

Exploring Regional Economic Clustering in Maharashtra: Identifying Key MSME and Large Enterprise Clusters Across Six Major Districts

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Abstract

The report focuses on economic clustering in two segments - small and medium-sized enterprises (SMEs) and large enterprises - across Maharashtra. The main aim is to find out and evaluate the important clusters as per various economic parameters such as total workers, total units of economy and total working population. As per the findings of this study, the Konkan region is one major cluster because it consists of a large number of MSMEs. This specific region including Mumbai, Thane, Raigad, Ratnagiri, Sindhudurg, and Palghar contain a high concentration of micro, small and medium enterprises which are found to be contributing to local growth significantly. Conversely, the analysis reveals that five out of six districts excluding Amravati that are Nashik, Pune, Aurangabad, Nagpur, and Konkan show higher levels of clustering for large corporations. All these areas have many big industrial units thus signifying their role as key players in Maharashtra's economy. From here it can be deduced that there is much variation regionally when it comes to industry with particular districts hosting different types of businesses. Using a combination of quantitative data assessment methods, this study utilizes geographical distributions and concentrations of these economic entities alongside labor across counties which offer essential insights for policymakers on best practices.

1 Introduction

Indian economy heavily depends upon Micro, small and medium enterprises (MSMEs) that contribute approximately 30 percent to the GDP and provide jobs to more than 110 million people (MSME Annual Report, 2023). Their growth is important for economic stability, innovation, and social development.

The cluster system, which groups similar businesses in a specific area, is a strategic approach that enhances MSME capabilities. It provides collaboration opportunities, shares resources, promotes efficiency, and thus increases competitiveness (Kumar and Saini, 2022; Singh and Gupta, 2023). Clustering facilitates increased efficiency and innovation through knowledge sharing and specialized infrastructure (Chakraborty and Rao, 2021; Jha and Sharma, 2021).

Recent studies indicate that technological advancements have transformed clustering strategies over time (Sinha and Banerjee, 2023). A number of studies show that MSME clusters catalyze the growth and internationalization of businesses in sectors like textiles and electronics (Kumar and Rani, 2022; Sharma et al., 2022). On the contrary, challenges such as poor infrastructure and regulations may hinder effective clustering (Mehta and Kapoor, 2021).

Clustering has various advantages including better data analysis, simpler decision-making, improved productivity, and competitiveness. Factor analysis is vital for proper categorization of MSMEs and the right policy choices (Rao and Singh 2023). Clusters are “groups of companies or institutions that are located close to one another in a particular industry; they are connected by shared characteristics or complementary activities” as defined by Porter (2008). This report examines industrial clusters within six districts namely Konkan, Nashik, Pune, Aurangabad, Amravati and Nagpur located in Maharashtra with the intention of investigating their economic as well as industrial dynamics.

2 Objectives

- To identify the clusters of MSMEs in Maharashtra.
- To analyze the clusters of MSMEs in Maharashtra.
- To evaluate the significance of these clusters against various economic parameters.
- To identify clustering patterns for large enterprises.
- To compare clustering patterns for MSMEs and large enterprises in Maharashtra.

3 Theory

3.1 Cluster(s)

Porter (1990) probably contributed the most to the cluster concept, although he describes it as "a geographically proximate grouping of related companies and institutions that are linked by common interests, shared assets, and a backdrop that enables business growth and innovation."

According to Kaplinsky and Morris, 2019, a cluster is a group of economic agents operating in the same industry and residing close to each other, with intensive interaction among them. As mentioned by Derlukiewicz et al., 2020, clusters occur in a geographically limited area with common economic activities that are connected by different channels of interaction and are exposed to similar constraints and opportunities.

The concept of clusters has undergone an evolution from the early definition based primarily on proximity in terms of distance to factors that include social infrastructures, information flows, and partnerships. Modern usage of the term 'cluster' refers both to spatial concentration and functional arrangements which enhance business activities beyond simple geographical boundaries.

3.2 Role of Clusters in Development

MSME clusters in India have been evident as a catalyst of economic growth and competitiveness (Kumar et al., 2020). Humphrey and Schmitz (2002) assert that economic development can be

driven by clusters through collaboration, innovation and access to resources. Despite infrastructure deficits and regulatory constrictions, clusters could be a plus to MSME performance (Yigit Ozkan et al., 2020).

Several studies show that MSMEs in underdeveloped countries tend to operate within tightly knit social and production networks that hinder their integration and access to resources (Telizhenko et al., 2019). According to Kayvanfar et al. (2019), however, clusters facilitate both vertical and horizontal integration thus enhancing innovation and business interactions. In cluster settings, MSMEs experience increased competitiveness, improved managerial capabilities, as well as better efficiency levels (Kaplinsky and Morris, 2019).

Through clusters, MSMEs gain access to external knowledge which leads to better products and helps them collaborate with other organizations hence increasing their productivity levels and innovation skills (McPhillips, 2020). Generally, clusters offer a structured environment for collaboration among MSMEs as well as sharing of resources thus supporting development and growth (Idrissi et al., 2019).

3.3 Selection of State and Districts

This study has selected Maharashtra due to its diverse and vibrant industrial landscape, which provides a robust foundation for analyzing economic agglomeration. The six districts chosen for this study are Konkan, Nashik, Pune, Aurangabad, Amravati, and Nagpur. These districts were selected to represent a broad spectrum of industrial activities and to facilitate a comprehensive evaluation of economic trends and agglomeration patterns. Konkan, encompassing Mumbai, Thane, Raigad, Ratnagiri, Sindhudurg, and Palghar, is known for its concentration of MSMEs, particularly in textiles and manufacturing. Nashik is emerging as an industrial hub with a focus on automotive and food processing industries. Pune is a significant center for IT and manufacturing, recognized for its extensive industrial base. Aurangabad highlights a diverse manufacturing sector, with pharmaceuticals being a key industry. Amravati, while having potential for industrial growth, is relatively less developed compared to other regions. Nagpur serves as a major trade center and hosts a growing number of large businesses.

3.4 High Potential Industries in Maharashtra

Maharashtra boasts of a myriad of industries with high potential in different sectors across the state. In the mechanical sector, they have auto parts, precise engineering fine items like those used for machinery; things related to defense systems; railway stores; and oil refinery appliances (still under development). Also, there exist jigs as well as fixtures, tooling and dies, precision meteorological devices beside general engineering things. The cast iron and steel industries consist chiefly of machinery parts for casting or forging plus welding electrodes. Among those classified as electric gizmos, we find transformers generator sets control panels powerhouse devices household electrical fittings types. Among them, computerized hardware's digitalized gadgets telecommunication constituents, and portable defense technic-makers found within electronics are outstanding sorts themselves. The drugs and all products within that category which include bulk chemicals oils paints toilets soap detergents are included in this sector. Textile products such as yarn sizing and warping weaving dyeing printing etc., plus ready-made garments are found within the textiles/garments sector while food and beverages consist of packed foods ready to eat products seasonings bottled waters and bakeries. The cold storage caters for agricultural commodities and fishery. The focus of the non-conventional renewable energy industries is on solar power, wind energy and solar-wind hybrid solutions. The pharmaceutical sector encompasses bulk drugs as well as pharma printing and labeling.

Regional potential industries across Maharashtra's districts are diverse.

Mumbai is a major center for catering and hotel industries, computer hardware, ready-made garments, tourism, food processing, herbal products, bakery products, offset printing, power-saving devices, and many other sectors.

Thane specializes in fabrication, soft drink concentrate, rice milling, textile auxiliaries, potato/banana wafers, and various other manufacturing activities.

Raigad focuses on food processing, horticulture, rice milling, bamboo work, wooden furniture, and tourism.

Ratnagiri is known for mango canning, fish flour, sodium silicate, mango chutney, and more. Sind-

hudurg excels in seafood processing, banana chips, cashew processing, and packaged foods.

Palghar is recognized for its industrial tools, fasteners, forgings, and plastic molding.

Nashik is distinguished by its grape wine production, high-precision engineering components, auto components, and pharmaceuticals.

Pune stands out for its engineering products, IT sector, automobile components, and biotechnology.

Aurangabad features pharmaceuticals, auto components, engineering products, and textiles.

Amravati is notable for food processing, textiles, agro products, and chemicals.

Nagpur hosts industrial machinery, engineering products, chemicals, pharmaceuticals, and textiles.

Source: Industrial State Profile of Maharashtra – 2016-17, MSME-DI, Mumbai

4 Methodology

The research relies on exploratory descriptive to assess the industrial clusters of chosen locations in Maharashtra. Using documentary information, the research aids in comprehending and outlining the industries in those areas.

During the **exploration phase** of this study, data available for industries, economic units and labor force features within the selected districts (Konkan, Nashik, Pune, Aurangabad, Amravati and Nagpur) are collected and examined. This stage concentrates on identifying fundamental industry directions as well as economic units geographical distribution.

In the **descriptive phase** of the study new quantitative data is collected to give a good overview of the industry dynamics in these regions. Thus it is about analyzing data such as industrial concentration, economic output or employment figures. The quantitative methods involve the use of statistical tools that bring out insights concerning the economic performance of industries and their clustering characteristics.

Integrating exploratory and descriptive research methodologies while attempting to understand comprehensively these industrial clusters constitute our main objective. This way allows us to analyze qualitatively how different sectors are spread across distinct areas their economic

impact and possible advantages.

5 Analysis

Data was collected from various sources including government reports, online databases, and industry statistics. Key parameters used in the analysis include:

- **T(i):** Total Workers in the MSME and Enterprises Industry of the state of Maharashtra.
- **T(s):** Total Workers in MSMEs/Enterprises of the chosen districts.
- **E(i):** Total Economic Units/Companies in MSMEs/Enterprises of Maharashtra.
- **E(s):** Total Economic Units in MSMEs/Enterprises within the chosen districts.
- **N:** Total Working Population of Maharashtra aged 15-64.
- **Cluster Coefficient, Industry Coefficient, Sector Coefficient:** Metrics used to evaluate cluster significance

5.1 Figure 1: Districts considered for Study

5.2 Figure 2: Datasets and Notes

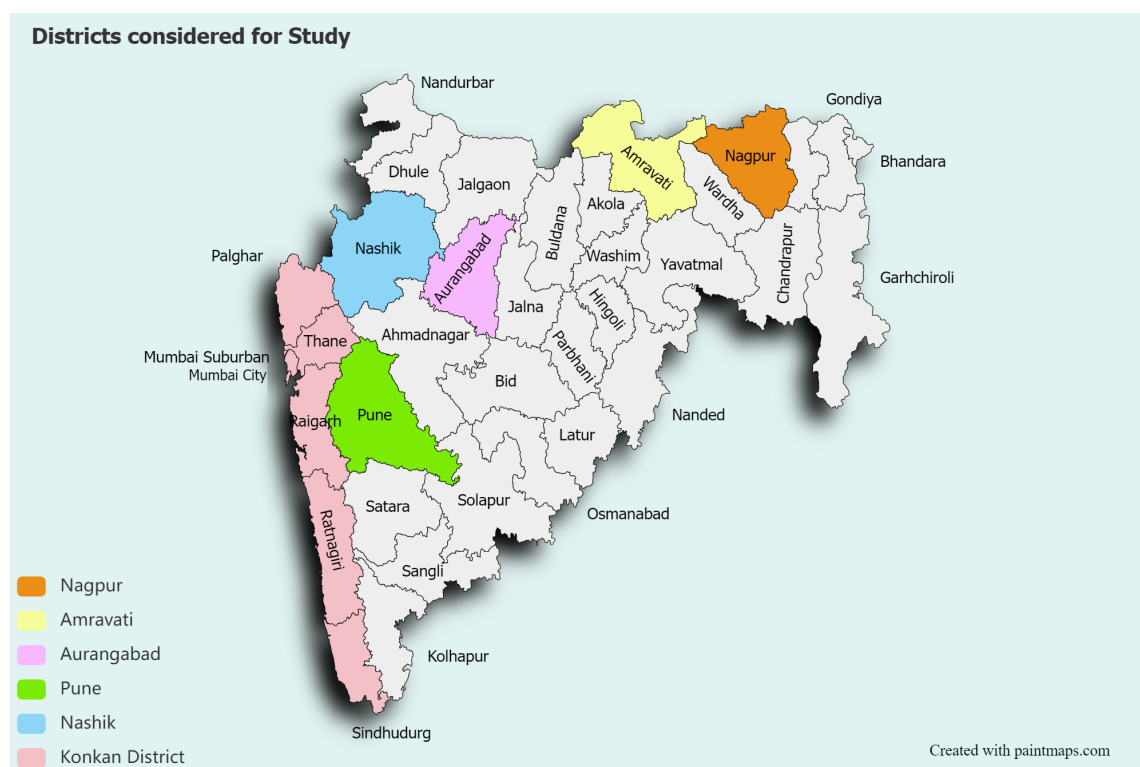


Figure 1: Map of Maharashtra with selected districts for analysis.

A	B	C	D	E	F	G	H	I	J	K	L	M
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DATASETS WITH NOTES						Selected indicators of industries based on ASI 2013-14						
		MSME		Large Enterprises		Pop. MH 112,373,333 (as per 2011 population Census)						
S.No	District	Total MSMEs	Employment in lakhs	Large Enterprises	Employment in Lakhs	Industrial State Profile of Maharashtra – 2016-17						
1	Konkan	39269	632000	1533	292000	a) No. of Enterprises Nos. 243721						
2	Nashik	27458	315000	665	152000	b) Employment Nos. 2919526(approx)						
3	Pune	92233	1004000	1490	407000							
4	Aurangabad	18751	192000	538	111000							
5	Amravati	14510	113000	148	32000							
6	Nagpur	26714	256000	541	131000							
7	Maharashtra	243721	2919000	4915	1125000							

Upto September, 2015, in all 2,43,721 MSME units, with an investment of Rs.56,552 crore generating employment of 29.19 lakh were functioning.

Redgionwise details of MSMEs and large industries upto 31.12.2012

Figure 2: Datasets and notes used for analysis.

*Source : Directorate of Industries GOM. *as on 31.12.2012*

6 Results

Data analysis was conducted using Excel to determine clustering patterns based on various economic parameters. The following figures illustrate the clustering results and the analysis process.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1						MSME Sector Cluster Evaluation							
2													
3	District	T _s	T _i	N	E _s	E _i	K _c	H _i	H _s	Cluster	TTS/TTI	UES/UEI	TTI/PTE
4	Konkan	6,32,000	29,19,526	11,23,73,333	39,269	2,43,721	8.33	11.98	16.09	VERDADERO	21.65%	16.11%	2.60%
5	Nashik	3,15,000	29,19,526	11,23,73,333	27,458	2,43,721	4.15	11.98	11.47	FALSO	10.79%	11.27%	2.60%
6	Pune	10,04,000	29,19,526	11,23,73,333	92,233	2,43,721	13.24	11.98	10.89	FALSO	34.39%	37.84%	2.60%
7	Aurangabad	1,92,000	29,19,526	11,23,73,333	18,751	2,43,721	2.53	11.98	10.24	FALSO	6.58%	7.69%	2.60%
8	Amravati	1,13,000	29,19,526	11,23,73,333	14,510	2,43,721	1.49	11.98	7.79	FALSO	3.87%	5.95%	2.60%
9	Nagpur	2,56,000	29,19,526	11,23,73,333	26,714	2,43,721	3.38	11.98	9.58	FALSO	8.77%	10.96%	2.60%
10										10			
11													
12						Large Enterprises Cluster Evaluation							
13	District	T _s	T _i	N	E _s	E _i	K _c	H _i	H _s	Cluster	TTS/T	UES/UEI	TTI/PT
14	Konkan	2,92,000	29,19,526	11,23,73,333	1,533	2,43,721	3.85	11.98	190.48	VERDADERO	10.00%	0.63%	2.60%
15	Nashik	1,52,000	29,19,526	11,23,73,333	665	2,43,721	2.00	11.98	228.57	VERDADERO	5.21%	0.27%	2.60%
16	Pune	4,07,000	29,19,526	11,23,73,333	1,490	2,43,721	5.37	11.98	273.15	VERDADERO	13.94%	0.61%	2.60%
17	Aurangabad	1,11,000	29,19,526	11,23,73,333	538	2,43,721	1.46	11.98	206.32	VERDADERO	3.80%	0.22%	2.60%
18	Amravati	32,000	29,19,526	11,23,73,333	148	2,43,721	0.42	11.98	216.22	FALSO	1.10%	0.06%	2.60%
19	Nagpur	1,31,000	29,19,526	11,23,73,333	541	2,43,721	1.73	11.98	242.14	VERDADERO	4.49%	0.22%	2.60%
20													
21		Variables.			Ts = Total de trabajadores del SECTOR						Ts = Total workers in the SECTOR		
22		E ε	Epsilon		Ti = Total de trabajadores en la INDUSTRIA						Ti = Total number of workers in INDUSTRIA		
23		H η	Eta		N = Total de personas por MUNICIPIO en edad de trabajar (15 - 64 años)						N = Total number of people of working age per MUNICIPALITY (15 - 64 years)		
24		I ι	Iota		Es = Total de Unidades Económicas del SECTOR						Es = Total Economic Units of the SECTOR		
25		N ν	Ni		Ei = Total de Unidades Económicas en la INDUSTRIA						Ei = Total Economic Units in INDUSTRIA		
26		T τ	Tau		Kc = Coeficiente de Cluster						Kc = Cluster Coefficient		
27		K κ	Kappa		Hi = Coeficiente de la INDUSTRIA						Hi = INDUSTRY coefficient		
28					Hs = Coeficiente del SECTOR								
29													
30													
31													

Figure 3: Analysis and results from Excel computations.

6.1 MSME Clusters

Konkan District: Konkan district is regarded as an important MSME cluster. This implies that there exists a density of small and medium enterprises in this area. For instance, TTS/TTI (21.65%) and UES/UEI (16.11%) depict the dominance of MSMEs in Konkan. Moreover, Kc value is 8.33 and Hi value is 11.98, which support the findings regarding clustering, thereby indicating a strong network of local units exhibiting MSME characteristics in Konkan.

6.2 Large Enterprise Clusters

Significant Clusters: Konkan, Nashik, Pune, Aurangabad, and Nagpur have been identified as significant clusters for large enterprises. The clustering coefficients are high in these locations as well

as TTS/TTI ratios; for instance, Konkan: 10.00%, Pune: 13.94%. In addition to these indicators, Kc values are notably elevated, suggesting the presence of heavily weighted multiplicative effects from economies of scale arising from having larger organizations.

6.3 A Notable Exception

Amravati does not make up a notable cluster for large enterprises due to its lower Kc value (0.42) and TTS/TTI ratio (1.10%). This implies that there are fewer concentrations of large firms compared to other localities around the River Godavari basin area within these states under consideration where it is situated.

6.4 Comparative Insights:

Pune is a preferred clustering place for larger business firms as shown by its Kc value of 5.37 and TTS – TTI ratio of 13.94 percent. However, it seems to lack MSME clusters which indicate that it has more big enterprises than Small and Medium-sized Enterprises (SMEs).

Aurangabad and Nagpur are also notable for their Kc values of 1.46 and 1.73 respectively suggesting significant clustering in the same vein. The decreased TTS/TTI and UES/UEI for MSMEs imply that such zones seldom concentrate on small and medium firms.

6.5 Figure 4: Map indicating Regional clusters for MSMEs

6.6 Figure 5: Map indicating Regional clusters for Large Enterprises

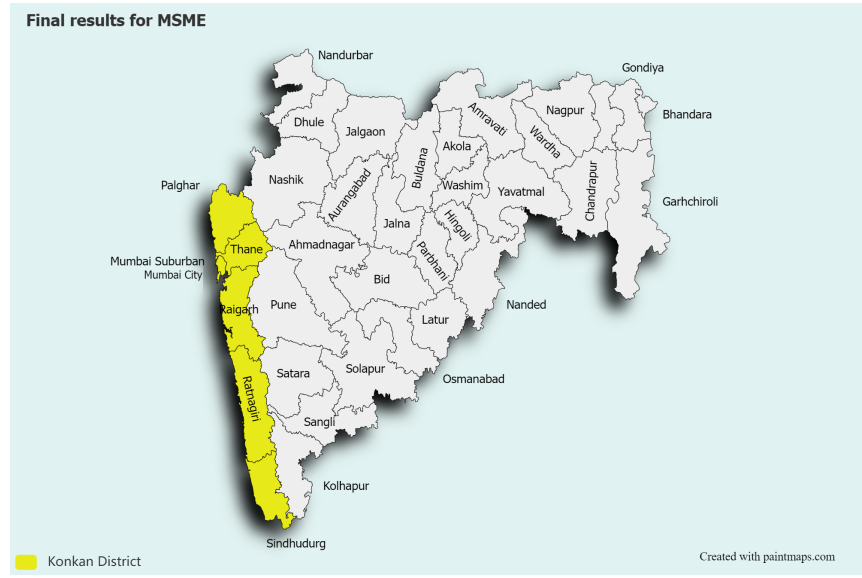


Figure 4: Map showing significant MSME clusters in Maharashtra.

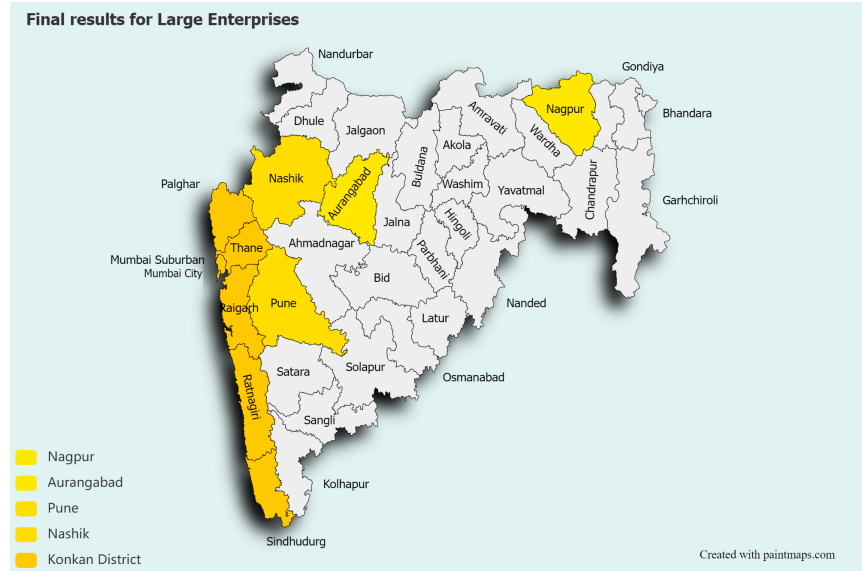


Figure 5: Map showing significant large enterprise clusters in Maharashtra.

7 Conclusion

This research notes that MSMEs and large firms in Maharashtra show pronounced clustering tendencies. There is a peculiar MSME cluster in the form of Konkan whose small and medium firms

are extremely concentrated in that area while on the other hand Konkan, Nashik Pune Aurangabad as well as Nagpur are major centres of large scale industries within this state.

This points out to the need for highly focused investments and growth strategies which vary with diverse regions. The significance of Konkan as an MSME centre suggests that the region has opportunities for implementing policies to support small or medium enterprises through improved infrastructure. In terms of larger firm clusters, initiatives should aim at sustaining growth and resolving possible challenges on infrastructure and regulation.

In summary the analysis is also helpful for policy makers, investors and business executives to identify where they can invest on the basis of their regional clustering map thus promoting balanced socio-economic development in these locations.

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