



SPATIAL PATTERN OF RURAL SETTLEMENTS IN BIDAR DISTRICT

Dr. Chaya B. Phadke

**Teaching Assistant, Department of studies in Geography,
Karnataka University Dharwad.**

ABSTRACT:

Study of the distributional pattern of settlements and growth centres is one of the important aspects in rural settlement Geography. Before entering in to the process of planning one should know how the population and settlements and how the services and facilities are distributed. What type of relationship amongst these distributional patterns exists, where the areal disparities exists and so on so forth. Conceptually, the development of the growth centres cannot be at random if one centre is linked with the other spatially and functionally. Therefore, it is necessary to study the distributional patterns at the time of planning for the development of Taluk. For this purpose, the researcher has applied the nearest neighbour methodology to analyse the distributional pattern of settlements.



In the present paper the researcher has made an attempt to analyse the spatial pattern of rural settlements in Bidar District of Karnataka State. The main objective is to examine the way rural settlements are distributed using the Nearest Neighbour Analysis Technique in respect of Bidar District. All the four-order rural settlement show a random spatial pattern. Generally, random distribution occurs there where there is no pattern at all. The random pattern of rural settlement in Bidar district is mainly the result of locational advantages in terms of availability of natural resources at specific points. The main resources responsible for the emergence of settlements in Bidar district includes limited cultivable form land and availability of water for agricultural, etc. Geographically the district extends over an area of 5448 sq.km. with a total population as per as 2022 is 19,27,828, consisting of 604 rural settlements and 5 urban centres.

KEYWORDS: *Spatial, Growth points, Service centres, key settlements.*

INTRODUCTION:

Geographers consider rural settlement as man-made habitat the rural landscape, based on primary occupations such as agricultural, forestry, mining, fishing, hunting etc. which flourish on local resource. They examine the settlement teaches such as building and their architectural styles, roads and lanes, in order to distinguish new categories and patterns and determine their functional relationships. Thus, the size, spacing, form and functions of rural settlements and their origin are essentials of the subject matter. Their regional variations are mostly dependent on the sequential growth of their morphology and the social and economic structure of the society they represent and serve.

The term distribution refers to the way in which human settlement are spread over the landscape. The pattern maybe one of isolated homes, each separated by great distance, or the pattern maybe clustered random, regular. There are various factors and conditions responsible for different types of rural settlements. There are physical features–nature of terrain, attitude, climate and availability of water, cultural and ethnic factors, social structured, caste and religion and security factors–defense against thefts and robberies. Once formed, settlements may continue for centuries, long after the original advantages of the site have become irrelevant. However, it is extremely unlikely that the pattern of distribution of settlements will remain the same villages shrink and grow, some disappear completely whilst entirely new ones are recreated.

The pattern of settlement maybe easily identified by reading and observing a large-scale map, like that of the topographical maps prepared by the survey of India or the ordnance Survey of Britain. The settlements have different shapes according to the topography and terrain of the site and the patterns of roads and streets. The shape or pattern of a settlement is usually influenced by its layout and functional morphology. The settlements are broadly classified into the following shapes or patterns. 1.Linear settlement, 2. Rectangular settlement, 3. Circular settlement, 4. Square settlement, 5. Semi-circular settlement, 6. Triangular settlement, 7. Oval settlement, 8. Radial settlement, 9. Star like settlement, 10. Amorphous settlement.

More than 60 percent of the world population lives in rural settlements and most of the people inhabit in settlements of rectangular pattern. Rectangular settlements mainly develop in productive alluvial plains and wide intermountain valleys. The lanes in the rectangular settlements are almost straight, meeting each other at right angles. The rural settlements of Sutlej-Ganga plains, especially those which developed on the crossroads, fall in this category (Majid Hussain, 1991). The well-planned settlements of Germany, Malaysia, Israel and France also fall under this category.

Linear pattern is the other most important design of settlements. In the linear settlements houses are arranged along either side of a road, railway line, river or canal. Such settlements also evolve along the edge of a valley, especially in the mountainous area above flood level or along with coast.

STUDY AREA:

Geographically the district is located in the northern most portion and forms the tip the state. It lies between 17° 38` to 18° 25` north latitudes and 76° 42` to 77° 39` east longitudes. The district is bounded by Maharashtra state in the north and in the south by Gulbarga district(Karnataka State) and by Andra Pradesh in the east and by Maharashtra state in west. The district spreads over an area of 5448 Sq.Km. The districts total population as per as 2022 is 19,27,828.The district consists of five talukas and includes a total of 604 settlements, out of which 599 are rural settlements and remaining five are urban centers. The climate of this district is characterized by general dryness throughout the year except during the southwest Monsoon season.

Methodology and Data Base

Settlement often appears on maps as dots. Dot distributions are commonly used in geography. Sometimes patterns are obvious such as when settlements are extremely nucleated or dispersed. As in reality, the pattern is likely to lie between these two extremes and then any description will be subjective. One way in which a pattern can be measured objectively is by using nearest neighbour analysis. In the present study, in order to find out the rural settlements pattern, the nearest neighbour (Rn Scale) technique has been applied.

This technique was devised by a botanist who wished to describe pattern of plant distributions. It can be used to identify a tendency towards nucleation or dispersions of settlements, shops, industry etc.

The formula used in nearest neighbour analysis is measures the extent to which a particular pattern is clustered, random or regular.

- Clustering occurs when all dots are very close to the same point. In an extreme case, Rn would be 0.
- Random distributions occur where there is no pattern at all Rn then equal 1.0. The usual pattern of settlement is one which is predominantly random with a tendency either towards clustering or regularity.
- Regular patterns are perfectly uniform. If ever found in reality, they would have an Rn value of 2.15 which would mean that each dot (settlement) is equidistant from all its neighbours.

Using nearest neighbour analysis formula.

$$Rn = 2\bar{d} \sqrt{\frac{n}{A}}$$

Rn – the description of the distribution

D – The mean distance between the neighbours(kms)

N – The number of points(Settlements) in the study area

A – The area under study

Spatial Pattern of Rural Settlements

The settlement pattern is characterized by small clusters of houses and rich fertile soil and irrigated agriculture land i.e., scattered houses in relation to its geographical size and also the number of villages. Bidar district has relatively large number of (5) urban centres, most of these towns are large in population size. There are more in the nature of marketing and service centers than industrial centers.

SPATIAL PATTERN OF GROWTH POINTS:

There are 17 growth points in the entire Bidar District. Rn Value is 1.18(see table-1). It indicates random like distribution pattern. Thus, the growth points pattern in the district is random.

Table -1 Bidar District - Growth Points - Nearest Neighbour Statistics

S.No.	Nearest neighbour settlements		Distance in Km
1	1	2	16.50
2	2	3	6.00
3	3	2	6.00
4	4	3	11.00
5	5	6	16.50
6	6	7	11.00
7	7	8	10.50
8	8	9	4.50
9	9	8	4.50
10	10	11	6.00
11	11	10	6.00
12	12	13	12.5
13	13	11	12.00
14	14	15	15.5
15	15	13	15.00
16	16	17	12.5
17	17	16	12.5
	Total		178.50

$$\bar{d} = \frac{178.50}{17} = 10.5$$

Area = 5458

$$Rn = 2\bar{d} \sqrt{\frac{n}{A}}$$

$$Rn = 2 \times 10.5 \sqrt{\frac{17}{5458}}$$

$$Rn = 21 \sqrt{0.0031}$$

$$Rn = 21 \times 0.056$$

$$Rn = 1.18 \text{ Random Pattern}$$

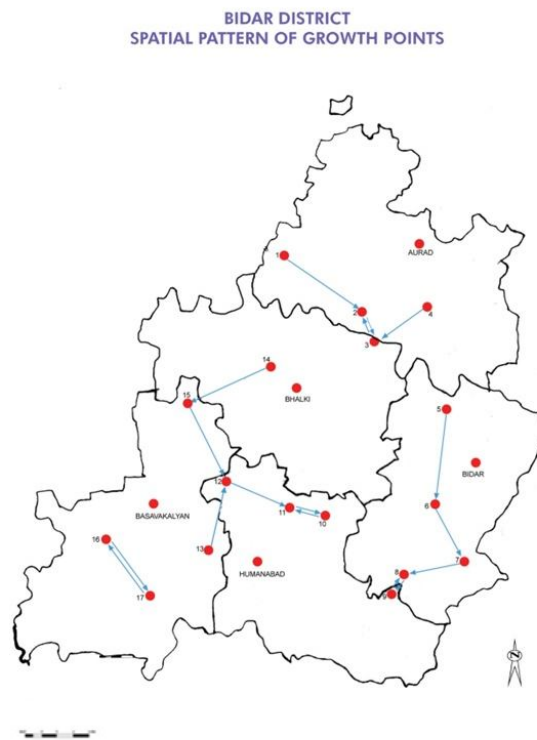


Fig-1

SPATIAL PATTERN OF SERVICE CENTRES:

There are 24 service centres in Bidar district and Rn value is 1.35 Random pattern(see table 2). It indicates random like distribution pattern. Thus, the service centres are in randomly distributed in the district.

Table -2 Bidar District - Service Centres - Nearest Neighbour Statistics

SL. No.	Nearest neighbour settlements		Distance in Km
1	1	2	9.00
2	2	3	5.00
3	3	2	5.00
4	3	4	8.00
5	5	7	4.50
6	6	5	18.50
7	7	5	4.50
8	8	9	7.00
9	9	8	7.00
10	10	9	9.50
11	11	12	11.00
12	12	13	3.00
13	13	12	3.00
14	14	13	39.00
15	15	16	10.00
16	16	15	10.00
17	17	18	13.50
18	18	17	13.50
19	19	18	22.00
20	20	21	10.50
21	21	20	10.50
22	22	23	9.00
23	23	24	6.00
24	24	23	6.00
	Total		245.00

$$\bar{d} = \frac{245.0}{24} = 10.21$$

$$\text{Area} = 5458$$

$$Rn = 2\bar{d} \sqrt{\frac{n}{A}}$$

$$Rn = 2 \times 10.21 \sqrt{\frac{24}{5458}}$$

$$Rn = 20.4 \sqrt{0.0044}$$

$$Rn = 20.4 \times 0.066$$

$$Rn = 1.35 \text{ Random Pattern}$$

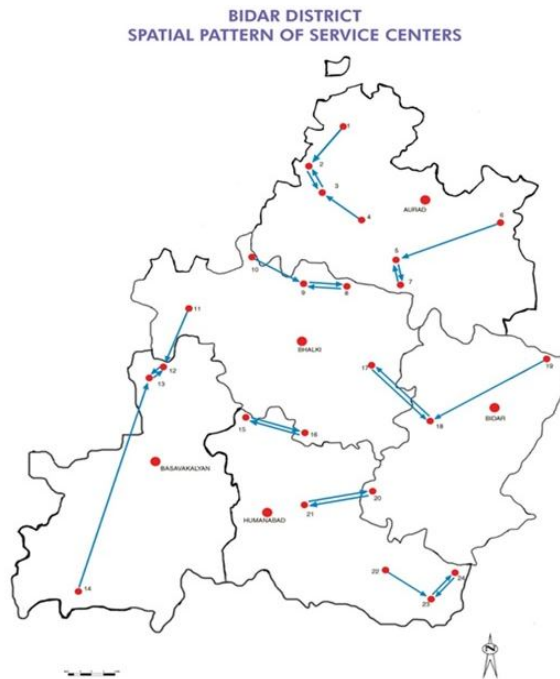


Fig. 2

SPATIAL PATTERN OF KEY SETTLEMENTS:

There are 61 key settlements in the entire Bidar District and are found more or less in groups forming random pattern of key settlements. The R_n Value for the key settlements is 1.07 indicating a random type of pattern. It is indicated in table-3.

Table-3 Bidar District - Key Settlements - Nearest Neighbour Statistics

SL. No.	Nearest neighbour settlements		Distance in Km
1	1	2	2.00
2	2	1	2.00
3	3	4	8.50
4	4	5	4.00
5	5	4	4.00
6	6	7	8.00
7	7	5	5.50
8	8	7	7.50
9	9	7	8.50
10	10	11	6.00
11	11	10	6.00
12	12	13	5.00
13	13	14	1.50
14	14	13	1.50
15	15	14	4.00
16	16	17	4.00

17	17	16	4.00
18	18	19	7.00
19	19	18	7.00
20	20	18	8.50
21	21	22	6.50
22	22	21	6.50
23	23	24	6.50
24	24	25	6.00
25	25	24	6.00
26	26	27	3.00
27	27	26	3.00
28	28	31	3.50
29	29	28	4.00
30	30	29	6.50
31	31	28	3.50
32	32	33	5.00
33	33	32	5.00
34	34	35	7.00
35	35	34	7.00
36	36	37	3.50
37	37	36	3.50
38	38	39	3.50
39	39	38	3.50
40	40	39	10.50
41	41	39	4.50
42	42	41	5.50
43	43	44	5.50
44	44	43	5.50
45	45	46	3.50
46	46	45	3.50
47	47	48	2.50
48	48	49	2.50
49	49	48	2.50
50	50	51	5.00
51	51	48	3.50
52	52	53	6.50
53	53	54	6.50
54	54	53	6.50
55	55	56	3.50
56	56	54	3.00
57	57	56	6.00
58	58	57	9.50
59	59	60	5.00
60	60	59	5.00
61	61	60	6.00
		Total	309.50

$$\bar{d} = \frac{309.50}{61} = 5.07$$

Area = 5458

$$Rn = 2\bar{d} \sqrt{\frac{n}{A}}$$

$$Rn = 2 \times 5.07 \sqrt{\frac{61}{5458}}$$

$$Rn = 10.15 \sqrt{0.011}$$

$$Rn = 10.15 \times 0.11$$

Rn = 1.07 Random Pattern

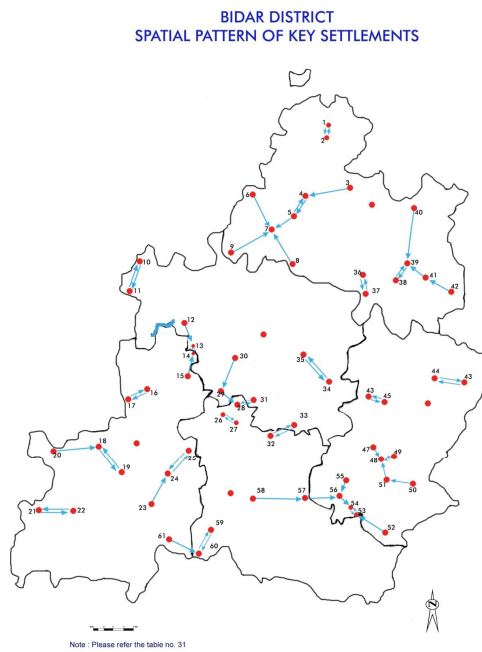


Fig-3

SPATIAL PATTERN OF DEPENDENT VILLAGES:

There are 497 dependent villages in the entire district of Bidar. All five talukas Rn value is different (Aurad 1.35, Basavakalyan 1.58, Bhalki 1.57, Bidar 1.20, Humanabad 1.50). It shows a random like distribution pattern. Thus the dependent villages are randomly distributed in the district.

CONCLUSION

The Bidar district represents four hierarchical order of rural settlements viz. Growth Centres, Service Centres, Key Settlements and Dependent Villages. The Nearest Neighbor Analysis technique measures the distances between each point and the closest point to it, and then compares these too expected values for a random sample of points from a complete spatial randomness. All the four order rural settlements show a random spatial pattern. Generally, random distributions occur where there is

no pattern at all. The random pattern of rural settlements in Bidar district is mainly the result of locational advantages in terms of availability of natural resources at specific points. Main resources responsible for the emergence of settlements in Bidar district includes limited cultivable farmland and availability of water for agriculture, etc.

REFERENCES:

1. Clark, P. J. and Erans (1954): "Distance to Nearest Neighbour as a Measure of Spatial Relationships in Populations Ecology," Vol. 35, pp. 453-455.
2. Kulkarni A. R. (1983): "A Geographical Analysis of Rural Settlement in Belgaum District". Unpublished Ph.D. Thesis, Dharwad Karnatak University.
3. Mandal R. B. (1981): "Planned Development of Rural Settlements". New Delhi Concept Publishing Company.
4. Mukherjee A.B. (1969): "Spacing of Rural Settlements in Andhra Pradesh A Spatial Interpretations". Geographical Outlook, Vol. 6, pp. -> 1-19.
5. Singh K. N. (1975): "An Approach to the Study of Morphology of Indian Villages". Reading in Rural Settlement Geography, NGSI, Varanasi.
6. Ahmad, E. (1962): "Rural settlements Types in U.P," A.A.A.G.42(3). PP.253-76.
7. Jordan, T. G. (1975) "On the Nature of Settlements Geography," Reprinted in Rural settlement Geography (Eds.) Singh K.L. National Geographical society of India, Varnasi P.14.
8. K. V. Sundaram, (1978): "Some recent Trends in Regional Development planning in India in Regional Planning and National Development" Misra R. P. et. al.
9. Ansarkar R.M: "An Integrated Development of Solapur District (Maharashtra)."
10. Azad, R.N. (1987) "Planning process for Integrated Rural Development: A simplistic Approach (Edi)," S.R. Subramanim and committee 'Readings in Integrated Rural Development, Oxford and IBH Publication corporation Pvt. Ltd., New Delhi.