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SPATIAL DISTRIBUTION AND GROWTH OF INDUSTRIAL CLUSTERS IN HARYANA (1966-2016)

Dr. Gulshan Kumar

Assistant Professor of Geography, Govt. College, Hisar

Abstract

The study examines the spatial distribution and growth of industrial clusters in Haryana from 1966 to 2016, tracing their historical evolution, sectoral diversification, and regional imbalances. Drawing upon secondary data from government reports, industrial surveys, and scholarly literature, the research analyses the determinants of cluster growth, including geographical proximity to the National Capital Region (NCR), infrastructural development, state policy, entrepreneurial culture, and global linkages. The findings reveal that while districts adjoining the NCR—such as Gurgaon, Faridabad, and Sonipat—emerged as dominant industrial hubs integrated into global supply chains, traditional clusters in Panipat and Ambala maintained their prominence through artisanal traditions and export orientation. However, western districts such as Hisar, Bhiwani, and Mahendragarh lagged behind, highlighting uneven regional development. The study concludes that Haryana's industrial transformation was marked by both opportunities of agglomeration economies and challenges of spatial inequality, environmental stress, and policy-induced imbalances. The insights contribute to understanding cluster-led industrialisation in a regional context and offer implications for balanced industrial policy.

Keywords: Haryana; Industrial Clusters; Spatial Distribution; Agglomeration Economies; Industrialisation; Regional Development; Economic Transformation; India.

Introduction

The formation of Haryana in 1966 marked a pivotal moment in the economic geography of north-western India. Created through the reorganisation of Punjab, Haryana inherited a predominantly agrarian economy but also a strategic advantage — close proximity to the national capital region (NCR), access to major transport corridors, and large tracts of cultivable and non-cultivable land suitable for industrial and urban expansion. Over the next five decades (1966–2016) the state experienced a marked transformation: traditional agricultural landscapes progressively gave way to diversified industrial activity, the emergence of urban agglomerations, and the clustering of related firms in spatially concentrated pockets. This study traces that transformation by mapping the spatial distribution and growth dynamics of industrial clusters in Haryana between 1966 and 2016 (Saikia, 2016). Industrial clusters — geographically proximate groups of interconnected firms, suppliers, and associated institutions — matter because they generate agglomeration economies: knowledge spillovers, labour market pooling, specialized suppliers, and lower transaction costs. In Haryana these dynamics took distinct forms across time and space. Early decades saw the establishment of heavy and medium industries near legacy cities and along rail and road arteries. From the late 20th century, however, new patterns emerged: export-oriented and service-linked manufacturing around the NCR, petrochemical and textile concentrations in traditional industrial towns, and a rapid rise of small and medium enterprise (SME) clusters supported by local entrepreneurship and industrial estates. Understanding where clusters formed, how fast they expanded, and what structural factors underpinned

their growth is essential for both regional economic history and contemporary policy design (Ghani et al. 2016).

The study contributes to the literature on regional development and industrial geography in three ways. First, by covering a fifty-year window it captures long-run structural shifts rather than short-term fluctuations. Second, by mapping clusters at sub-district and district scales it reveals intra-state heterogeneity that state-level aggregates often hide. Third, by linking spatial patterns to policy interventions (land allotments, industrial estate development, transport upgrades) and to exogenous factors (proximity to Delhi, availability of skilled labour), the paper offers actionable insights for planners aiming to promote equitable and sustainable industrialisation. The remainder of the paper is organised as follows. The next section reviews key literature on industrial clustering and regional development, with emphasis on Indian and north-Indian contexts. This is followed by a description of data sources and the methodological framework used for spatial mapping and growth analysis. Subsequent sections present empirical findings on the location, sectoral composition, and temporal evolution of clusters, and analyse the drivers of growth using case examples of prominent cluster regions. The paper concludes with policy implications, limitations, and suggestions for future research.

The state of Haryana, carved out of Punjab in 1966, has witnessed a remarkable transformation in its economic landscape over the last five decades. Initially conceived as an agrarian state with fertile plains and a strong base in food production, Haryana has steadily evolved into one of the leading industrial and manufacturing hubs of India. This evolution has been shaped by its geographical proximity to the National Capital Region (NCR), its integration into national and international trade routes, and successive waves of industrial and urban development policies. The trajectory of Haryana's industrialisation is not uniform, however. It has been characterised by the uneven growth of industrial clusters, with some regions and sectors witnessing rapid development while others remain relatively underdeveloped. The period between 1966 and 2016 offers a crucial time frame for studying these dynamics, as it captures both the state's post-formation industrial initiatives and the subsequent restructuring of industries under liberalisation, globalisation, and market-driven forces.

Significance of the Study

The study of the spatial distribution and growth of industrial clusters in Haryana (1966–2016) is of great significance from both an academic and policy perspective. Industrial clusters are not only engines of economic growth but also indicators of structural transformation within a regional economy. By analysing the case of Haryana over a fifty-year period, this research provides valuable insights into the dynamics of industrial development in a state that has successfully transitioned from being predominantly agrarian to one of India's major industrial and manufacturing hubs. First, the study is important for understanding the historical trajectory of regional industrialisation. Haryana's industrial growth reflects different phases of India's economic development — the state-driven industrialisation of the 1960s–80s, the transitional reforms of the late 1980s, and the liberalisation-driven industrial expansion after 1991 (Kumar and Pattanaik, 2015). By mapping these transitions, the study highlights how policy regimes, infrastructure creation, and market integration shaped industrial clustering in different decades. Second, the research contributes to the understanding of spatial inequalities in industrial development. Industrialisation in Haryana has been highly uneven, with districts such as Gurgaon, Faridabad, Panipat, and Ambala emerging

as prominent clusters, while other regions remain relatively underdeveloped. Studying these spatial disparities provides important lessons on the relationship between geography, infrastructure, and industrial policy, thereby offering guidance for promoting more balanced regional development.

The study has practical significance for policy formulation and planning. Policymakers can draw on the findings to identify successful factors that led to the growth of dynamic clusters (e.g., automobile hubs in Gurgaon, textiles in Panipat, scientific instruments in Ambala) and replicate them in lagging regions. The insights can help in designing region-specific industrial policies, strengthening infrastructure, and attracting investments to underdeveloped districts, thereby ensuring equitable growth across the state. The research is significant for its contribution to the discourse on industrial clusters as engines of employment and entrepreneurship. Haryana's clusters have played a crucial role in generating jobs, stimulating small and medium enterprises (SMEs), and fostering innovation through inter-firm linkages. By examining their growth patterns, this study underscores the role of clusters in enhancing local skills, creating supply chain networks, and integrating regional industries into global value chains. The study offers a comparative perspective for scholars and practitioners interested in regional development (Chatterjee and Ganesh-Kumar, 2016). Haryana's experience demonstrates how proximity to metropolitan centres (Delhi-NCR), investment in infrastructure (roads, industrial estates, power supply), and targeted industrial policies can shape the geography of industries. These findings not only enrich the academic literature on industrial geography but also provide replicable lessons for other Indian states and developing countries aiming to promote cluster-based industrialisation. The significance of this study lies in its ability to link history, geography, and policy in explaining the evolution of industrial clusters in Haryana. It enhances academic understanding of regional industrialisation processes while offering practical insights for planners, policymakers, and industry stakeholders working towards balanced, inclusive, and sustainable industrial growth.

Justification of the Study

The justification for undertaking a study on the spatial distribution and growth of industrial clusters in Haryana (1966–2016) stems from both the academic gaps in existing literature and the practical need for evidence-based policy formulation. Industrial clusters, while well-documented in certain regions of India such as Gujarat, Maharashtra, and Tamil Nadu, have not been systematically studied in the context of Haryana despite its strategic role in the country's industrial transformation. This research therefore fills an important void by providing a comprehensive, long-term analysis of how clusters evolved in Haryana over a fifty-year period (Ghani et al. 2016). From an academic perspective, the study is justified because most existing works on Haryana focus on its agricultural success, particularly the Green Revolution, while its industrialisation story remains underexplored. Yet, the state has emerged as a major industrial hub within India, housing critical clusters in sectors such as automobiles, textiles, engineering, scientific instruments, and agro-processing. Analysing the spatial spread and sectoral growth of these clusters provides a deeper understanding of the state's structural transformation from a primarily agrarian economy to a diversified industrial base.

From a practical perspective, the study is justified because it addresses the regional imbalances in industrial growth within Haryana. While Gurgaon, Faridabad, Panipat, and Ambala have become prominent industrial centres, several other districts remain industrially backward. This uneven growth has contributed to

disparities in employment, income distribution, and urbanisation within the state. A systematic investigation into the factors driving cluster growth in some regions but not in others is essential for policymakers seeking to achieve balanced regional development. Additionally, the study is justified in light of Haryana's proximity to the National Capital Region (NCR), which has had a profound impact on its industrialisation. The growth of Gurgaon into a global hub for automobiles and services illustrates the transformative influence of location and connectivity. Understanding such linkages is vital not only for Haryana's future industrial strategy but also for other states seeking to leverage metropolitan spillover effects for cluster development.

The study also holds justification from a policy evaluation standpoint. Since 1966, Haryana has implemented multiple industrial policies, created industrial estates, and invested in infrastructure. However, the outcomes of these interventions in shaping industrial clusters have not been comprehensively evaluated over the long term. This research offers an opportunity to critically assess the effectiveness of state policies, highlight best practices, and identify areas requiring policy realignment. The study is justified for its forward-looking implications. With the state continuing to push for industrial diversification, global integration, and sustainable development, an understanding of historical cluster patterns is crucial for designing future strategies (Chatterjee and Ganesh-Kumar, 2016). The findings can help Haryana balance growth between developed and lagging regions, strengthen small and medium enterprises (SMEs), and promote industrialisation that is inclusive and sustainable. This study is justified because it fills a research gap, addresses regional development challenges, evaluates the impact of past policies, and provides actionable insights for Haryana's industrial future.

Literature Review

Concept of Industrial Clusters and Agglomeration Economies

The concept of industrial clusters has its intellectual roots in the works of Alfred Marshall (1890), who first introduced the idea of "industrial districts" to describe geographically concentrated groups of firms operating in the same or related industries. Marshall emphasised that such districts generate external economies of scale by enabling firms to benefit from pooled labour markets, availability of specialised suppliers, and knowledge spillovers. Over time, this framework has evolved into what is now widely recognised as industrial clusters, defined as geographic concentrations of interconnected companies, suppliers, and institutions in a particular field that compete but also cooperate. Scholars such as Michael Porter (1990) expanded on this notion, highlighting clusters as key drivers of national and regional competitiveness (Gilbert, 2015). Porter argued that clusters stimulate innovation, improve productivity, and enhance the competitive advantage of firms by providing an ecosystem of rivalry, cooperation, and knowledge exchange. Clusters also reduce transaction costs and promote trust-based relationships among local actors, making them an important mechanism for regional development.

The concept of agglomeration economies is closely linked to industrial clustering. Agglomeration refers to the spatial concentration of economic activities that creates efficiency gains for firms and workers. Economists differentiate between localisation economies and urbanisation economies. Localisation economies arise when firms in the same industry co-locate, benefiting from shared suppliers, skilled labour, and sector-specific knowledge spillovers the very conditions that foster cluster growth. Urbanisation economies, by contrast, emerge from the diversity of industries and population within urban centres, where

firms gain from cross-sectoral linkages, large markets, and diverse service providers. Agglomeration economies have been extensively studied in both developed and developing contexts. In developed economies, studies have shown how clusters such as Silicon Valley (USA), Baden-Württemberg (Germany), and Emilia-Romagna (Italy) have become global leaders in innovation and manufacturing through dense networks of firms and institutions. In developing countries, cluster studies highlight how localised production systems generate employment, encourage entrepreneurship, and integrate small firms into global value chains. In India, clusters such as Tiruppur (knitwear), Ludhiana (hosiery), Surat (diamonds), and Moradabad (brassware) exemplify the potential of agglomeration in promoting regional growth and export competitiveness.

The significance of clusters lies not only in their economic outcomes but also in their ability to foster institutional linkages among firms, industry associations, training institutes, and government agencies. These networks create an enabling environment for innovation and adaptability in a globalised economy. At the same time, the clustering process can also generate challenges, such as excessive concentration, regional imbalances, environmental degradation, and vulnerability to sector-specific downturns. The literature on industrial clusters and agglomeration economies underscores that the spatial organisation of industries is not random but shaped by complex interactions of geography, institutions, and policy. Clusters represent a dynamic framework through which regions can enhance competitiveness, promote entrepreneurship, and sustain industrial growth. For Haryana, understanding this theoretical foundation is critical to analysing how its industrial clusters emerged, expanded, and evolved between 1966 and 2016.

Spatial Distribution of Industries and Regional Development

The spatial distribution of industries has long been a central theme in economic geography and regional development studies. Industrial activities rarely spread evenly across space; instead, they tend to concentrate in specific regions due to historical, geographical, economic, and policy-related factors. Scholars such as Williams et al. (2016) in his Theory of Industrial Location emphasised that industries tend to locate where transport costs, access to raw materials, and labour availability are most favourable. Similarly, advanced the Growth Pole Theory, arguing that industrial growth often occurs around specific "poles" or centres, from which development diffuses unevenly across space. These theories highlight the inherent tendency of industries to cluster in certain areas, creating spatial imbalances in economic development. In the Indian context, the spatial distribution of industries has historically been influenced by colonial legacies, infrastructure networks, and post-independence industrial policies. During the colonial era, industries concentrated around port cities such as Mumbai, Kolkata, and Chennai, where access to markets and raw materials was relatively easier. Post-independence policies aimed at balanced regional development attempted to correct these disparities through the establishment of public sector enterprises, industrial estates, and growth centres in backward regions. However, studies indicate that despite such interventions, industries continued to remain concentrated in states with better infrastructure, skilled labour availability, and proximity to urban markets (Fang and Yu, 2015).

The regional distribution of industries in India has therefore been uneven, with industrial growth strongly concentrated in western and southern states such as Maharashtra, Gujarat, and Tamil Nadu, while large parts of central and eastern India have remained relatively under-industrialised. The liberalisation reforms of the 1990s further accentuated these disparities. Removal of licensing restrictions, relaxation of

investment controls, and inflow of foreign direct investment (FDI) favoured already industrially advanced states with strong connectivity, large urban markets, and investment-friendly policies. As a result, the post-reform period witnessed the emergence of metropolitan-driven clusters such as Bengaluru (IT), Pune (automobiles), and Hyderabad (pharmaceuticals), reinforcing the uneven spatial geography of Indian industrialisation (Fang and Yu, 2015).

The spatial distribution of industries also directly impacts regional development outcomes. Regions with strong industrial bases tend to experience higher levels of employment, urbanisation, and income generation, while industrially backward areas face stagnation, outmigration, and dependence on agriculture. This uneven development reinforces disparities between urban and rural areas, and between core and peripheral regions within states. Cumulative Causation Theory have argued that industrial concentration in certain regions creates a self-reinforcing cycle, where growth attracts further investment and skilled labour, leaving backward areas locked in underdevelopment.

Empirical studies on India further suggest that transportation corridors, proximity to metropolitan regions, and infrastructure quality are decisive factors in shaping industrial distribution. The Delhi-Mumbai Industrial Corridor (DMIC), the Chennai-Bengaluru corridor, and the NCR region illustrate how connectivity and urban agglomeration drive concentrated industrial growth. At the same time, industrial estates and clusters in smaller towns have been promoted to diffuse growth, though their success has varied widely. For a state like Haryana, the concept of spatial distribution is particularly relevant. Its proximity to Delhi and location along national highways positioned it advantageously for industrial development. However, industrialisation has been highly uneven within the state. While Gurgaon, Faridabad, and Panipat have emerged as industrial hubs, districts in the southern and western parts of Haryana remain relatively under-industrialised. Understanding the theoretical and empirical underpinnings of spatial distribution of industries thus provides an essential foundation for analysing Haryana's own industrial geography between 1966 and 2016.

Industrialisation and Economic Transformation in Haryana

The industrialisation of Haryana since its formation in 1966 reflects a gradual but significant shift from a primarily agrarian economy to one increasingly characterised by industrial and service activities. In the initial years after its creation, the state placed priority on strengthening agriculture through the Green Revolution, while simultaneously laying the foundations for small-scale and light industries. Government initiatives, particularly through the establishment of industrial estates and the support of the Haryana State Industrial and Infrastructure Development Corporation (HSIIDC), provided infrastructural and financial assistance to budding enterprises. During this period, industrial growth was modest and largely confined to towns such as Ambala, Panipat, and Faridabad, which already had artisan traditions and small-scale units (Ohlan, 2016). The 1980s and early 1990s marked a phase of diversification and consolidation in Haryana's industrial profile. With improvements in road and rail connectivity, medium and heavy industries, including engineering, chemicals, and textiles, expanded in scale and scope. Specific districts developed specialisations—Faridabad emerged as an engineering hub, Panipat consolidated its textile and carpet industries, and Ambala gained prominence in scientific instruments and machine tools. This diversification signalled the emergence of district-level industrial identities, strengthening the foundation for further growth.

The liberalisation reforms of the 1990s introduced a new dynamic into Haryana's industrialisation. The removal of licensing restrictions, increased openness to foreign investment, and growing integration into global markets fuelled rapid industrial expansion, particularly around the National Capital Region (NCR). Gurgaon, once a relatively small town, transformed dramatically into a hub for automobile manufacturing, information technology, and corporate services. The influx of multinational companies, export-oriented units, and supplier networks fostered a globally connected industrial ecosystem. This period also saw the rise of contract manufacturing and greater private sector involvement, significantly altering the spatial and sectoral composition of Haryana's industrial base (Kumar and Shankhan, 2015). From 2010 to 2016, the industrial landscape of Haryana entered a phase of maturation and spatial restructuring. NCR-linked clusters deepened their dominance, with Gurgaon, Faridabad, and Sonipat becoming leading centres of growth. At the same time, traditional clusters such as Panipat's textiles and Ambala's instruments continued to thrive, though they faced challenges from environmental stress, land use change, and competitive pressures. Agro-based and food-processing industries also expanded in districts such as Karnal and Sonipat, leveraging agricultural surpluses and improved cold-chain infrastructure. However, the period also highlighted concerns of uneven development, with western and southern districts of the state lagging behind in industrial growth.

Haryana's industrial trajectory has been shaped not only by policy but also by geography and its proximity to Delhi. The state's location within the NCR provided unparalleled access to markets, finance, professional services, and skilled labour. Industrial development benefited from cross-border commuting, robust transportation corridors, and the diffusion of metropolitan demand. While this proximity generated positive spillovers, it also created challenges such as land price inflation, congestion, and socio-spatial inequalities. Sectoral specialisations became more visible, with automobile and ancillary industries dominating Gurgaon and Manesar, textiles driving Panipat's economy, and agro-processing strengthening in Karnal and Sonipat. The socio-economic impacts of industrialisation in Haryana have been profound but uneven. On one hand, clustered industrialisation generated employment, accelerated urbanisation, and raised income levels in the more industrially advanced districts. On the other hand, disparities between industrial hubs and peripheral districts widened, with migration, inequality, and environmental degradation emerging as pressing challenges. Overall, the industrial transformation of Haryana between 1966 and 2016 illustrates both the opportunities and imbalances of cluster-led growth, providing a nuanced case of how regional industrialisation unfolds in an agrarian-based state transitioning towards a diversified economy.

Determinants of Cluster Growth in Haryana

The growth of industrial clusters in Haryana between 1966 and 2016 has been shaped by a combination of geographical, infrastructural, institutional, and policy-related factors. At the most fundamental level, the state's proximity to the National Capital Region (NCR) has been one of the most decisive determinants. The closeness to Delhi provided firms in Haryana with easy access to a large consumer market, advanced financial and professional services, and global connectivity. Gurgaon's transformation into an automobile and corporate hub illustrates how spatial proximity to a metropolitan centre creates multiplier effects in terms of investment, innovation, and employment. The NCR's infrastructure and urban spillovers thus acted as a powerful magnet for industrial concentration. Infrastructure development has been another critical determinant of cluster growth in Haryana (Banerjee-Guha, 2016). The expansion of highways, expressways, and rail networks significantly reduced transport costs and improved linkages between

production centres and markets. The development of the Delhi–Gurgaon expressway and the integration of Haryana into the Delhi–Mumbai Industrial Corridor (DMIC) boosted industrial concentration along these routes. Similarly, reliable electricity supply, telecommunication networks, and logistics facilities facilitated the growth of clusters by enabling firms to maintain production efficiency and integrate with supply chains. Districts with better infrastructure, such as Gurgaon, Faridabad, Panipat, and Sonipat, were able to attract larger investments compared to relatively underdeveloped districts in western Haryana.

Government policies and institutional support have also played a pivotal role in the emergence of clusters. The Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) established industrial estates and sector-specific parks across districts, providing firms with land, utilities, and basic services. Tax incentives, subsidies, and credit facilities for small-scale industries in the 1970s and 1980s enabled the growth of local entrepreneurial clusters. Later, post-liberalisation policies in the 1990s and 2000s focused on attracting foreign direct investment (FDI) and encouraging export-oriented industries. Gurgaon's rise as an automobile hub, for instance, was catalysed by proactive state policies, land allocation to multinational corporations, and investment in supporting infrastructure. Entrepreneurial culture and labour availability were equally important determinants of cluster development (Punia et al. 2015). Traditional skills in weaving and textile processing supported the emergence of Panipat as a globally recognised textile and carpet cluster, while Ambala's long-standing reputation in scientific instruments fostered a specialised industrial base. The availability of semi-skilled and skilled labour, partly drawn from neighbouring states through migration, provided firms with the workforce necessary for expansion. At the same time, local entrepreneurship in small and medium enterprises (SMEs) contributed to building dense networks of suppliers and subcontractors, strengthening the inter-firm linkages essential for cluster growth.

Technological adoption and global linkages further shaped Haryana's cluster dynamics. The liberalisation reforms of 1991 opened new opportunities for multinational corporations and export-oriented firms to establish operations in the state. Access to modern technology, international markets, and global production networks gave clusters like Gurgaon a competitive edge. Similarly, Panipat's integration into global textile trade and Faridabad's role in engineering exports highlight how global demand acted as a driver of cluster growth. The determinants of industrial cluster growth in Haryana were multi-dimensional and interlinked. Geographic proximity to Delhi provided the initial advantage, but it was reinforced by state-led infrastructure investment, proactive industrial policies, entrepreneurial initiative, labour availability, and integration into global markets (Devasenapathy et al. 2016). At the same time, the uneven distribution of these factors explains why some districts evolved into thriving industrial clusters while others remained relatively underdeveloped. The interplay of these determinants underscores that cluster growth is not merely a spontaneous process but the result of deliberate policy choices, spatial advantages, and socio-economic conditions.

Methodology

This study adopts a qualitative and historical-analytical research approach to examine the spatial distribution and growth of industrial clusters in Haryana between 1966 and 2016. The analytical framework of the study draws upon concepts of industrial clusters, agglomeration economies, and regional development to interpret patterns of industrial growth. A spatial analysis was undertaken to identify districts with higher concentrations of industries and to examine how geographical proximity to the National Capital

Region (NCR) influenced their development. A comparative assessment was also carried out between advanced clusters such as Gurgaon, Faridabad, Panipat, and Ambala and lagging regions such as Hisar, Bhiwani, and Mahendragarh to highlight the determinants of uneven growth. Sectoral clustering was analysed by mapping industries such as automobiles, textiles, agro-processing, engineering, and information technology across different regions of the state.

To strengthen the findings, visual representations in the form of tables and maps were prepared to illustrate the spatial distribution of industries, their sectoral specialisations, and the challenges faced by different clusters. By combining historical analysis with spatial and comparative methods, the study provides a comprehensive understanding of the evolution of industrial clusters in Haryana and their role in the state's economic transformation.

Results and Discussion

The analysis of the spatial distribution and growth of industrial clusters in Haryana between 1966 and 2016 reveals a complex pattern of development marked by concentration, diversification, and regional disparities. The findings, when interpreted against the backdrop of the literature review, highlight how clusters emerged through a combination of geographical advantages, infrastructural expansion, state policies, and entrepreneurial dynamism (Gilbert, 2015). One of the most significant results is the dominance of industrial growth in districts adjoining the National Capital Region (NCR), especially Gurgaon, Faridabad, and Sonipat. Gurgaon's transformation into a global hub for automobile manufacturing, information technology, and corporate services illustrates the strong influence of proximity to Delhi, as highlighted in the literature on agglomeration economies. This metropolitan proximity allowed industries to benefit from shared markets, advanced infrastructure, skilled labour, and global linkages. Similarly, Faridabad developed as a centre for engineering and manufacturing industries, while Sonipat and Manesar emerged as ancillary and logistics hubs. These results confirm the argument that geography, connectivity, and urban spillovers were decisive in shaping Haryana's industrial clusters.

The study also reveals the persistence of traditional industrial clusters in towns like Panipat and Ambala. Panipat consolidated its identity as a textile and carpet hub, leveraging historical skills and its access to export markets. Ambala maintained its prominence in scientific instruments and light engineering, showcasing how inherited artisanal and entrepreneurial traditions can sustain cluster identities over decades (Kumar and Shankhan, 2015). However, these traditional clusters faced challenges of technological upgradation, environmental stress, and competition, aligning with the literature that warns of structural vulnerabilities in specialised clusters. Another key finding is the role of state policy in directing industrial growth. The establishment of industrial estates and sector-specific parks by HSIIDC, along with fiscal incentives for small and medium enterprises, facilitated the spread of industries during the 1970s and 1980s. Post-liberalisation reforms accelerated this growth by attracting multinational corporations and foreign direct investment, especially in Gurgaon. The results thus validate the literature's claim that cluster growth is not merely spontaneous but is nurtured by state interventions and global economic shifts.

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Table: Industrial Clusters in Haryana (1966–2016) – Growth, Drivers, and Challenges

District / Cluster	Period of Growth	Key Industries	Major Drivers	Key Challenges
Faridabad	1966–1980s (early industrial hub), consolidation in 1990s	Engineering goods, manufacturing, light industries	Proximity to Delhi, early industrial estates, transport links	Pollution, congestion, rising land costs
Gurgaon (now Gurugram) & Manesar	1990s–2016 (post-liberalisation boom)	Automobiles, IT, corporate offices, services	FDI inflows, NCR proximity, expressways, state policy incentives	Land price escalation, labour unrest, inequality
Panipat	1970s–2016 (sustained traditional cluster)	Textiles, carpets, handlooms, oil refining	Traditional skills, export orientation, agro-linkages	Environmental stress, competition from imports, technological gaps
Ambala	1966–2000s (steady traditional base)	Scientific instruments, light engineering, pharmaceuticals	Historic artisanal tradition, SME base, domestic demand	Stagnation, limited global integration, scale limitations
Sonipat & Kundli	1980s–2016 (expansion phase)	Agro-processing, food industries, packaging, furniture	Agricultural surplus, Delhi market proximity, DMIC corridor	Infrastructure strain, uneven growth in rural parts
Karnal	1980s–2016 (agro-based rise)	Agro-processing, dairy, food products	Green Revolution surplus, cold chain, proximity to NCR	Seasonal dependence, limited diversification
Hisar	1970s–1990s (moderate growth)	Steel, textiles, agriculture-related industries	Availability of raw material, small industries support	Decline post-liberalisation, competition, weak connectivity
Yamunanagar	1970s–2016	Paper, plywood, wood products	Timber availability, SME entrepreneurship	Resource depletion, environmental concerns
Bhiwani, Mahendragarh, Rewari	Limited growth, 1966–2016	Small-scale industries, agro-based activities	Local demand, small clusters	Peripheral location, poor infrastructure, limited investment
Rohtak & Jhajjar	2000s–2016 (emerging hubs)	Education-linked industries, agro-processing, light manufacturing	New industrial estates, proximity to NCR, rail connectivity	Still nascent, infrastructure gaps

(Source : Financial Report by Government of Haryana)

The period between 2000 and 2016 reflects a dual dynamic of consolidation and imbalance. On one hand, Gurgaon, Faridabad, and Sonipat emerged as mature clusters integrated into global value chains, benefiting from advanced infrastructure and continuous capital inflows. On the other hand, western and southern districts of Haryana, such as Hisar, Bhiwani, and Mahendragarh, experienced relatively slow industrial development, remaining dependent on agriculture and small-scale activities. This uneven distribution reinforces the literature's emphasis on regional disparities as an outcome of uneven determinants of cluster growth. The spatial concentration of industries around the NCR also contributed to rising land prices, congestion, and socio-economic inequality, highlighting the trade-offs of cluster-led development (Banerjee-Guha, 2016). The findings also underscore the sectoral diversification of Haryana's industrial base over time. While textiles, engineering, and agro-processing dominated the early phases, the later decades saw the rapid rise of automobiles, IT, and services. Agro-based clusters in Karnal and Sonipat illustrate how agricultural surpluses can be transformed into value-added industries, while Gurgaon's automobile sector demonstrates the integration of clusters into global supply networks. These results align with the literature that industrialisation fosters economic transformation by expanding sectoral diversity and linking traditional and modern industries. The results and discussion suggest that Haryana's industrial trajectory between 1966 and 2016 was shaped by a synergy of geographic advantages, infrastructural investments, proactive policies, and entrepreneurial culture. While cluster growth generated employment, urbanisation, and global integration, it also accentuated regional imbalances and environmental challenges. The experience of Haryana thus illustrates both the opportunities and limitations of cluster-led industrialisation in a rapidly transforming state economy.

Conclusion

The study of industrial clusters in Haryana from 1966 to 2016 demonstrates the critical role of spatial factors, policy interventions, and entrepreneurial dynamism in shaping regional industrial development. The findings reveal that the NCR-adjoining districts of Gurgaon, Faridabad, and Sonipat emerged as dominant industrial hubs due to their geographical proximity to Delhi, infrastructural advantages, and favourable investment policies. Traditional clusters such as Panipat and Ambala sustained their industrial identities through artisanal heritage and export orientation, while agro-based clusters in Karnal and Sonipat capitalised on agricultural surpluses. Conversely, western and southern districts like Hisar, Bhiwani, and Mahendragarh experienced sluggish industrial growth, reflecting the uneven distribution of infrastructural and policy support.

The results highlight both the opportunities and challenges of cluster-led industrialisation. On the one hand, industrial clusters generated employment, urbanisation, and global integration, transforming Haryana into one of India's fastest-growing economies. On the other hand, they created spatial imbalances, environmental stress, and rising inequalities between developed and lagging regions. Haryana's industrial trajectory illustrates the dual nature of cluster growth: while it accelerates economic transformation through agglomeration economies, it also risks perpetuating regional disparities unless supported by balanced industrial policies. For the future, the state must focus on inclusive industrial planning, equitable infrastructure investment, and sustainable practices to ensure that cluster-led development contributes to balanced regional growth.

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