of the study area.



Map No. 1

METHODOLOGY-The statistical technique i.e. Quantitative Method is used for determining the pattern of rural settlements in the Painganga Valley of the Vidarbha Region. The Nearest-neighbor statistics have been employed to reveal the distributional patterns of rural settlements in the Painganga Valley.

EXPOSITION

Distributional Pattern of Rural Settlements - Various methods have been used for measuring the

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patterns of rural settlements. Usually quadrat analysis and nearest neighborhood analysis are used for measuring the patterns of rural settlements in the Painganga Valley of the Vidarbha region. As already mentioned in the earlier para, the plant ecologists, who have pointed out the effective distribution pattern, have used the model. The distribution of rural service center depends upon both natural phenomena and impact of cultural development on its hinterland and vice-versa. An attempt has been made here to measure the distance and the pattern. Taking basis to observe mean of the nearest inter-village in straight line distance (r_o), village density (d) and expected distance (r_e). This model indicates the degree to which any observed distribution of settlements deviate from what might be expected, if the points were distributed in a simple random manner within the same area. Plant ecologists Clark and Evans (1954) originally devised the formula for measuring the distances (R) has been used.

$$R = \frac{rA}{rE}$$

Where, R is the neighbor index
 rA = is the observed mean distance between the nearest neighbor rural settlements

$\frac{N}{A}$
 $rE = \frac{N}{A}$ = The mean expected distance
 N = the number of measurements of distance taken in the observed sample
 A = a geographical area of the study

Hence the ratio of the observed mean distance (rA) to this expected value (rE) is termed as the nearest neighbor statistic (R). By using the said formula and " R_n " scale as mentioned in Table 1 the nearest or " R " values have been found out for the study area as a whole and tahsil level to study the nature of pattern of rural settlements.

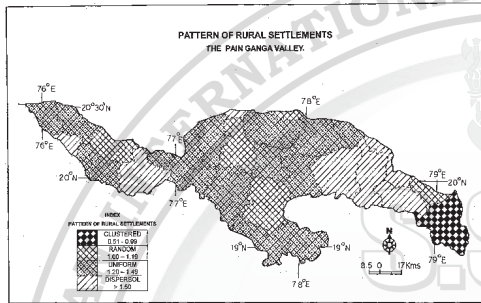
Table No. 1
RN - Scale

RN Scale	Nature of Pattern Rural Settlements
0.< - 0.50	High - concentration
0.51 - 0.99	Cultured pattern
1.00 - 1.19	Random pattern
1.20 - 1.49	Uniform pattern
> - 1.50	Dispersal pattern

As the first stage, a simple random sample of 840 rural settlements out of the total 2208 rural settlements, has been chosen randomly from the all rural settlements, and computed various indices as shown in Table No. 2. The Table No. 1 provides the statistic " R " value which is meaningful and precise expression of the distribution pattern of rural service centers. With the study area variation of distribution mainly would seem due to environmental, economic, base, transportation facilities and land occupancy. The value of " R " computed for all the tahsils vary form 0.95 to 1.88 showing cluster to the uniform distribution of rural settlements in the area under study. Dealing with " R " values of different sample area, the explanation follows as per different tahsils of measurements, considering the study area as a whole. The pattern of distribution shows the approaching uniform distribution of rural settlements. This is mainly due to regional development of economic, social and physical condition (Map No. 2) provided that the value of rE is significantly different form rA . Otherwise the pattern should be considered as uniform distribution.

Referring to the " R " values of the 28 tahsils, we can understand the pattern of distribution of rural settlements in all tahsils. Five tahsils namely Ner (1.13), Mahagaon (1.18), Wani (1.15), Mehakar (1.02), Manora (1.4) have the random distribution pattern, mainly due to physical and cultural features to rural development. The Painganga Valley direction has developed the random pattern because of the location of maximum rural settlements along the foothills, hill top zones and few small-sized tribal villages on the patches of the forest clearings on the hilly tract. Korapana (0.95) is the only tahsil where clustered pattern is found and it indicates the close spacing of distribution. This is mainly due to physical hindrance at other places for the development of rural settlements in the Painganga Valley. There are fourteen tahsils, which have the nature of uniform distribution. The reasons for this type of distribution are mainly due to the development of agriculture occupancy, rural service centers, cottage industrial expansion, and mode of transport facilities for their respective hinterland or catchment area and the remaining tahsils i.e., Yavatmal (1.60), Pusad (1.21), Darwha (1.28), Digras (1.20), Arni (1.42), Umardhed (1.20), Chikhali (1.27), Buldhana (1.19), Lonar (1.49), Sindkhed Raja (1.43), Malegaon (1.35), Washim (1.28), Mangrulpir (1.40) etc. The dispersed pattern is found in seven tahsils namely, Ghantaji (1.66), Kelapur (1.76),

Ralegaon (1.80), Zari-Jamani (1.88), Deulgaon Raja, Karanja, Risod, due to their geographical conditions. The maximum area of the southern part of the study area, being capped with the forest cover, also indicate dispersed pattern of rural settlements as a result of their relatively wide spacing and location in patches of the forest clearings in the Painganga Valley, (Map No. 2).



Map No. 2
Table No. 2

Distribution Pattern of Rural Settlements

Tahsil	No. of Rural Settlements	rA	rE	'R'	Nature of pattern
Ner	11	0.84	0.74	1.13	Random
Kalamb	14	1.69	1.09	1.46	Uniform
Yavatmal	32	1.75	1.32	1.32	Uniform
Darwha	44	1.56	1.21	1.28	Uniform
Digras	26	1.61	1.34	1.20	Uniform
Pusad	70	0.90	0.74	1.21	Uniform
Umarkhed	42	0.76	0.63	1.20	Uniform
Mahagaon	40	0.76	0.64	1.18	Random
Arni	38	0.87	0.61	1.42	Uniform
Ghatanji	39	1.2	0.72	1.66	Dispersion
Kelapur	41	1.04	0.59	1.76	Dispersion
Ralegaon	16	1.3	0.72	1.80	Dispersion
Moregaon	10	1.1	0.67	1.64	Dispersion
Z-Jamani	38	1.7	1.05	1.88	Dispersion
Wani	16	1.5	1.03	1.15	Random
Chikhali	28	0.78	0.61	1.27	Uniform
Buldhana	20	0.86	0.72	1.19	Uniform
D. Raja	8	1.04	0.63	1.65	Dispersion
S. Raja	12	1.03	0.72	1.43	Uniform
Lonar	11	0.82	0.55	1.49	Uniform
Mehkar	23	1.06	1.03	1.02	Random
Malegaon	15	1.22	0.90	1.35	Uniform
Mangrulpir	42	1.48	1.05	1.40	Dispersion
Karanja	12	1.30	0.74	1.75	Random
Manora	44	0.84	0.58	1.44	Uniform
Washim	53	1.04	0.51	1.28	Dispersion
Risod	35	1.12	0.72	1.55	Clustered
Korapana	60	1.21	1.05	0.95	Uniform
	840	32.34	21.83	1.48	Uniform

CONCLUSION-Physical homogeneity of the Painganga Valley has been mainly responsible for almost a uniform distribution pattern of rural settlements comprising different types. The features of distribution of rural settlements and their types and pattern in the Painganga Valley have been examined in detail, besides the general conditions in Vidarbha. The rural settlements density is found to be dependent on agricultural prosperity in the Painganga Valley. The distribution pattern of rural settlements is influenced by physical, cultural, economic, social and political factors in the study area. Physical homogeneity in the Painganga Valley has been mainly responsible for almost a uniform distribution pattern of rural settlements.

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