

A ROLE OF MARKET CENTRES IN POPULATION DISTRIBUTION IN SOLAPUR DISTRICT: A GEOGRAPHICAL APPROACH

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Article Info	ABSTRACT
Article History: Received: 21st Sep 2025 Accepted: 06th Oct 2025 Published: 20th Oct 2025 Keywords: Market Centres, Population Distribution, Regional Development, Spearman's Rank Correlation, Solapur District.	Market centres are an important indicator of regional development as they enable agricultural producers, traders and consumers to interact for the exchange of goods, services and ideas. Apart from being local trade centres, market centres act as socio-economic hubs that balance the rural economy and influence the spatial organisation of settlements. Their growth and importance depend on factors such as road accessibility, transport connectivity, agricultural surplus, industrial linkages and population concentration. In India, which is a predominantly rural country, thousands of market centres support agricultural communities and guide regional development. Maharashtra, with Mumbai as the national financial capital, highlights the hierarchical importance of market centres, while in western Maharashtra, Solapur district stands out as a key region where market centres play a crucial role in shaping the distribution of settlements. The present study focuses on Solapur district, which has 316 market centres unevenly distributed across eleven tehsils. The objective is to examine the relationship between the distribution of market centres and the human population of the district. Using secondary data from the District Census Handbook (2011) and the Socio-Economic Summary of Solapur (2019-20), the analysis was carried out with the help of cartographic techniques and statistical methods. In particular, Spearman's rank order correlation method was applied to assess the relationship between market centers and human population. The correlation value of $r = 0.22$ indicates a moderate positive relationship, which indicates that tehsils with more market centers generally correspond to higher population concentrations, although urban and industrial factors also influence the settlement distribution. This study highlights that the hierarchy and distribution of market centers are important determinants of population distribution, as well as interacting with broader geographical and socio-economic forces to shape the regional development of Solapur district.

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INTRODUCTION

Market centres are a vital component of regional development and play a decisive role in shaping the spatial distribution of population. A market centre is not merely a place of exchange between farmers, retailers, and consumers; it is a local trade place that balances the rural economy and provides opportunities for social interaction. Accessibility, road connectivity, variety of shops, and the scale of trade determine the significance of each market centre. Concentration of agricultural and industrial products at these centres reflects the economic base of the surrounding region and attracts population clusters by generating employment and livelihood opportunities. India, being a predominantly rural country, has thousands of such market centres which sustain the agrarian economy and influence the settlement pattern. Maharashtra, with Mumbai as the nation's financial capital, also demonstrates the role of market centres in guiding economic and demographic trends. Within Maharashtra, Solapur district holds a prominent place due to its location in western Maharashtra and its dense network of 316 market centres. These centres supply fresh vegetables and other commodities to major markets across the state. Large and first-order market centres such as Solapur, Pandharpur, Mohol, Barshi, Akhuj, Sangola, Akkalkot, and Karmala serve as focal points of trade and population concentration. Thus, the distribution and hierarchy of market centres in Solapur district not only indicate the level of regional development but also highlight their role in influencing the spatial distribution of population.

STUDY AREA

Solapur district has been selected as the study area to examine the role of market centres in population distribution. The district is located in the southern part of Maharashtra, spread between 17°10' to 18°32' North latitude and 74°42' to 76°15' East longitude. It covers a geographical area of about 14,895 sq km and has an average elevation of about 500 m (1,640 ft) above sea level. According to the 2011 census, the district has a population of 43,17,756, with an average population density of 290 people per sq km and a sex ratio of 938 females per 1,000 males. The district has about 1,150 villages and three major urban centres, creating a mixed rural-urban landscape where the population distribution is strongly influenced by the accessibility of trade centres. In terms of climate, Solapur has a semi-arid, monsoon type climate. The average annual rainfall is about 570 mm, while the temperature ranges between 46°C in summer and 9°C in winter. The major rivers Bhima and Sina, although seasonal, are important in supporting the water needs of agriculture, industry and domestic use. These physical and climatic features directly affect agricultural productivity and in turn the growth of market centres. Economically, Solapur district is characterized by a dense network of 316 market centres, which act as trade and service centres for the rural and urban population. Of these, the number one market centres such as Solapur, Pandharpur, Mohol, Barshi, Akhuj, Sangola, Akkalkot and Karmala

dominate. These centres not only facilitate the exchange of agricultural produce and essential commodities but also attract population groups due to employment opportunities, transport links and socio-cultural interactions.

LOCATION MAP

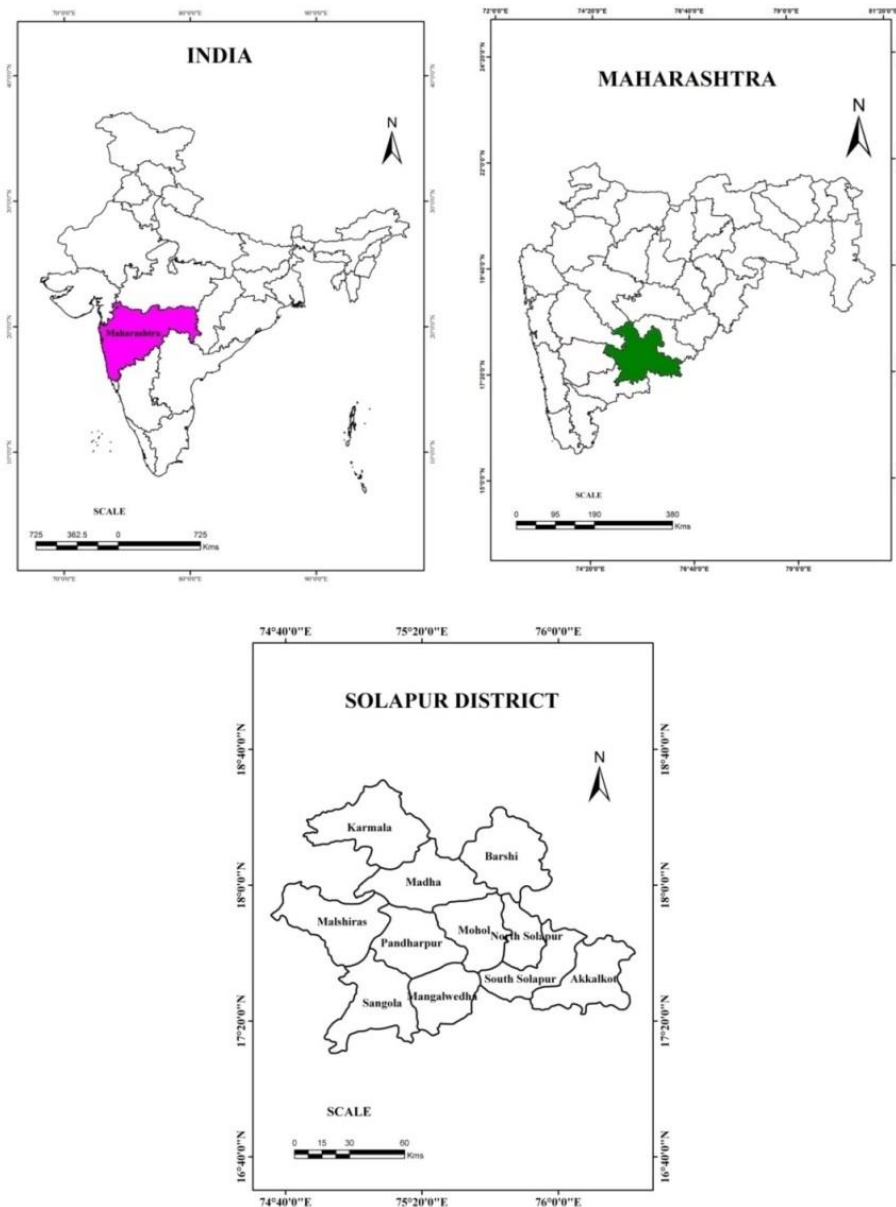


Fig. No. 1

OBJECTIVES

1. To map and analyze the spatial distribution of market centers in Solapur district, highlighting their hierarchy, accessibility, and functional role.
2. To examine the spatial pattern of human population distribution in both rural and urban areas of the district.
3. To explore the relationship between market centers and population concentration and how trade centers influence the growth of settlements.

DATABASE AND METHODOLOGY

The present study on “Role of Market Centres in Population Distribution of Solapur District: A Geographical Approach” is mainly based on secondary sources of information. Data regarding human population has been collected from the District Census Handbook of Solapur (2011), while information regarding the number, type and distribution of market centres has been obtained from the Solapur District Socio-Economic Summary (2019-20) and the Statistical Summary of Maharashtra. Additional references such as government reports, district gazettes and published literature were also consulted to support the analysis. To represent the spatial distribution, ArcGIS 10.5 software was used to generate thematic maps showing the location and concentration of market centres and human population in the district. For the purpose of comparison, the tehsils of Solapur district were classified into three categories namely high, medium and low based on simple statistical methods for both market centres as well as population density. To establish the relationship between these two variables, Spearman's rank order correlation method

Formula:-

Rank Order Spearman's Method

$$r = 1 - \frac{\sigma \sum d^2}{n^2 - N}$$

where r is the rank correlation coefficient, d is the difference between the ranks of the two variables, and N is the number of observations. The calculated results were then interpreted to understand the degree of correlation between the hierarchy of market centers and the spatial distribution of population in Solapur district.

SPATIAL DISTRIBUTION OF MARKET CENTRES IN SOLAPUR DISTRICT

In Solapur district, a total of 316 market centres have been recorded, spread across all the tehsils but their spatial distribution is uneven (Table 1). At the tehsil level, there is a notable variation in their number, ranging from 15 market centres in North Solapur to 53 market centres in Malshiras (Figure 2). This uneven pattern is not accidental but reflects the combined effect of geographical conditions, agricultural productivity, irrigation facilities, road connectivity and population concentration. Areas like Malshiras, Pandharpur and Sangola have emerged as major centres due to their fertile soil, surplus agricultural production and good accessibility, while regions like North Solapur and Mangalwedha are weak in terms of market development due to limited agricultural surplus and scattered settlement patterns.

TABLE NO. 1
SOLAPUR DISTRICT: DISTRIBUTION OF MARKET CENTRES (2011)

Sr. No.	Name of Tahsil	Market Centres (No.)	Percentage (%)	Rank	Category
1	Akkalkot	21	6.65	8	Low
2	Barshi	21	6.65	8	Low
3	Karmala	23	7.28	7	Moderate
4	Madha	27	8.54	6	Moderate
5	Malshiras	53	16.77	1	High
6	Mangalwedha	18	5.70	10	Low
7	Mohol	29	9.18	5	Moderate
8	North Solapur	15	4.75	11	Low
9	Pandharpur	49	15.51	2	High
10	Sangola	35	11.08	3	High
11	South Solapur	25	7.91	4	Moderate
Total	District	316	100.00	—	—

Source: District Census Handbook (2011)

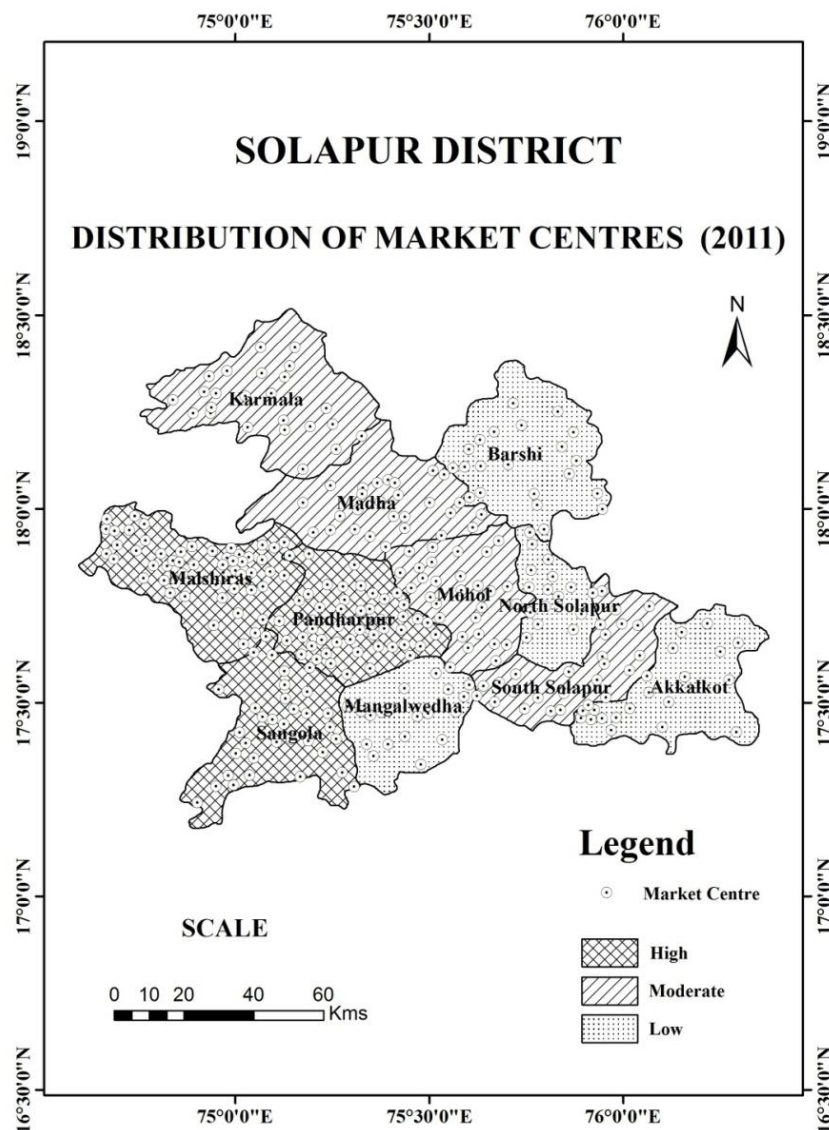


Fig. No. 2

The tehsil-wise distribution of 316 market centres in Solapur district is clearly uneven and shows where the population clustered. The upper-tier tehsils – Malshiras (53; 16.77%), Pandharpur (49; 15.51%) and Sangola (35; 11.08%) – account for 43.36% of all market centres, creating powerful trade-service magnets that support continuous migration through dense settlement corridors and employment, input-output linkages and service availability. The middle group – Mohol (29; 9.18%), Madha (27; 8.54%), South Solapur (25; 7.91%) and Karmala (23; 7.28%) – add another 32.91%, creating secondary centres that stabilize the surrounding rural population and provide periodic flows to higher nodes. In contrast, the low-population cluster – Akkalkot (21; 6.65%), Barshi (21; 6.65%), Mangalwedha (18; 5.70%) and North Solapur (15; 4.75%) – together account for only 23.75% of the centres, indicating weaker trade intensity and more dispersed settlements; notably, North Solapur is an outlier where urban-administrative flows contribute a higher share of population despite fewer market centres. Overall, the table shows a clear core-periphery structure: tehsils with large market-centre endowments (top five centres share 61.08%) tend to coincide with zones of higher population concentration (e.g., Malshiras, Pandharpur), while tehsils with sparse services have lower population shares – underscoring that market centres act as spatial anchors of population distribution, although urban priorities and administrative functions may reduce the strength of this relationship at the local level.

SPATIAL DISTRIBUTION OF HUMAN POPULATION IN SOLAPUR DISTRICT

As per the 2011 census, the total population of Solapur district is 43,17,756, but this population is unevenly distributed across the eleven tehsils of the district (Table 2). The population share in Mangalwedha ranges from 4.77 percent to 24.49 percent in North Solapur, highlighting a striking spatial imbalance. This variation in population distribution is closely linked to geographical location, irrigation facilities, agricultural productivity, industrial development and strength of market centres. Tehsils like North Solapur, Malshiras and Pandharpur, which have the highest population share, are also areas of fertile land, strong connectivity and vibrant market centres. On the other hand, tehsils like Mangalwedha, Karmala and South Solapur are sparsely populated, indicating limited irrigation, weak economic base and fewer market centres.

The 2011 tehsil-wise population profile of Solapur district shows a clearly uneven pattern that reflects the local attraction of major market centres and also reveals important exceptions. North Solapur is home to 24.49% of the district's population, reflecting a strong urban-administrative and industrial magnetism operating beyond the number of market centres. The other high-share tehsils - Malshiras (11.25%) and Pandharpur (10.25%) - closely match their high market-centre endowment, indicating that dense, well-connected trading centres help anchor larger, more compact settlement areas. The middle tier - Barshi (8.63%), Madha (7.50%),

Sangola (7.48%) and Akkalkot (7.29%) - shows a balance of rural-urban interaction where central market networks support stable, but not concentrated, population accumulation.

TABLE NO. 2
SOLAPUR DISTRICT: DISTRIBUTION OF HUMAN POPULATION (2011)

Sr. No.	Name of Circle	Total Population (No.)	Percentage (%)	Rank	Category
1	Karmala	2,54,489	5.89	10	Low
2	Madha	3,24,027	7.50	5	Moderate
3	Barshi	3,72,711	8.63	4	Moderate
4	North Solapur	10,57,352	24.49	1	High
5	Mohol	2,76,920	6.41	8	Low
6	Pandharpur	4,42,368	10.25	3	High
7	Malshiras	4,85,645	11.25	2	High
8	Sangola	3,22,845	7.48	6	Moderate
9	Mangalwedha	2,05,932	4.77	11	Low
10	South Solapur	2,60,897	6.04	9	Low
11	Akkalkot	3,14,570	7.29	7	Moderate
	District Total	43,17,756	100.00		

Source: District Census Handbook (2011). Rank computed on Percentage (descending). Categories: High > 10%; Moderate = 7–10%; Low < 7%.

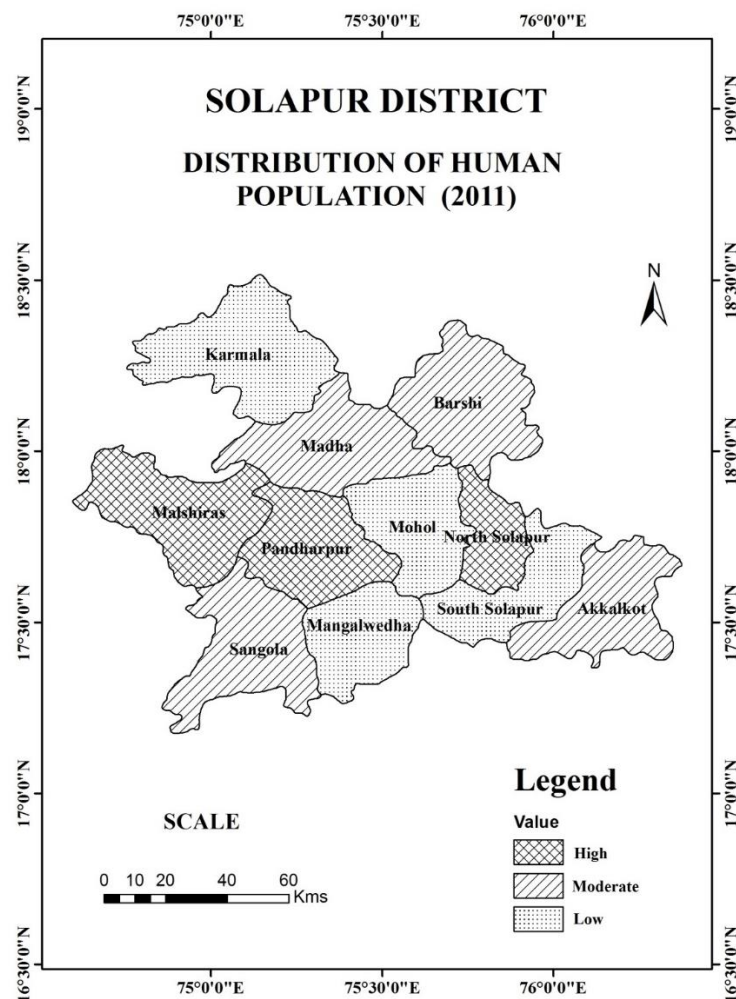


Fig. No. 3

In contrast, Mohol (6.41%), South Solapur (6.04%), Karmala (5.89%) and Mangalwedha (4.77%) form the low-share groups, which are consistent with low/low-level markets, weak irrigation and agro-linkages and more dispersed settlements. Overall, the table confirms the study's thesis: first-tier and well-networked market centres generally correspond to higher population concentrations, yet urban predominance (as in North Solapur) can increase the population share where the numerical number of market centres is low – implying that market hierarchy, connectivity quality and urban-industrial functions jointly shape Solapur's population distribution.

MARKET CENTRES AND HUMAN POPULATION DATA

The data on human population and market centres was compiled tahsil-wise for Solapur district (Table No. 3). The ranks were assigned based on percentage share, and deviations (d^2) were calculated to find the degree of correlation.

Table No. 3

The Market Centres and Human Population in Solapur District (2011)

Sr. No.	Name of Tahsil	Population (No.)	Population (%)	Rank	Market Centres (No.)	Market Centres (%)	Rank	d^2
1	Akkalkot	3,14,570	7.29	7	21	6.65	8	1
2	Barshi	3,72,711	8.63	4	21	6.65	9	25
3	Karmala	2,54,489	5.89	10	23	7.28	7	9
4	Madha	3,24,027	7.50	5	27	8.54	5	0
5	Malshiras	4,85,645	11.25	2	53	16.77	1	1
6	Mangalwedha	2,05,932	4.77	11	18	5.70	10	1
7	Mohol	2,76,920	6.41	8	29	9.18	4	16
8	North Solapur	10,57,352	24.49	1	15	4.75	11	100
9	Pandharpur	4,42,368	10.25	3	49	15.51	2	1
10	Sangola	3,22,845	7.48	6	35	11.08	3	9
11	South Solapur	2,60,897	6.04	9	25	7.91	6	9

Source: Compiled by Researcher

By applying the formula, the calculated correlation value is:

$$r = 1 - \frac{6(172)}{11(11^2 - 1)} = 0.22$$

This shows a **moderate positive correlation ($r = 0.22$)** between market centres and human population in Solapur district. The correlation value indicates that tahsils with more market centres generally correspond to higher population concentrations, but the relationship is not very strong. For example, **Malshiras and Pandharpur** show both high numbers of market

centres and large population shares, while **North Solapur** has the highest population but fewer market centres, reducing the overall correlation strength.

Several geographical and socio-economic factors explain this moderate correlation. Road connectivity, fertile soil, irrigation systems, and agricultural productivity enhance both market development and population growth. At the same time, industrialisation and urbanisation (as in North Solapur) attract population even without a high number of market centres. Hence, market centres act as **important but not the sole determinant** of population distribution in Solapur district.

KEY FACTS

- 1) This study analyses the role of market centres in shaping the population distribution of Solapur district in Maharashtra.
- 2) Solapur district covers 14,895 sq km between 17°10'–18°32' N latitude and 74°42'–76°15' E longitude and has an average elevation of 500 m.
- 3) As per the 2011 census, the total population is 43,17,756, with a density of 290 persons per sq km and a sex ratio of 938.
- 4) The district has 1,150 villages and 3 urban centres, which creates a mixed rural-urban landscape.
- 5) There are 316 market centres in the district, which show a wide but uneven distribution.
- 6) The high market centres are found at Malshiras (53), Pandharpur (49) and Sangola (35).
- 7) Mohol (29), Madha (27), South Solapur (25) and Karmala (23) have medium market centres.
- 8) Akkalkot (21), Barshi (21), Mangalwedha (18) and North Solapur (15) have low market centres.
- 9) North Solapur (24.49%), Malshiras (11.25%) and Pandharpur (10.25%) have high human population (>10%).
- 10) Medium human population (7-10%) is found in Barshi (8.63%), Madha (7.50%), Sangola (7.48%) and Akkalkot (7.29%).
- 11) Low human population (<7%) is recorded in Mohol (6.41%), South Solapur (6.04%), Karmala (5.89%) and Mangalwedha (4.77%).
- 12) The district has a semi-arid monsoon climate, with an average rainfall of 570 mm and a temperature range from 46°C in summer to 9°C in winter.
- 13) The Bhima and Sina rivers are seasonal but important for agriculture, industry and domestic water use.
- 14) Spearman's rank order correlation method was used in this study to examine the relationship between market centers and population distribution.
- 15) The results indicate that tehsils with more market centers correspond to higher population density, while fewer centers correspond to sparse settlements.

CONCLUSION

The present study highlights that market centres play a significant role in shaping the spatial distribution of population in Solapur district, though their influence is moderated by other geographical and socio-economic factors. The analysis shows that tahsils with a larger number of market centres, such as **Malshiras, Pandharpur, and Sangola**, also record higher population shares, reflecting the strong attraction of well-connected trade hubs that provide employment opportunities, service facilities, and socio-economic interaction. Conversely, tahsils like **Mangalwedha, Karmala, and South Solapur**, with fewer market centres, show lower population densities, indicating the limited impact of weak trade networks on settlement concentration. However, the case of **North Solapur**, which holds the highest population share despite having relatively few market centres, demonstrates that urbanisation, industrialisation, and administrative importance also act as powerful determinants of population distribution. The Spearman's Rank Order Correlation ($r = 0.22$) further confirms a **moderate positive relationship** between market centres and population, suggesting that while market centres serve as spatial anchors for settlement growth, the overall population distribution is shaped by a complex interplay of market hierarchy, urban functions, infrastructure, and natural resources. Thus, it can be concluded that market centres are essential nodes of regional development in Solapur district, but their role in population distribution must be understood within a broader geographical framework.

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