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Analyzing Rural Settlement Size Trends: A Comparative Study of Nashik District from 1991 to 2011

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Abstract:
The size and distribution of rural settlements are crucial elements in geographical studies, particularly in Rural Settlement Geography. Understanding these factors helps clarify the settlement system. Key criteria for assessing rural settlement size include population, population density, settlement area, and the number of houses. The paper focuses on identifying the size of rural settlements within the study region. It aims to evaluate the factors that influence the spatial characteristics of these settlements across different tehsils, examining how size affect the spatial organization of rural areas.

Key Words: Settlement Size, Population Density, Spatial Characteristics, Spatial Organization

Introduction:

The differences in the size of rural settlements across various areas result from variations in ecological conditions (Mandal, 1978). Scholars and researchers employ a range of mathematical models and techniques to analyse this aspect of rural settlements.

According to Singh (1998), settlement size reflects factors such as soil quality, topography, and the socio-economic background of the local cultural group. In this study, the size of rural settlements is analysed in relation to the rural population of the region. It is observed that there is a distinct correlation between the size of rural settlements and the population within those areas.

Study area:

For this study, Nashik district has been chosen as the area of focus due to its unique characteristics. This region features a distinct physical landscape and diverse socioeconomic conditions. Located in the north western part of Maharashtra State, Nashik encompasses parts of the upper Godavari and Girana basins. It is situated between 19˚33' and 20˚53' north latitude and 73˚15' and 75˚16' east longitude (Nashik Gazetteer, 1983). The district spans portions of Survey of India degree sheets like 46H, 46L, 47E, and 47I. Positioned on the leeward side of the Western Ghats, Nashik is a relatively well-developed and densely populated area of Maharashtra, excluding its tribal belt. The district covers an area of 15,530 square kilometers and includes 1,922 rural settlements.

Objectives:

- To assess the size of rural settlements affected by population, population density, and settlement area.
- To examine the factors that contribute to the variation in the size of rural settlements, from small to large.

Database:

Required data have been collected from the secondary sources. Tehsil wise data concerned with rural settlements and population have been obtained from Nashik district census handbook, 2011 and google earth and GIS software.

Methodology:

The data collected for the present investigation are tabulated and analyzed. Rural settlements according to population size have been calculated. These data have been represented with the help of choropleth method.

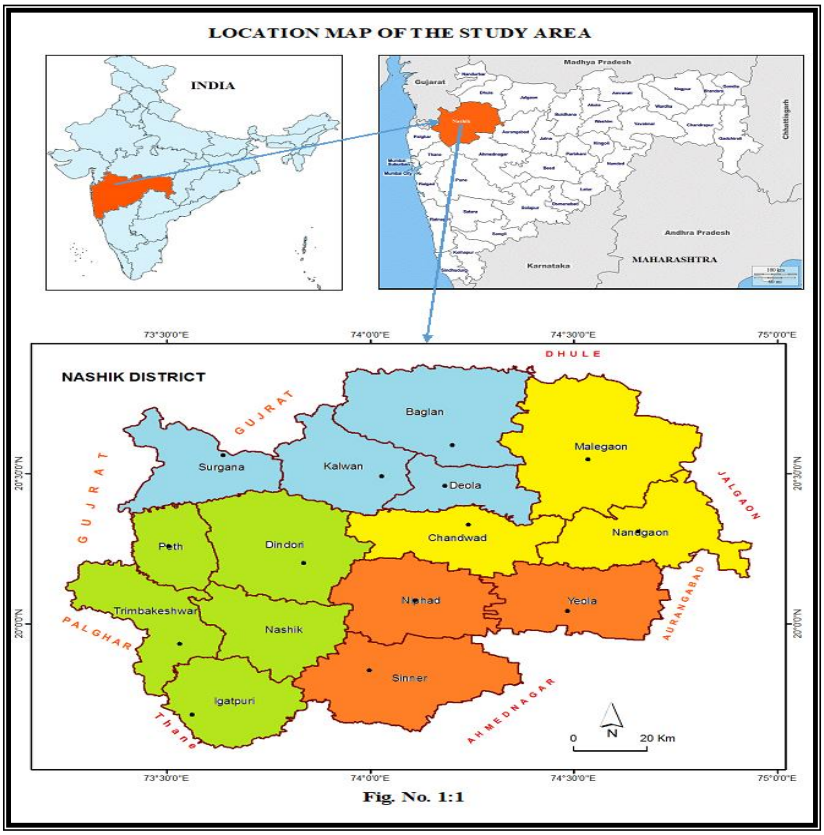


Fig. No. 1:1

Result and Discussion:

The rural population of the study region is categorized into five groups, with each group interval set at 500. Table I:2 shows the population sizes for these groups. The average size of rural settlements is calculated using the following formula:

$$S = P/N$$

where:

- S represents the average size of the rural settlements,
- P is the rural population of the tehsil,
- N is the number of rural settlements in the tehsil.

This method is applied across all 15 tehsils in the study region. Details on the size of the rural population in different groups for the decades of 1991, 2001, and 2011 are provided in Table I:1.

Table No. I:1
Size of Rural Settlement Population Index (1991 to 2011)

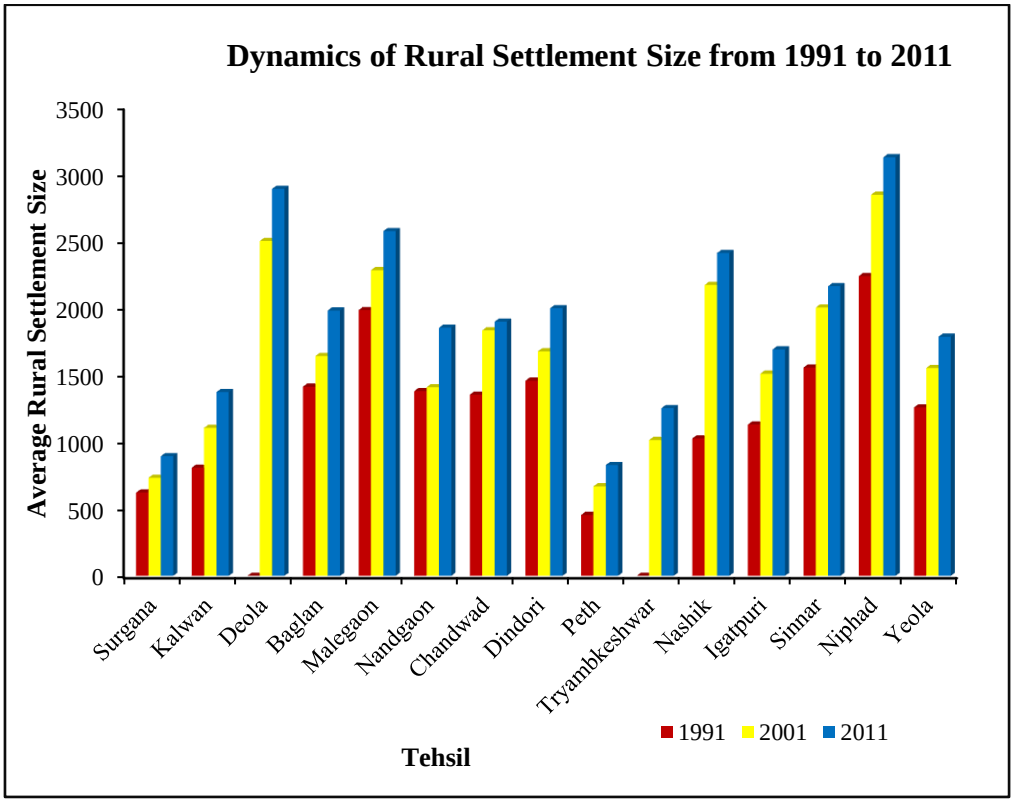
Sr. No	Tehsil	1991	2001	2011
1	Surgana	621.20	731.52	892.38
2	Kalwan	806.61	1104.06	1370.80
3	Deola	NA	2499.77	2890.44
4	Baglan	1411.69	1640.20	1980.79
5	Malegaon	1983.86	2282.03	2574.38
6	Nandgaon	1378.74	1407.23	1851.86
7	Chandwad	1351.86	1832.04	1896.47
8	Dindori	1456.15	1675.49	1998.16
9	Peth	454.37	667.41	826.47
10	Tryambkeshwar	NA	1012.90	1250.94
11	Nashik	1025.24	2171.59	2410.25
12	Igatpuri	1128.61	1508.23	1689.62
13	Sinnar	1554.59	2003.42	2162.24
14	Niphad	2238.25	2845.94	3125.77
15	Yeola	1256.16	1550.92	1784.84
	Total	**1365.38**	**1584.36**	**1826.13**

Source: Compiled by a researcher

Table No. I:2 Population Size Groups

Groups	Population Size
Very Low	< 500
Low	501 to 1000
Medium	1001 to 1500
High	1501 to 2000
Very High	> 2000

Source: Compiled by a researcher



Graph No. 1:1

The bar graph 1:1, spanning from 1991 to 2011, offers insights into the settlement sizes across various tehsils, reflecting broader geographical and developmental trends. **Niphad** and **Malegaon** showed the highest growth rates, which may be indicative of more substantial economic or infrastructural development in these areas. Niphad, in particular, has shown the highest increase, reflecting perhaps the most significant changes over the period.

Deola and **Tryambkeshwar** limiting direct comparisons. However, the substantial increases observed from 2001 to 2011 suggest positive growth trends in these regions as well. **Peth** and **Surgana** showed more modest increases compared to other tehsils. The slower growth rate might be attributed to different regional development strategies or slower economic changes. **Baglan** and **Chandwad** also exhibited steady growth, reflecting relatively stable development.

The average increase across all tehsils suggests an overall positive trend, with a noticeable increase in the average value over time. The data, maps and graph suggest that geographic factors such as proximity to major cities, industrial zones, or natural resources play a role in the settlement sizes.

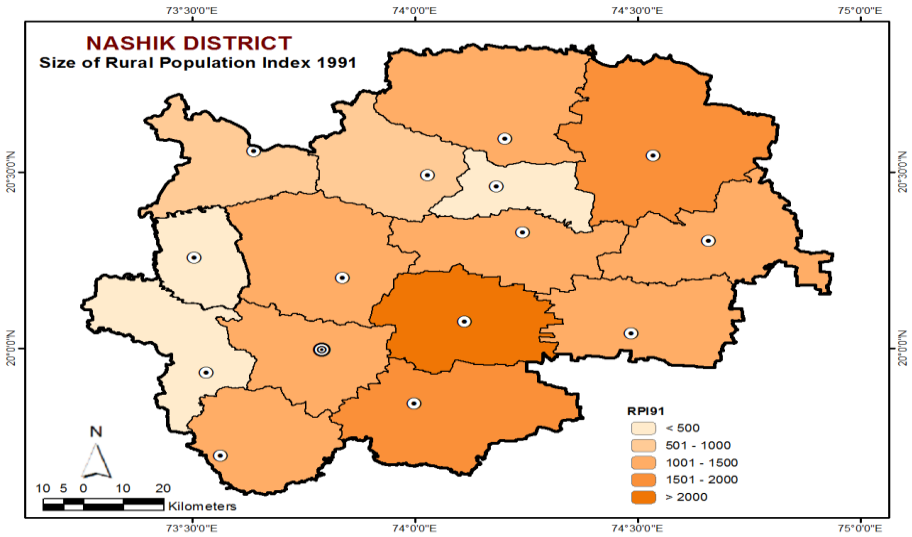


Fig. No. 1:1

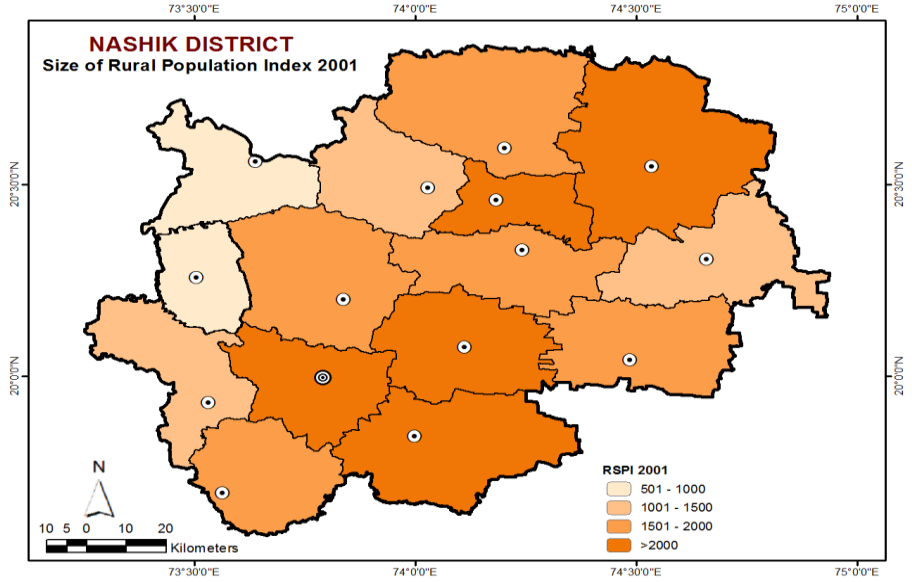


Fig. No. 1:2

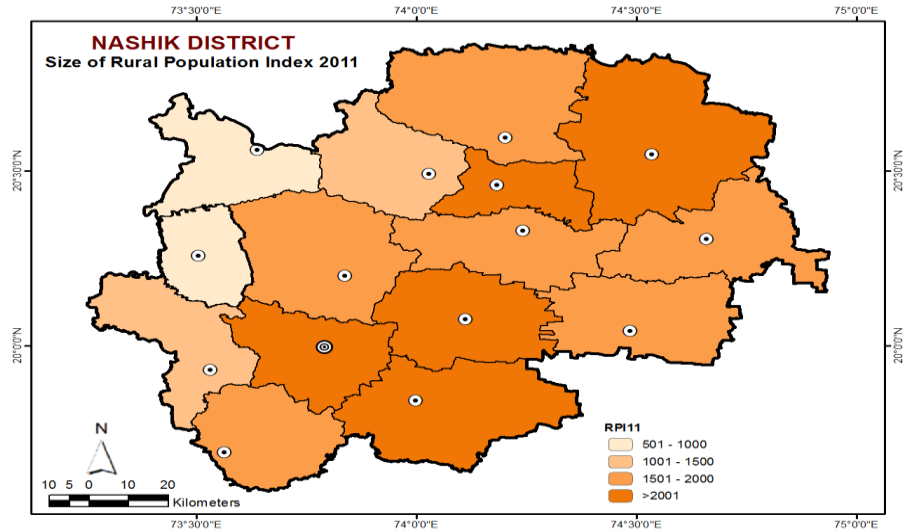


Fig. No. 1:3

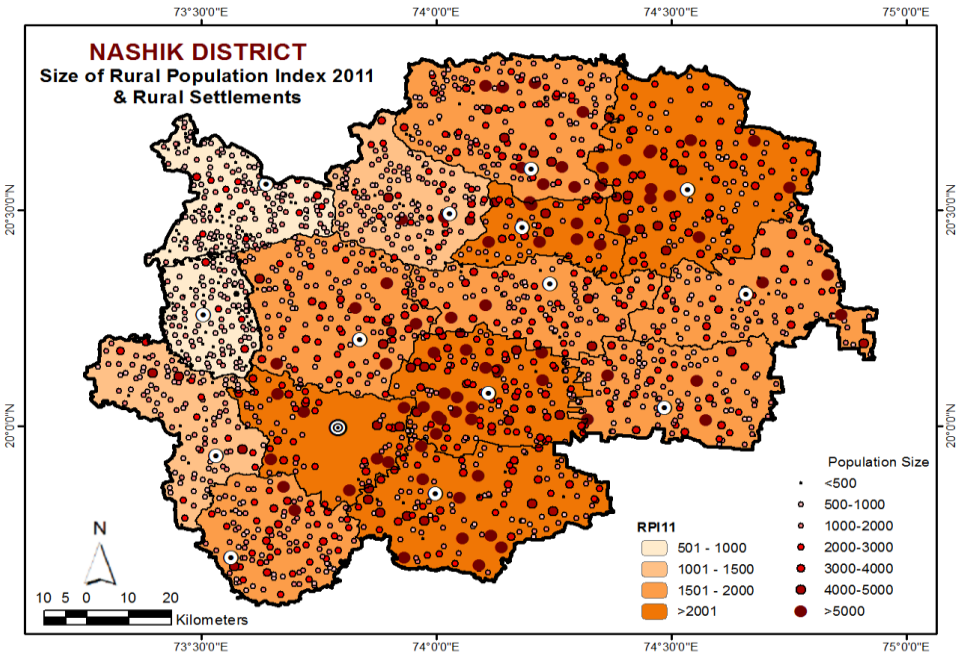


Fig. No. 1:4

Group Wise Result:

Very Low Size (Below 500)

In 1991, Peth tehsil was the only area in the study region with a very low size of rural settlements, characterized by populations below 500. This tehsil, located in the western part of the region, has consistently shown this low settlement size from 1991 to 2011. The low population density can be attributed to the challenging topography, shallow coarse soils, and a lack of urban centers.

Low Size (501 to 1000)

Rural settlements with populations ranging from 501 to 1000 were observed in Surgana and Kalwan tehsils in 1991. By 2001 and 2011, this size category was noted in Surgana and Peth tehsils. Contributing factors include the northern mountainous region, heavy rainfall, limited transportation and communication infrastructure, and insufficient cultivable land.

Medium Size (1001 to 1500)

In 1991, the tehsils of Baglan, Nandgaon, Chandwad, Dindori, Nashik, Igatpuri, and Yeola exhibited medium-sized rural populations, falling between 1001 and 1500. By 2001, Kalwan, Nandgaon, and Tryambkeshwar showed this medium size, with Kalwan and Tryambkeshwar continuing in 2011. The trend indicates a decline in medium-sized populations in these areas, influenced by irrigation facilities and market centers. A few medium-sized settlements are found in drought-prone regions.

Large Size (1501 to 2000)

In 1991, Malegaon, Sinnar, and Niphad tehsils were categorized as having large rural settlements, with populations between 1501 and 2000. By 2001 and 2011, this category expanded to include Baglan, Chandwad, Dindori, Igatpuri, Yeola, and Nandgaon tehsils. The increase in settlement size in Malegaon, Sinnar, and Niphad is attributed to improved transportation and irrigation facilities, increased land under cultivation, and the presence of urban centers.

Very Large Size (Above 2000)

Rural settlements with populations exceeding 2000 were observed in 2001 and 2011 in Deola, Malegaon, Nashik, Sinnar, and Niphad tehsils. These areas benefit from well-developed road networks, urbanized settlements, and effective irrigation systems through canals and rivers. Their flat topography and advanced agricultural practices have facilitated the growth of very large rural settlements, with market centers emerging nearby.

Conclusion:

In conclusion, the distribution and size of rural settlements across the study region reflect "**diverse geographical and socio-economic factors**". The observation and analysis highlight significant geographical disparities in settlement size growth. In 1991, Peth tehsil had a very low settlement size due to its challenging topography and lack of urban infrastructure. Low-sized settlements were seen in Surgana and Kalwan, influenced by mountainous terrain and inadequate infrastructure. Medium-sized settlements were prevalent in several tehsils in 1991 but showed a declining trend by 2001 and 2011, largely due to changes in irrigation and market accessibility. Large settlements in Malegaon, Sinnar, and Niphad expanded over the years, benefiting from improved infrastructure and urbanization. By 2001 and 2011, very large settlements emerged in Deola, Malegaon, Nashik, Sinnar, and Niphad, driven by advanced

irrigation, better transportation, and favourable topography.

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