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EMERGING INDUSTRIAL CLUSTERS IN TIER-2 AND TIER-3 CITIES OF INDIA: A SPATIAL ANALYSIS OF NEW MANUFACTURING HUBS

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ABSTRACT :

India's manufacturing sector is witnessing a notable shift from traditional metropolitan centres toward Tier-2 and Tier-3 cities. This spatial redistribution of industrial activity has significant implications for regional development, employment, urbanisation, and infrastructure planning. Using a mixed-methods approach that combines spatial data analysis, policy review, and case studies of selected cities (Surat, Coimbatore, Ludhiana, Aurangabad, Bhubaneswar, and Rajkot), this paper examines the emergence of new manufacturing hubs outside India's metros. It explores drivers such as infrastructure investments, policy incentives, labour cost differentials, and cluster-based development programmes. The study also analyses socio-economic impacts, including job creation, urban growth, and regional disparities. While these clusters present opportunities for balanced growth and employment generation, challenges persist in infrastructure gaps, environmental management, and equitable development. The paper concludes with policy recommendations for fostering sustainable and inclusive industrialisation in India's non-metro geographies.

KEYWORDS : *Industrial clusters, Tier-2 cities, Tier-3 cities, manufacturing hubs, spatial analysis, regional development, India.*

1. INTRODUCTION

India's industrial landscape has historically been dominated by large metropolitan centres such as Mumbai, Delhi, Chennai, Bengaluru, and Kolkata. These mega-cities have long attracted manufacturing investment due to superior infrastructure, skilled labour pools, and established markets. However, over the past two decades, India has witnessed an increasing dispersion of manufacturing activity toward Tier-2 and Tier-3 cities.

This spatial shift is not incidental. It reflects a combination of policy initiatives (e.g., Make in India, Industrial Corridor programmes), cost pressures in metros, and targeted state-level incentives designed to promote balanced regional development. Emerging industrial clusters in these smaller cities are reshaping India's economic geography, creating new manufacturing hubs with local specialisations—from textiles and engineering to auto components, pharmaceuticals, and food processing.

The emergence of these clusters is significant for multiple reasons:

- **Regional Equity:** Reducing inter-state and intra-state economic disparities.
- **Employment Generation:** Creating local non-farm jobs in smaller urban centres.
- **Urbanisation Patterns:** Encouraging planned urban growth in smaller cities.
- **Infrastructure Development:** Stimulating investment in roads, power, logistics, and industrial parks beyond metros.

This paper undertakes a **spatial analysis** of these emerging manufacturing hubs, focusing on Tier-2 and Tier-3 cities in India. It examines the factors driving cluster emergence, analyses socio-economic impacts, and identifies policy and planning challenges. By doing so, it contributes to debates on India's industrial strategy, urbanisation policy, and regional development planning.

2. LITERATURE REVIEW

2.1 Industrial Clusters: Concept and Theory

Industrial clusters are geographic concentrations of interconnected firms, suppliers, service providers, and associated institutions in a particular field. Porter (1990) argues that clusters enhance competitiveness through economies of scale, knowledge spillovers, and shared infrastructure.

Marshallian cluster theory highlights:

- Specialised labour markets.
- Input-output linkages.
- Informal knowledge flows.
- Collective efficiency (Schmitz, 1995).

In developing countries, clusters can facilitate industrialisation by overcoming market failures (Nadvi & Schmitz, 1994).

2.2 Clusters and Regional Development in India

India has a long tradition of clustered production:

- Textiles in Surat, Tiruppur.
- Leather in Kanpur, Ambur.
- Handicrafts in Moradabad.
- Auto components in Pune, Chennai.

Government policy has recognised clusters as a development strategy:

- Small Industries Cluster Development Programme (SIDBI, UNIDO, DCMSME).
- Industrial Corridor projects (Delhi-Mumbai Industrial Corridor - DMIC).
- State-level initiatives (e.g., Tamil Nadu Industrial Policy, Gujarat Industrial Policy).
- Make in India (2014 onwards) emphasising dispersed manufacturing.

Clusters in Tier-2/3 cities are now central to India's goal of boosting manufacturing to 25% of GDP.

2.3 Spatial Dynamics of Manufacturing

Urban economists and geographers have long studied why industries locate where they do (Krugman, 1991; Fujita et al., 1999). Key factors include:

- Transportation costs and logistics.
- Agglomeration economies.
- Labour availability and cost.
- Policy incentives and infrastructure.

In India, high costs and congestion in metros have driven firms to cheaper, well-connected smaller cities. Industrial corridor development has also improved connectivity between metros and hinterland cities.

2.4 Research Gaps

While cluster studies in India are extensive (Das, 2005; UNIDO, 2006), most focus on traditional artisan clusters or established metro-based manufacturing hubs. There is less systematic analysis of:

- Newer industrial clusters in Tier-2 and Tier-3 cities.
- Their spatial distribution and drivers.
- Socio-economic impacts on smaller urban geographies.

This paper seeks to fill that gap with a spatially grounded analysis of emerging manufacturing hubs beyond India's major metros.

3. METHODOLOGY

3.1 Research Design

This research adopts a **mixed-methods approach**, combining:

- **Spatial analysis** of cluster emergence across India's urban hierarchy.
- **Case studies** of selected Tier-2 and Tier-3 city clusters.
- **Policy review** of central and state government industrial development strategies.

3.2 Data Sources

- Annual Survey of Industries (ASI), Government of India.
- MSME Ministry's cluster development reports.
- State Industrial Policies.
- Industrial corridor programme documentation.
- Remote sensing and GIS datasets for urban growth analysis.
- Census of India Urban Agglomerations.
- Academic and policy literature.

3.3 Definition of Tier-2 and Tier-3 Cities

While definitions vary, this study uses:

- **Tier-2 cities:** Urban centres with population between 1 million and 4 million.
- **Tier-3 cities:** Urban centres with population between 100,000 and 1 million.

Examples: Coimbatore, Surat (Tier-2); Rajkot, Aurangabad (Tier-3).

3.4 Case Study Selection

Six representative emerging manufacturing hubs were selected:

- **Surat (Gujarat):** Textiles, diamonds, engineering.
- **Coimbatore (Tamil Nadu):** Engineering, auto components, textiles.
- **Ludhiana (Punjab):** Hosiery, bicycles, machine tools.
- **Aurangabad (Maharashtra):** Auto components, pharmaceuticals.
- **Bhubaneswar (Odisha):** Engineering, IT-ITES, food processing.
- **Rajkot (Gujarat):** Engineering goods, casting, machine tools.

3.5 Analytical Framework

Key analytical dimensions:

- Drivers of cluster emergence.
- Spatial patterns of industrial growth.
- Employment and income impacts.
- Infrastructure development.
- Environmental and social challenges.
- Policy ecosystem and incentives.

4. ANALYSIS AND FINDINGS

4.1 Overview of Emerging Industrial Clusters in India

India's urban system is highly hierarchical. The largest metro cities have historically concentrated industrial investment, skilled labour, and infrastructure. However, new manufacturing clusters are increasingly emerging in Tier-2 and Tier-3 cities, partly due to:

- Saturation and high costs in metros.
- Infrastructure push via industrial corridors.
- State-level incentives to decentralise manufacturing.
- Access to cheaper land and labour.
- Growing internal markets in smaller cities.

Government programmes like the **Delhi-Mumbai Industrial Corridor (DMIC)**, **Chennai-Bengaluru Industrial Corridor**, and **Eastern Dedicated Freight Corridor** have specifically aimed to connect metros with industrial hubs in the hinterland.

The following case studies illustrate these dynamics in selected cities.

4.2 Surat (Gujarat)

4.2.1 Background

- Tier: 2
- Population: ~6 million urban agglomeration.
- Industrial specialisations: Textiles (synthetic fabrics), diamond polishing, engineering, chemicals.

4.2.2 Drivers of Cluster Growth

- Proximity to ports (Hazira, Nhava Sheva) for exports.
- Gujarat's investor-friendly policies.
- High-quality road and power infrastructure.
- Presence of Surat Diamond Bourse (world's largest office complex for diamond trade).
- Agglomeration economies in textile weaving and processing.

4.2.3 Socio-Economic Impacts

- Employment: ~800,000 workers in textiles alone.
- Migrant labour from Bihar, UP, Odisha.
- Income diversification: Large MSME base in engineering and chemicals.
- Urbanisation: Peripheral towns like Sachin and Palsana becoming industrial suburbs.
- Challenges:
  - Water pollution from dyeing units.
  - Housing and slum growth for migrant workers.

4.3 Coimbatore (Tamil Nadu)

4.3.1 Background

- Tier: 2
- Population: ~2 million.
- Known as "Manchester of South India" for textiles.
- Other sectors: Engineering, pumps, auto components, IT.

4.3.2 Drivers of Cluster Growth

- Long history of industrial entrepreneurship.
- Tamil Nadu's cluster development policies.
- Linkages with Tiruppur's knitwear cluster.
- Availability of skilled technical labour.

- Proximity to Chennai-Bengaluru Industrial Corridor.

4.3.3 Socio-Economic Impacts

- Employment: Hundreds of thousands in SMEs.
- Women's employment in textiles.
- Strong local supply chains in machine tools and castings.
- High rates of urban home ownership vs migrant dependency.
- Challenges:
  - Power shortages (historically).
  - Environmental management for dyeing units.

4.4 Ludhiana (Punjab)

4.4.1 Background

- Tier: 2
- Population: ~2 million.
- Major centre for hosiery, bicycles, auto parts, machine tools.

4.4.2 Drivers of Cluster Growth

- Historical industrial base from colonial era.
- Access to northern markets (Delhi NCR).
- Entrepreneurial small firm networks.
- Punjab's road connectivity.

4.4.3 Socio-Economic Impacts

- Employment: Over 500,000 in manufacturing.
- Dominated by SMEs and informal units.
- Strong export orientation in garments.
- Urban sprawl: Industrial sheds into peri-urban villages.
- Challenges:
  - Air pollution from small foundries.
  - Labour shortages due to out-migration of locals.

4.5 Aurangabad (Maharashtra)

4.5.1 Background

- Tier: 3
- Population: ~1.5 million.
- Industrial sectors: Auto components, pharmaceuticals, breweries.

4.5.2 Drivers of Cluster Growth

- MIDC (Maharashtra Industrial Development Corporation) estates since 1970s.
- Proximity to DMIC nodes.
- Lower land and labour costs vs Pune.
- Special incentives for Marathwada region (backward area designation).

4.5.3 Socio-Economic Impacts

- Auto giants (Bajaj, Siemens) set up plants.
- Employment: Tens of thousands in formal and informal sector.
- Boost to local service economy (housing, retail).
- Urbanisation: Shift from historic tourist centre to manufacturing hub.

- Challenges:
  - Water scarcity.
  - Skill mismatch with local workforce.

4.6 Bhubaneswar (Odisha)

4.6.1 Background

- Tier: 2
- Population: ~1.2 million.
- Industries: Engineering, IT-ITES, food processing.

4.6.2 Drivers of Cluster Growth

- Odisha Industrial Policy incentives.
- Connectivity via East Coast Railway and National Highways.
- Government push to make Bhubaneswar a Smart City.
- Proximity to Paradip Port.

4.6.3 Socio-Economic Impacts

- Growth of IT parks and engineering SEZs.
- Employment: Diversification beyond mining sector.
- Rise of formal jobs for educated youth.
- Urbanisation: Planned development of satellite towns.
- Challenges:
  - Need for large-scale industrial training.
  - Environmental vulnerability (cyclones, flooding).

4.7 Rajkot (Gujarat)

4.7.1 Background

- Tier: 3
- Population: ~1.8 million.
- Specialisations: Engineering goods, machine tools, casting.

4.7.2 Drivers of Cluster Growth

- Strong local entrepreneurial culture.
- Gujarat government's MSME incentives.
- Linkages with Saurashtra region's agriculture and ports.
- Low-cost manufacturing advantage vs metros.

4.7.3 Socio-Economic Impacts

- ~5000+ foundries and engineering units.
- Employment: Tens of thousands of skilled and semi-skilled workers.
- Significant exports of machine tools.
- Urban growth: Industrial zones in outskirts.
- Challenges:
  - Air and water pollution.
  - Infrastructure strain (power, roads).

4.8 Comparative Analysis Table

City	Tier	Main Sectors	Key Drivers	Main Challenges
Surat	2	Textiles, diamonds, chemicals	Ports, policy, infrastructure	Pollution, migrant housing
Coimbatore	2	Textiles, engineering, IT	Skilled labour, policy, corridors	Power, environmental regulation
Ludhiana	2	Hosiery, bicycles, machine tools	Historical base, road connectivity	Pollution, labour shortages
Aurangabad	3	Auto components, pharma	Industrial estates, DMIC, incentives	Water scarcity, skill gaps
Bhubaneswar	2	Engineering, IT, food processing	Ports, Smart City plan, policy	Cyclones, training needs
Rajkot	3	Engineering, machine tools	Entrepreneurial culture, MSME support	Pollution, infrastructure strain

4.9 Cross-Cutting Drivers

Analysis across cases reveals common drivers:

- **Infrastructure connectivity:** Ports, highways, freight corridors.
- **Cost differentials:** Land and labour cheaper than metros.
- **Policy incentives:** State-level subsidies, land banks, industrial parks.
- **Local entrepreneurship:** Historical industrial traditions in Coimbatore, Rajkot.
- **Market access:** Internal demand from growing urban India, export linkages.

4.10 Socio-Economic Impacts

- Employment generation in manufacturing and services.
- Urbanisation of small cities, development of industrial suburbs.
- Local income diversification beyond agriculture.
- Migration dynamics: Both attracting and supplying migrant labour.
- Challenges of environmental management and infrastructure stress.

5. DISCUSSION

5.1 Regional Development and Spatial Equity

The growth of industrial clusters in Tier-2 and Tier-3 cities represents a strategic opportunity for addressing India's long-standing regional disparities. Historically, economic activity has been concentrated in a few coastal and metropolitan regions. By fostering manufacturing hubs in smaller urban centres:

- Underdeveloped regions can integrate into national and global value chains.
- Economic opportunities can spread beyond megacities.
- Migration pressures on overloaded metros may be reduced.
- Balanced urbanisation patterns can emerge with better planning.

However, evidence suggests that while certain states (Gujarat, Tamil Nadu, Maharashtra) have successfully cultivated such clusters, others lag behind, perpetuating inter-state inequalities.

5.2 Employment and Labour Market Dynamics

Industrial clusters generate non-farm jobs essential for structural transformation. The case studies show:

- Large-scale employment in MSMEs and informal units.

- Opportunities for both skilled and semi-skilled workers.
- Women's participation in sectors like textiles.
- Rising demand for technical training and upskilling.

Yet challenges remain:

- Informal employment dominates many clusters, with poor wages and labour rights.
- Skill gaps constrain productivity and wage growth.
- Migration creates social tensions and urban housing challenges.

A coordinated approach to vocational training and labour standards is essential.

5.3 Urbanisation and Infrastructure

Emerging clusters drive rapid urbanisation in Tier-2 and Tier-3 cities. This can be both an opportunity and a threat:

Opportunities:

- Planned industrial suburbs can reduce slum growth.
- Investment in roads, power, water, housing, and sanitation.
- Strengthening local government finances via higher tax bases.

Challenges:

- Unplanned sprawl strains existing infrastructure.
- Poor coordination between industrial policy and urban planning.
- Environmental impacts (air and water pollution, waste management).

Integrated urban-industrial planning is vital to ensure sustainable growth.

5.4 Environmental Sustainability

All case studies revealed environmental externalities:

- Water-intensive industries depleting local resources.
- Air and water pollution from small-scale foundries, dyeing units.
- Inadequate waste management infrastructure.

Policy needs to internalise environmental costs via:

- Stronger regulation and enforcement.
- Incentives for cleaner production technologies.
- Support for common effluent treatment plants.
- Renewable energy adoption in industrial estates.

5.5 Policy Ecosystem

Central and state governments have deployed multiple instruments to foster cluster development:

- Industrial corridor projects (DMIC, CBIC).
- Industrial estates and parks with plug-and-play facilities.
- Capital subsidies, tax incentives.
- Skill development programmes.
- MSME cluster development schemes.

Yet the policy landscape is often fragmented:

- Multiple overlapping schemes with poor coordination.
- Uneven implementation across states.
- Limited capacity at local government levels.
- Slow land acquisition and environmental clearances.

5.6 Institutional Capacity

Successful clusters depend on strong local institutions:

- Industrial development corporations.
- City governments and planning bodies.
- Training centres and technical institutes.
- Business associations and chambers.
- Financial institutions supporting MSMEs.

Building institutional capacity in Tier-2 and Tier-3 cities is critical for:

- Coordinated infrastructure planning.
- Labour market development.
- Environmental management.
- Investment promotion.

6. POLICY RECOMMENDATIONS

Based on the findings, the paper suggests the following policy priorities:

6.1 Strengthen Infrastructure Connectivity

- Invest in last-mile logistics, highways, and rail to connect clusters to ports and major markets.
- Develop multi-modal logistics hubs in smaller cities.
- Expand reliable power, water, and digital infrastructure in industrial estates.

6.2 Foster Inclusive Industrial Growth

- Prioritise lagging states and regions in incentive schemes.
- Promote women's employment and entrepreneurship in clusters.
- Support MSMEs in upgrading technology and meeting environmental standards.
- Ensure fair labour practices and social protection for informal workers.

6.3 Enhance Skill Development

- Scale up technical and vocational education (ITI, polytechnics).
- Partner with industry for apprenticeship programmes.
- Focus on skills relevant to local cluster specialisations.
- Provide targeted training for women and disadvantaged groups.

6.4 Improve Policy Coordination

- Align central, state, and local industrial development plans.
- Streamline land acquisition and environmental approvals.
- Harmonise incentive schemes to avoid duplication and leakage.
- Build capacity in district industries centres and local governments.

6.5 Promote Sustainable Industrialisation

- Enforce environmental regulations effectively.
- Support common effluent treatment plants and solid waste management.
- Incentivise adoption of green technologies (solar power, energy efficiency).
- Integrate industrial planning with urban master plans.

6.6 Support Entrepreneurial Ecosystems

- Facilitate access to credit for MSMEs, especially in Tier-3 cities.
- Establish business incubators and cluster-level service centres.
- Promote e-commerce linkages for small manufacturers.
- Strengthen industry associations for collective problem-solving.

7. CONCLUSION

The spatial shift of manufacturing activity from India's metros to Tier-2 and Tier-3 cities represents a profound transformation in the country's industrial geography. Emerging industrial clusters in cities like Surat, Coimbatore, Ludhiana, Aurangabad, Bhubaneswar, and Rajkot highlight the potential for:

- Balanced regional development.
- Employment generation beyond agriculture.
- Diversification of urban growth.

However, this opportunity comes with challenges:

- Infrastructure gaps in smaller cities.
- Environmental sustainability concerns.
- Informal employment and social inclusion.
- Policy fragmentation and weak institutional capacity.

A holistic approach is needed—combining infrastructure investment, skill development, environmental regulation, and institutional strengthening—to ensure that India's new manufacturing hubs contribute to sustainable, inclusive, and regionally balanced development.

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