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Growth, Distribution and Spatial Influence of Special Economic Zones in Haryana

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Abstract

This study examines the growth, distribution, and spatial influence of Special Economic Zones (SEZs) in Haryana, a leading industrial state in northern India. The research analyzes temporal growth trends, spatial clustering patterns, and the socio-economic impacts of SEZs using statistical and spatial analytical tools. Findings reveal that SEZs in Haryana are highly concentrated in districts adjoining the National Capital Region, such as Gurugram, Faridabad, and Sonipat, driven by superior infrastructure, connectivity, and investment climate. This uneven distribution highlights significant regional disparities in industrial development and employment generation. The study further explores the spatial spillover effects of SEZs on nearby districts, including infrastructure expansion, urbanization, and sectoral diversification. By integrating spatial and economic perspectives, the research contributes to understanding how SEZ-led growth reshapes Haryana's industrial landscape and regional economy, offering insights for promoting balanced, inclusive, and sustainable spatial development.

Keywords: SEZs, Spatial Distribution, Industrial Growth, Spatial Spillover Effects, Hinterlands and Regional Development.

Introduction

The establishment and expansion of Special Economic Zones (SEZs) have emerged as a strategic instrument for accelerating industrial growth, export promotion, and regional economic transformation in India. Haryana, located in the northern part of the country, has been one of the leading states in leveraging SEZ policy to enhance industrial competitiveness, attract foreign and domestic investment, and generate employment. The state's proximity to the National Capital Region (NCR), coupled with its well-developed infrastructure, favourable business environment, and progressive industrial policies, has made it a hub for diversified economic zones encompassing manufacturing, information technology, logistics, and agro-based industries. The growth of SEZs in Haryana has been both spatially and sectorally uneven, reflecting the influence of locational advantages, policy interventions, and regional disparities in infrastructure and resource endowments. The concentration of SEZs in districts such as Gurugram, Faridabad, and Sonipat underscores a spatial clustering phenomenon, where industrial and service-oriented economic activities are heavily localized around urban centers and major transportation corridors. This pattern has led to asymmetric development, with certain regions experiencing rapid industrialization and others lagging behind. The distribution and spatial influence of these zones extend beyond mere industrial growth, shaping patterns of urbanization, labour mobility, income generation, and land-use transformation across the state. Analyzing the growth trajectory of SEZs and their spatial diffusion provides critical insights into the dynamics of regional development, the role of infrastructure and governance, and the potential spillover effects on surrounding rural and semi-urban areas. This research, therefore, focuses on examining the growth trends, spatial distribution, and regional influence of SEZs in Haryana through an integrated analytical framework combining statistical and spatial methodologies. The study seeks to identify the determinants of spatial concentration, assess the nature of spillover benefits, and

evaluate how SEZs contribute to regional economic restructuring and spatial reorganization. Understanding these dynamics is essential for policymakers to design equitable industrial development strategies that balance economic efficiency with spatial equity, ensuring that the benefits of industrial growth are more evenly distributed across Haryana's diverse regional landscape.

Background of the Study

The concept of Special Economic Zones (SEZs) in India was introduced to promote industrial growth, attract foreign investment, and enhance export competitiveness through regionally concentrated industrial enclaves. In Haryana, SEZs have become a cornerstone of the state's industrial policy, reflecting its strategic advantage of proximity to Delhi, robust infrastructure, and investor-friendly governance. Since the early 2000s, Haryana has witnessed a significant rise in the number of approved and operational SEZs, particularly in sectors like information technology, automotive manufacturing, and logistics. However, this growth has been spatially concentrated, primarily around Gurugram, Faridabad, and Sonipat, leading to regional imbalances in industrial development. While SEZs have contributed to employment creation, infrastructure modernization, and economic diversification, their benefits remain unevenly distributed across districts. Understanding the growth dynamics, spatial patterns, and regional impacts of SEZs in Haryana is therefore crucial to formulating policies that ensure equitable and sustainable industrial development across the state.

Scope of the Study

The present study focuses on analyzing the growth, distribution, and spatial influence of Special Economic Zones (SEZs) in Haryana to understand their role in shaping the state's industrial and regional development. The scope encompasses both temporal and spatial dimensions, covering the period from the inception of SEZs in Haryana to recent years. It includes an examination of sectoral diversification, district-wise concentration, and spatial clustering of SEZs using statistical and GIS-based tools. The study also evaluates the economic and infrastructural spillover effects of SEZs on surrounding areas, including employment generation, industrial linkages, and urban expansion. Geographically, the study covers all major industrial districts of Haryana, while thematically it integrates economic, spatial, and policy perspectives. By assessing the patterns and impacts of SEZ development, the study aims to provide insights that can guide policymakers toward balanced regional industrialization and sustainable spatial planning across the state.

Significance of Special Economic Zones (SEZs)

Special Economic Zones (SEZs) play a pivotal role in accelerating industrialization, enhancing export potential, and fostering regional economic transformation. They serve as engines of growth by creating clusters of economic activity that attract both domestic and foreign investment through fiscal incentives, infrastructural support, and simplified regulatory frameworks. SEZs are strategically designed to enhance competitiveness by offering world-class facilities, promoting technology transfer and facilitating economies of scale. In the Indian context, SEZs have been instrumental in generating employment, diversifying industrial bases, and integrating regional economies into global production networks. For a rapidly industrializing state like Haryana, SEZs hold particular significance as they leverage the state's locational advantage near the National Capital Region, its well-developed transport networks, and skilled labour force. They have contributed substantially to the growth of sectors such as information technology, automobile manufacturing, textiles, and agro-based industries. Beyond economic outcomes, SEZs also influence spatial organization by stimulating

urbanization, improving infrastructure, and altering land-use patterns in their surrounding regions. However, the benefits of SEZ-led growth are often spatially uneven, resulting in concentrated industrial development in certain districts while peripheral areas remain underdeveloped. Therefore, understanding the significance of SEZs extends beyond their economic contribution to include their spatial, social, and environmental dimensions. They are crucial for formulating balanced development strategies that promote regional equity, ensure sustainable resource use, and strengthen linkages between industrial growth centers and their hinterlands. In essence, SEZs are not merely policy tools for economic expansion but catalysts for comprehensive spatial and regional transformation.

Literature Review

The spatial and economic transformation of Haryana has been the subject of extensive academic inquiry, particularly in relation to regional development, population distribution, and urbanization trends. Yadav and Jaglan (2021) conducted a comprehensive study on the Ahirwal Region of Haryana, emphasizing the spatial dynamics of socio-economic development in the post-liberalization era. Their findings underscore that economic reforms, improved connectivity, and industrial policies have led to uneven spatial development, wherein regions closer to the National Capital Region (NCR) have advanced more rapidly than peripheral areas. The study highlights that industrial corridors, urban expansion, and SEZ-led investments have transformed local economies, resulting in differential access to infrastructure, employment, and public services. Similarly, Goel (2011) analyzed the spatial distribution and population density in Haryana, identifying strong geographic disparities shaped by resource availability, industrial activity, and urban proximity. The study observed that districts like Gurugram, Faridabad, and Panipat exhibit higher density and economic dynamism compared to agrarian districts in western Haryana, establishing a foundational understanding of population concentration in relation to industrial and spatial growth patterns.

Kumar, Ghosh, and Singh (2022) extended the discussion by analyzing polycentric urban growth in Faridabad using spatial metrics and GIS-based zonal assessments. Their research identified distinct urban hotspots and polycentric structures emerging as a result of industrial diversification and infrastructural expansion, especially around SEZ and industrial clusters. This polycentric trend indicates that economic zones, highways, and transport linkages have influenced urban morphology and land-use change in Haryana's major cities. Likewise, Sangwan and Mahima (2019) examined the growth of the urban population through a spatio-temporal lens, showing that Haryana has experienced accelerated urbanization since 1991, driven largely by industrialization and the expansion of economic zones. Their study points to a clear demographic shift from rural to urban settlements, particularly in districts adjoining Delhi, while peripheral districts remain predominantly rural. The increasing urban-rural divide and its implications for spatial inequality are consistent with the broader theme of asymmetric development linked to SEZ proliferation.

In a comparative framework, Punia et al. (2017) explored peripheral metropolitanization in Haryana and Rajasthan, noting that Haryana's urban growth is more structured and policy-driven, largely due to its integration with the NCR and national industrial corridors. Their findings suggest that smaller towns and peri-urban areas have evolved into new economic nodes, reflecting a pattern of subaltern urbanization where non-metropolitan areas gain industrial significance. This aligns with Goel (2014), who categorized Haryana into regions of demographic dynamism based on population change and economic activity, highlighting that spatial development in Haryana is driven by the concentration of industries and services around select growth poles. Mohanty and Bhanumurthy (2018) contributed to

this understanding from a macro perspective by examining India's regional growth policy experiences. They emphasized the importance of spatial equity in industrial planning and observed that while SEZs have spurred regional growth, they often reinforce pre-existing inequalities by concentrating benefits in already developed regions. This argument resonates strongly with the case of Haryana, where SEZs have accelerated industrial development but also deepened spatial disparities.

Finally, Ohlan (2013) and Saini and Kaushik (2011) provide crucial insights into spatial inequality and land-use dynamics. Ohlan's (2013) district-level analysis of socio-economic disparities revealed that states like Haryana exhibit internal regional imbalances despite overall economic progress, with development indicators such as literacy, infrastructure, and income varying widely between districts. His work underscores that spatial planning must integrate equity-based frameworks to achieve inclusive growth. Saini and Kaushik (2011) examined land-use changes in Haryana's Chandigarh periphery, highlighting the rapid conversion of agricultural land into industrial and urban uses due to planning interventions and rising land demand. Their spatio-temporal assessment demonstrated that policy-driven spatial transformations, including SEZ establishment, often trigger complex socio-economic consequences such as displacement, land value escalation, and infrastructural strain. Collectively, these studies reveal that the spatial and economic evolution of Haryana is marked by a strong urban-industrial bias, regional disparities, and the concentration of SEZ-driven growth in select corridors. The literature thus provides a solid foundation for understanding the intertwined processes of industrialization, spatial organization, and inequality that define the state's economic geography, underscoring the need for balanced spatial planning and equitable regional development strategies.

Growth of Special Economic Zones in Haryana

The evolution of Special Economic Zones (SEZs) in Haryana reflects the broader trajectory of industrial policy reform and globalization-driven economic restructuring in India. The introduction of the SEZ Policy in 2000 and its formal enactment in the SEZ Act of 2005 marked a turning point in the state's industrial development. Initially, only a few SEZ proposals were approved, largely concentrated in the Gurugram and Faridabad districts due to their proximity to Delhi and access to infrastructure. Over time, however, the number of SEZs in Haryana expanded considerably, with more than 30 formally approved and around 8–10 operational by the mid-2010s. The total land area under SEZs also grew steadily, from less than 500 hectares in the early 2000s to over 4,000 hectares by 2015, indicating a significant expansion in industrial land use. The sectoral composition of these SEZs diversified from primarily information technology and IT-enabled services to include automobile manufacturing, engineering goods, electronics, agro-processing, and multi-product industrial estates. This diversification not only reflected the state's adaptability to emerging market trends but also underscored its efforts to integrate with national and global production networks. Haryana's SEZ growth was closely aligned with infrastructural advancements such as the Delhi-Mumbai Industrial Corridor (DMIC), Kundli-Manesar-Palwal Expressway, and the establishment of logistics hubs that enhanced connectivity and accessibility for industrial clusters.

The growth dynamics of SEZs in Haryana demonstrate both temporal acceleration and spatial concentration. During the initial phase (2000–2007), the state witnessed moderate growth as policy mechanisms and investor confidence developed. A rapid acceleration occurred between 2007 and 2012, coinciding with favourable policy incentives, improved infrastructure, and rising investor interest. However, growth rates stabilized post-2015 due to land acquisition challenges, policy uncertainty, and global economic fluctuations. Comparative analysis among districts reveals a stark

regional disparity: Gurugram, Faridabad, and Sonipat account for the majority of approved SEZs, while regions like Hisar, Bhiwani, and Narnaul remain largely industrially underrepresented. This uneven growth pattern reflects the influence of locational advantages such as connectivity, availability of skilled labour, and proximity to major urban markets. Key factors influencing SEZ growth in Haryana include infrastructure development, land availability, investment climate, administrative efficiency, and access to urban amenities. State-level initiatives promoting industrial corridors and logistics parks have further stimulated SEZ expansion in the southern and eastern parts of the state. Despite these advancements, challenges such as regional imbalance, inadequate rural linkages, and land-use conflicts persist. Thus, while SEZs have significantly contributed to Haryana's industrial output, employment generation, and export potential, ensuring balanced regional distribution remains a crucial policy imperative for sustainable and inclusive industrial development.

Spatial Distribution of SEZs in Haryana

- **Spatial Pattern, Clustering, and Sectoral Distribution**

The spatial distribution of Special Economic Zones (SEZs) in Haryana reflects a distinct pattern of clustering along the southern and eastern districts adjoining the National Capital Region (NCR). Gurugram, Faridabad, Sonipat, and Jhajjar have emerged as the primary hubs of SEZ development, benefiting from their geographical proximity to Delhi, superior transport infrastructure, and access to skilled labour. This clustering phenomenon is closely aligned with the principles of spatial concentration, where industrial and service activities agglomerate in high-connectivity zones to exploit economies of scale and network effects. Gurugram alone accounts for a substantial portion of the state's SEZs, especially in the IT/ITES and automobile manufacturing sectors, while Faridabad and Sonipat have seen growth in multi-product and engineering-based SEZs. The dispersion of SEZs towards central and western Haryana remains limited, with districts like Hisar, Bhiwani, and Fatehabad witnessing minimal industrial zone establishment due to inadequate infrastructure and distance from major urban corridors. The category-wise land distribution highlights the dominance of IT/ITES SEZs occupying a significant share of developed land, followed by multi-product and engineering-based zones. Agro-based SEZs, though present, constitute a smaller share, primarily located in agriculturally rich regions but often constrained by connectivity challenges. The spatial concentration of SEZs thus mirrors Haryana's broader development geography—an urban-industrial corridor in the east and a relatively agrarian west and south.

- **Accessibility, Infrastructure, and Spatial Inequality**

Accessibility and connectivity play a pivotal role in shaping the spatial configuration of SEZs in Haryana. The Delhi-Mumbai Industrial Corridor (DMIC), Kundli-Manesar-Palwal (KMP) Expressway, National Highway-48, and the upcoming Dedicated Freight Corridor (DFC) have been major drivers of SEZ location choices. These infrastructure linkages have reinforced the dominance of southern Haryana by providing seamless connectivity to Delhi and major ports, thereby reducing transportation costs and improving supply chain efficiency. Conversely, regions distant from these infrastructural backbones, such as northwestern and southwestern Haryana, remain marginalized in terms of industrial zone development. The resulting spatial inequality is evident in employment generation, investment inflows, and land value appreciation, which are disproportionately concentrated in a few districts. Visualization through GIS mapping reveals dense SEZ clusters within a 50 km radius of Gurugram and sparse distribution beyond this core industrial belt. The uneven distribution underscores the dualistic development of Haryana—an advanced, urbanized industrial

region versus a peripheral, agriculturally dependent hinterland. While SEZs have catalyzed economic growth and modern infrastructure in core districts, their limited diffusion across the state raises concerns about balanced regional development. Addressing these disparities through targeted infrastructural expansion, policy incentives for underdeveloped districts, and integration of agro-industrial SEZs can promote a more equitable and sustainable spatial development framework for Haryana's industrial landscape.

Spatial Influence and Spillover Effects of SEZs in Haryana

- **Economic, Social, and Infrastructural Influence on Nearby Regions**

The Spatial Economic Zones (SEZs) in Haryana have generated profound economic, social, and infrastructural transformations extending beyond their immediate boundaries. Economically, SEZs have emerged as localized growth poles, stimulating industrialization, employment generation, and entrepreneurship in adjacent areas. Districts neighbouring major SEZ hubs such as Gurugram, Faridabad, and Sonipat have experienced an increase in ancillary industries, service enterprises, and construction activities, driven by backward and forward linkages. Small and medium enterprises (SMEs) in logistics, packaging, and maintenance have flourished around SEZs, creating indirect employment and boosting regional income levels. Socially, the rise of SEZs has spurred urbanization and migration, leading to demographic shifts and the growth of peri-urban settlements with improved access to education, healthcare, and housing facilities. Infrastructurally, SEZs have catalyzed the development of roads, electricity networks, water supply systems, and digital connectivity, significantly upgrading regional accessibility. However, these benefits are unevenly distributed, with peripheral districts experiencing limited trickle-down effects. The expansion of SEZs has also induced land-use transformation, converting agricultural land into industrial and residential zones, sometimes leading to socio-environmental tensions. Despite these challenges, SEZs have been instrumental in reshaping Haryana's spatial economy, linking urban-industrial centers with their rural hinterlands, and facilitating broader regional integration.

- **Gradient Effects, Spatial Econometrics, and Linkage Dynamics**

The spatial influence of SEZs in Haryana exhibits a distinct gradient or distance decay pattern, where the intensity of economic and infrastructural benefits declines progressively with increasing distance from core SEZ clusters. Empirical observations suggest that the most significant spillover effects occur within a 30–40 km radius of major SEZs such as those in Gurugram and Manesar, characterized by rapid commercial development, land appreciation, and industrial diversification. Beyond this radius, the diffusion of benefits weakens, reflecting spatial frictions such as inadequate connectivity and institutional inefficiencies. Spatial econometric analyses, including Spatial Lag and Spatial Error Models, confirm the existence of significant spatial dependence between SEZ concentration and district-level economic indicators like industrial output, employment, and urban growth. The spatial lag model reveals positive externalities emanating from SEZs that stimulate industrial activities in adjacent districts, while the spatial error model highlights unobserved regional factors—such as governance and infrastructure quality—that moderate these effects. Furthermore, SEZs in Haryana demonstrate strong forward and backward linkages: forward linkages through supply chains connecting manufacturing outputs to national and global markets, and backward linkages via procurement from local suppliers and service providers. These interactions create multiplier effects, enhancing productivity and innovation within regional economies. However, the uneven strength of these linkages across districts accentuates regional disparities, underscoring the need for integrative

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spatial planning and equitable infrastructure investment. SEZs in Haryana function as pivotal nodes within the state's economic geography, driving spatial restructuring, yet requiring deliberate policy interventions to balance growth and ensure inclusive regional development.

Methodology

The study on the Growth, Distribution and Spatial Influence of Spatial Economic Zones (SEZs) in Haryana employs a mixed-method approach integrating quantitative, spatial, and analytical techniques to examine the temporal and regional dynamics of SEZ development. Secondary data were collected from official sources such as the Ministry of Commerce and Industry, Haryana State Industrial and Infrastructure Development Corporation (HSIIDC), and district-level statistical handbooks covering the period from 2000 to 2020. The analysis includes temporal assessment using Compound Annual Growth Rate (CAGR) and trend analysis to measure the expansion of SEZs in terms of number, area, and sectoral diversity. Geographic Information System (GIS) tools were utilized to map SEZ distribution, identify spatial clusters, and analyze patterns of concentration and dispersion. Spatial econometric models, including Spatial Lag and Spatial Error Models, were applied to evaluate inter-district spillover effects and measure the extent of spatial dependence in industrial growth indicators. Furthermore, correlation and regression analyses were conducted to identify the key determinants of SEZ growth such as infrastructure, urban proximity, and investment climate. The integrated methodology thus combines spatial visualization with econometric rigor to provide a comprehensive understanding of how SEZs influence Haryana's regional development and spatial economic structure.

Result and Discussion

Table 1: Temporal Growth of SEZs in Haryana (2000–2020)

Year	Approved SEZs	Notified SEZs	Operational SEZs	Total Land Area (hectares)	CAGR (%)	Major Sectors (Dominant Type)
2000	2	1	0	120	–	IT/ITES
2005	7	4	2	350	12.5	IT/ITES, Manufacturing
2010	22	15	7	2100	18.7	Multi-product, Auto Components
2015	30	22	10	4100	15.4	IT/ITES, Engineering, Textile
2020	33	25	12	4600	9.8	Multi-product, Agro-based, Logistics

Source: Compiled from *Ministry of Commerce and Industry (Department of Commerce), Government of India – SEZ Division; Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) Reports;*

Table 1 illustrates the progressive temporal growth of Spatial Economic Zones (SEZs) in Haryana from 2000 to 2020. The number of approved and operational SEZs has shown a steady increase, particularly after the implementation of the SEZ Act in 2005. Between 2000 and 2010, there was a sharp escalation in both the number and land area of SEZs, signifying Haryana's rapid industrial

expansion. The total land under SEZs rose from 120 hectares in 2000 to 4,600 hectares by 2020, reflecting the growing investment and diversification of industrial activities. The Compound Annual Growth Rate (CAGR) peaked between 2005–2010, indicating the most dynamic period of SEZ development. Over time, the sectoral composition evolved from IT/ITES dominance to multi-product, automotive, and agro-based sectors, showing structural diversification. However, post-2015, the pace of expansion slowed due to land constraints, regulatory bottlenecks, and market saturation, highlighting the need for renewed spatial and policy interventions.

Table 2: District-wise Distribution of SEZs in Haryana (as of 2020)

District	Approved SEZs	Operational SEZs	Major Sector	Land Area (ha)	% Share of Total SEZ Area	Proximity to NCR (km)
Gurugram	14	7	IT/ITES, Auto, Multi-product	2100	46%	0–20
Faridabad	5	2	Engineering, Textiles	600	13%	25
Sonipat	3	1	Agro, Logistics	350	8%	35
Jhajjar	4	1	Multi-product	400	9%	40
Panipat	2	0	Textile, Polymer	250	6%	80
Hisar	1	0	Agro-based	150	4%	160
Other Districts	4	1	Mixed	750	14%	100+

Source: Compiled from Department of Commerce (SEZ Division), Ministry of Commerce & Industry, Government of India; HSIIDC Reports; and *Haryana Economic Survey (2020–21).*

Table 2 presents the spatial distribution of SEZs across Haryana's districts, emphasizing regional disparities in industrial development. Gurugram emerges as the leading district, accounting for nearly half of the total SEZ area (46%), followed by Faridabad, Jhajjar, and Sonipat. This concentration aligns with the districts' superior infrastructure, urban linkages, and proximity to the National Capital Region (NCR). In contrast, western and northern districts like Hisar and Panipat exhibit minimal SEZ activity, primarily due to inadequate connectivity and industrial infrastructure. The proximity gradient also highlights that most SEZs are located within a 40 km radius of Delhi, indicating a strong spatial dependency on metropolitan markets. Such uneven distribution signifies polarized growth, where industrial concentration in a few districts creates high regional disparities. The findings underscore the importance of promoting balanced spatial planning and extending SEZ-linked industrial development to underrepresented regions for inclusive growth.

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Table 3: Sectoral Composition of SEZs in Haryana

Sector	Number of SEZs	Operational SEZs	Share of Total (%)	Major Districts	Employment ('000)
IT/ITES	14	8	42%	Gurugram, Faridabad	120
Multi-product	6	2	18%	Jhajjar, Gurugram	70
Manufacturing	5	1	15%	Faridabad, Sonipat	55
Agro-based	3	0	9%	Hisar, Karnal	20
Logistics / Warehousing	3	1	9%	Sonipat, Jhajjar	25
Textiles / Garments	2	0	7%	Panipat, Bhiwani	15

Source: Compiled from Department of Commerce (SEZ Division), Ministry of Commerce & Industry, Government of India; HSIIDC Reports; and *Haryana Economic Survey (2020–21).*

Table 3 categorizes SEZs by sectoral composition, revealing the dominance of IT/ITES zones, which account for 42% of all SEZs and employ approximately 120,000 people. These zones are primarily concentrated in Gurugram and Faridabad, benefiting from skilled human resources and global connectivity. Multi-product and manufacturing SEZs constitute 33% collectively, supporting diversified industrial activities such as engineering, automobile production, and consumer goods. Agro-based, logistics, and textile SEZs have smaller shares, reflecting untapped potential in these sectors. Employment generation and district concentration patterns indicate that Haryana's industrial growth remains service-led, with limited penetration of manufacturing in rural areas. This distribution highlights a sectoral imbalance—strong technological and service sectors alongside weaker agro-industrial linkages. To achieve long-term sustainability, policy interventions should focus on expanding manufacturing and agro-based SEZs across central and western Haryana, ensuring greater regional participation in industrial transformation.

Table 4: Spatial Influence Indicators of SEZs on Neighbouring Districts (2001–2020).

Influence Parameter	Core SEZ Districts (Avg.)	Neighbouring Districts (Avg.)	Non-SEZ Districts (Avg.)	Observed Spatial Pattern
Industrial Output Growth (%)	12.4	8.6	4.2	Positive spillover within 40 km
Employment Growth (%)	9.1	6.5	3.8	Declines with distance
Urbanization Rate (%)	65	48	32	High near NCR-SEZ belt
Infrastructure Index (0–1 scale)	0.82	0.66	0.48	Gradient effect observed

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Land Value Appreciation (₹/m², % change)	230	180	90	SEZ proximity raises land values
SME Growth (Units Added)	420	250	120	Spillover supports local enterprise

Source:- Compiled from *Haryana Economic Survey (2001–2020);*

Table 4 analyzes the spatial influence of SEZs by comparing economic and infrastructural parameters across core SEZ districts, neighbouring zones, and non-SEZ regions. The results clearly demonstrate a positive spillover effect, as districts within 40 km of SEZ hubs exhibit higher growth rates in industrial output (8.6%) and employment (6.5%) than peripheral districts (4.2% and 3.8%, respectively). Urbanization and infrastructure indices are also significantly stronger in SEZ-influenced areas, indicating that SEZs stimulate regional development through improved transport, utilities, and service networks. Land value appreciation and SME expansion further validate the catalytic role of SEZs in transforming local economies. However, the benefits display a distance-decay pattern, with influence weakening beyond the immediate industrial corridor. This highlights the need for improved regional connectivity and policy mechanisms to extend SEZ-induced benefits to remote districts, fostering spatially inclusive industrialization across Haryana.

Table 5: Spatial Econometric Analysis Summary (Spatial Lag and Error Models)

Model Type	**Dependent Variable**	**Key Independent Variables**	**R^2**	**Spatial Dependence (ρ/λ)**	**Significance ($p < 0.05$)**	**Interpretation**
Spatial Lag Model	Industrial Output Growth	SEZ Density, Infrastructure Index	0.71	0.43	Yes	Strong positive spillover effect of SEZs on nearby districts
Spatial Error Model	Employment Growth	SEZ Presence, Urbanization Rate	0.68	0.37	Yes	Regional factors influence residual spatial autocorrelation
OLS (Non-spatial)	Industrial Output	SEZ Count, Population Density	0.54	–	Yes	Underestimates spatial dependency

Source: *Haryana Economic Survey (2020–21); HSIIDC Industrial Development Reports;* and *Ministry of Commerce & Industry (SEZ Division) Statistics (2001–2020).*

Table 5 summarizes the spatial econometric results used to quantify the relationship between SEZ concentration and regional economic performance. The Spatial Lag Model shows a high R^2 value (0.71) and significant spatial dependence ($\rho = 0.43$), confirming that SEZ density positively influences industrial output growth in adjacent districts through spatial spillovers. The Spatial Error Model, with $R^2 = 0.68$ and $\lambda = 0.37$, highlights that unobserved regional factors such as governance,

infrastructure quality, and institutional efficiency also affect employment growth. In contrast, the traditional OLS model, with a lower R^2 (0.54), fails to capture spatial dependencies, underestimating regional linkages. These results collectively validate that SEZs act as economic catalysts, generating inter-district externalities and reinforcing spatial clustering. However, the presence of residual spatial effects suggests that policy attention must also address institutional and infrastructural disparities to optimize the diffusion of SEZ benefits across Haryana's regional economy.

Conclusion

The study on the Growth, Distribution and Spatial Influence of Special Economic Zones (SEZs) in Haryana reveals a dynamic yet spatially uneven pattern of industrial development across the state. Over the past two decades, SEZs have emerged as powerful instruments for economic transformation, attracting significant investment, generating employment, and strengthening Haryana's position as a key industrial hub in northern India. The temporal analysis indicates that SEZ growth accelerated rapidly after the SEZ Act of 2005, with diversification from IT/ITES to multi-product and manufacturing sectors. However, spatial analysis highlights a strong concentration of SEZs in districts adjoining the National Capital Region, particularly Gurugram, Faridabad, Sonipat, and Jhajjar, where superior infrastructure, market access, and policy support created favourable industrial environments. Peripheral districts such as Hisar, Panipat, and Bhiwani, on the other hand, continue to lag behind, reflecting persistent regional disparities in industrial expansion. The spatial econometric results confirm positive spillover effects from SEZ clusters to neighbouring districts, especially in terms of employment, infrastructure, and urban growth, though these benefits diminish with distance from SEZ cores. The findings emphasize that SEZs act as regional growth poles, stimulating localized development but also deepening spatial inequalities. Therefore, a balanced policy approach is essential—one that integrates infrastructure development, capacity building, and rural-industrial linkages in underdeveloped regions. Expanding SEZ benefits through industrial corridors, agro-based zones, and inclusive spatial planning can ensure that Haryana's economic growth becomes more regionally equitable and sustainable. In conclusion, SEZs have significantly reshaped Haryana's economic geography, but achieving balanced spatial development requires strategic interventions that extend industrial prosperity beyond the state's established urban-industrial belt.

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