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Spatial Relationship between Levels of Development and Distribution of Central Places in Parbhani District, Maharashtra

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Abstract

The spatial distribution and functional hierarchy of central places are closely associated with the level of regional development. This study examines the spatial relationship between levels of development and the distribution of central places in Parbhani District, Maharashtra. A Composite Index of Development (CID) was constructed using selected socio-economic and infrastructural indicators, including population characteristics, availability of transport facilities, institutional infrastructure, and service amenities. Based on the composite index values, the tahsils of the district were classified into four categories, namely high, moderate, low, and very low levels of development. The distribution, size, and functional significance of central places were then analyzed in relation to these development categories using spatial analytical techniques. The results reveal a strong correspondence between higher levels of development and the presence of fewer but larger and functionally diversified central places. In contrast, tahsils with lower levels of development are characterized by a higher number of smaller, lower-order central places, reflecting fragmented service provision and limited accessibility. Very low development areas exhibit restricted central place formation due to inadequate infrastructure and weak institutional support. The study highlights the decisive role of regional development, particularly transport connectivity and institutional facilities, in shaping settlement hierarchy and spatial organization. The findings provide valuable insights for regional planning and policy formulation aimed at achieving balanced and sustainable settlement development.

Keywords: Central Places, Regional Development, Spatial Analysis, Settlement Hierarchy, Parbhani District

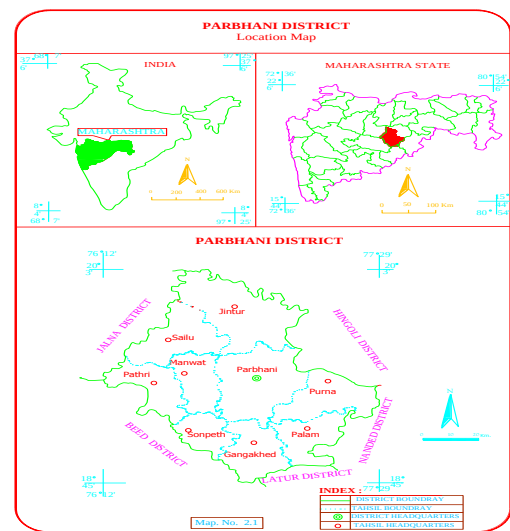
Introduction

Central place theory provides a framework for understanding the spatial organization of settlements and service centers within a region. According to this theory, the size, number, and spacing of central places depend on population density, economic activity, transport networks, and the level of regional development. In developing regions, variations in socio-economic conditions often lead to an uneven distribution of central places.

Parbhani District in Maharashtra presents a suitable case for examining the relationship between regional development and the distribution of central places. The district exhibits marked inter-tahsil variations in infrastructure, agricultural development, urbanization, and service facilities. The present study seeks to analyze how these variations influence the number, size, and spatial arrangement of central places within the district.

Study Area

Parbhani District is located in the eastern part of the Marathwada region of Maharashtra and consists of nine tahsils—Parbhani, Gangakhed, Palam, Sonpeth, Purna, Pathri, Manwat, Sailu, and Jintur. The district is predominantly agrarian, though the degree of irrigation, urbanization, and infrastructural development varies widely among tahsils. These differences have a direct bearing on the spatial distribution of central places and service centers across the district.



Objectives of the Study

The present study aims to:

1. Examine the spatial distribution of central places in Parbhani District.
2. Analyze the relationship between levels of development and the distribution of central places.
3. Identify variations in the size and concentration of central places across different development levels.
4. Assess the influence of socio-economic and infrastructural factors on settlement hierarchy.

Data Sources and Methodology

1. Data Sources

The study is based on secondary data obtained from Census of India publications, District Statistical Abstracts, socio-economic reviews of Parbhani District, and administrative records. Information on the number and distribution of central places was collected from district gazetteers and field-based secondary sources.

2. Methodology

The methodology involves two major steps:

1. **Assessment of Levels of Development:** A Composite Index of Development (CID) was used to classify tahsils into four development categories—high, moderate, low, and very low—based on selected socio-economic and infrastructural indicators.
2. **Spatial Analysis of Central Places:** The number, size, and spatial concentration of central places were analyzed in relation to the development categories. Tahsil-wise distribution of central places was compared with their respective development levels to identify spatial patterns and relationships.

Tahsilwise Distribution of Central Places

Sr. No.	Tahsil	Area in sq.km.	No. of Settlements R+U=T	No. of Central places R+U=T	No. of Settlements per 100sq.km	No. of Central Places per 100 sq. km.
1	Parbhani	1113	128+1=129	16+1=17	11.59	1.52
2	Gangakhed	635	105+1=106	07+1=08	16.69	1.26
3	Palam	561	81+0=81	6+00=06	14.44	1.07
4	Sonpeth	383	57+1=58	05+1=06	15.14	1.56
5	Purna	730	92+1=93	07+1=08	12.74	1.09
6	Pathri	592	56+1=57	06+1=7	9.63	1.18
7	Manwat	487	54+1=55	04+1=05	11.30	1.02
8	Sailu	753	93+1=94	04+1=05	12.48	0.66
9	Jintur	1257	164+1=165	14+1=15	13.12	1.19
	District	6511	830+8=838	69+8=77	12.87	1.18

R = Rural, U= Urban, T = Total.

Source: - District Census Handbook Parbhani District -2001

Levels of Development and Central Places

Based on the composite index values, Parbhani tahsil falls under the high level of development, while Palam represents a very low level of development. The remaining tahsils are categorized as moderate or low development areas. This classification provides the basis for analyzing the spatial distribution of central places across different development levels.

Composite Index of Development

Sr. No.	Tahsil	CDI	CID	Classification
1	Parbhani	1853.49	123.56	High
2	Gangakhed	1228.79	081.92	Low
3	Palam	1103.93	073.60	Very low
4	Sonpeth	1400.77	093.38	Moderate
5	Purna	1464.85	097.65	Moderate
6	Pathri	1419.23	094.61	Moderate
7	Manwat	1530.84	102.05	Moderate
8	Sailu	1413.17	094.21	Moderate
9	Jintur	1192.29	079.48	Low

Source: Compiled by the Author.

Spatial Analysis of Central Places

1. High Level of Development

Parbhani tahsil, characterized by a high level of development, contains a relatively smaller number of central places, but these centers are larger in size and provide a wide range of services. Higher urbanization, better transport connectivity, availability of banking and medical facilities, and a dense communication network contribute to the concentration of higher-order central places in this tahsil.

2. Moderate Levels of Development

The tahsils of Purna, Sonpeth, Pathri, Manwat, and Sailu fall under moderate levels of development. These tahsils contain a moderate number of central places, mostly of lower and middle order. The presence of cooperative institutions, moderate irrigation facilities, and improved transport infrastructure supports the development of service centers catering primarily to surrounding rural areas.

Low Levels of Development

Gangakhed and Jintur tahsils exhibit low levels of development but contain a relatively higher number of central places. These central places are generally small in size and offer limited services. The higher number of smaller centers reflects the need for dispersed service facilities in regions with inadequate transport connectivity and limited access to higher-order centers.

Very Low Level of Development

Palam tahsil represents a very low level of development and contains fewer central places. Poor transport infrastructure, inadequate irrigation facilities, and weak institutional support restrict the growth and expansion of central places in this area.

Relationship between Development and Central Places

The analysis reveals a clear relationship between levels of development and the distribution of central places. High and moderate development areas are characterized by fewer but larger and more functionally diversified central places. In contrast, low development areas exhibit a higher number of smaller central places, reflecting fragmented service provision and lower accessibility. Very low development areas show limited central place formation due to infrastructural constraints.

Findings

- A strong association exists between regional development levels and the spatial distribution of central places.
- Higher levels of development support the growth of larger, higher-order central places.
- Low development areas are characterized by a greater number of smaller, lower-order central places.
- Transport connectivity, irrigation facilities, and institutional infrastructure significantly influence settlement hierarchy.

Conclusion

The study confirms that levels of regional development play a decisive role in shaping the spatial organization of central places in Parbhani District. The observed patterns indicate a transition from dispersed, small service centers in low development areas to more concentrated and functionally advanced centers in high development areas. The findings emphasize the need for integrated regional planning aimed at improving infrastructure and institutional facilities in low and very low development tahsils to promote balanced settlement development.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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