An Analysis of Regional Industrial Disparity in Uttar Pradesh

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Abstract:
This paper investigates the regional disparity of industrial development in Uttar Pradesh by comparing key indicators across four regions—Western, Central, Eastern, and Bundelkhand—for the years 2001 and 2023. The study employs data-driven analysis to evaluate industrial concentration, productivity, employability, infrastructure, and investment. Results reveal persistent inequalities, with Western Uttar Pradesh leading on all fronts, while Bundelkhand remains underdeveloped. The findings highlight the importance of region-specific policy interventions and infrastructure investments to ensure equitable industrial growth across the state.

Keywords: Industrial Development, Regional Disparity, Uttar Pradesh, Industrial Concentration, Productivity, Employability, Infrastructure, Investment

Introduction:
In the context of economic development, regional disparity is a phenomenon that poses significant challenges to the equitable progress and prosperity of nations. Nowhere is this more evident than in India, where vast geographical, social, and economic inequalities manifest across states and regions. Uttar Pradesh (UP), the most populous state in India, exemplifies this complexity, offering a mixed landscape of industrial development that highlights stark regional contrasts. Despite being a critical player in the national economy, Uttar Pradesh grapples with severe disparities in industrialization that can impact the livelihoods, opportunities, and overall quality of life for millions of its residents. This thesis aims to explore the intricate dynamics of regional disparity in industrial development in Uttar Pradesh, focusing specifically on the factors that not only contribute to but also perpetuate these inequalities.

The industrial landscape of Uttar Pradesh is far from homogeneous. While regions such as Ghaziabad, Noida, and Agra have emerged as industrial hubs, characterized by robust manufacturing units and service sectors, many other districts remain underdeveloped and reliant on agriculture. This uneven distribution of industrial activity raises critical questions about the myriad influences shaping these disparities. A comprehensive analysis reveals that factors such as infrastructural deficiencies, historical governance decisions, policy implementation, access to resources, and socio-economic conditions play a

pivotal role in the state's industrial dynamics.

Infrastructure is one of the foremost elements impacting industrial growth. Regions with well-established transport networks, reliable electricity supply, and modern communication systems have a significant edge over those lacking these basic facilities. In regions like Western UP, for example, the presence of better road networks and proximity to Delhi has facilitated quicker industrial growth compared to regions in Eastern UP, where infrastructure remains inadequate. This disparity not only affects industrial attraction but also limits local entrepreneurs' ability to establish and sustain businesses.

Equally important is the role of government policy in influencing regional industrial development. The Indian government, through various initiatives aimed at promoting "Make in India" and boosting local entrepreneurship, has made substantial investments in industrial sectors across the state. However, the effectiveness of these policies often hinges on local implementation capabilities, community engagement, and the alignment of initiatives with regional aspirations. In many cases, regions that do not fully engage with these policies or lack strategic planning at the local governance level find themselves at a disadvantage, further widening the industrial gap with more proactive areas.

The socio-economic factors present in different regions also crucially affect industrial development. Educational attainment, labor skill availability, gender dynamics, and the entrepreneurial climate all play vital roles in determining how effectively a region can leverage its resources for industrial success. For example, regions with higher literacy rates and better vocational training programs are more likely to experience industrial growth, as these factors correlate directly with the availability of a skilled workforce capable of meeting industries' demands. Conversely, socio-economic constraints can inhibit growth trajectories, entrenching cycles of poverty and unemployment, particularly among marginalized communities.

In light of the pressing need for sustainable and balanced regional development, this research aims to contribute substantively to the discourse on industrialization in Uttar Pradesh. By engaging in a detailed examination of the varying levels of industrialization, this thesis intends to identify and analyze the underlying causes of regional disparities. The implications of such insights extend beyond academic study; they are crucial for informing policymakers in crafting effective strategies that promote more equitable resource distribution and encourage inclusive growth across the state.

Moreover, this study stands at the intersection of industrial growth and sustainable development. As global awareness regarding environmental sustainability increases, the need for industrial practices that minimize ecological impact becomes imperative. Understanding how regions in Uttar Pradesh can balance industrialization with sustainable practices will not only promote economic equity but also ensure environmental stewardship. The analysis will advocate for innovative approaches that integrate eco-friendly technologies and practices into industrial processes, ultimately contributing to a sustainable growth model that can serve as a reference for other regions facing similar challenges.

The significance of investigating regional disparities extends beyond Uttar Pradesh; it resonates throughout India and emphasizes the necessity of addressing inequalities for cohesive national development. As a crucial contributor to India's economy, Uttar Pradesh's industrial trajectory reflects broader national challenges and opportunities. By fostering inclusive industrial growth, the state can play a significant role in the country's aspirations for holistic development that uplifts all its citizens, ensuring that growth and progress are not exclusive to certain regions but are shared equitably across the entire state.

In conclusion, this introduction sets the framework for a comprehensive exploration of the intricate dynamics of regional disparity in industrial development within Uttar Pradesh. Through meticulous analysis and engagement with various factors that contribute to these disparities, this thesis aspires to facilitate a deeper understanding of the challenges and opportunities for industrial growth in the state. The investigation aims not only to contribute to academic knowledge but also to influence policy considerations that can pave the way toward a more balanced and equitable industrial landscape in Uttar Pradesh, fostering a brighter and more sustainable future for all of its citizens.

Review of Literature:

Numerous studies have sought to elucidate the factors contributing to regional disparities in industrial development. Krugman (1991) introduces the concept of agglomeration economies, where the clustering of industries in specific regions leads to enhanced productivity and competitiveness. This phenomenon raises important questions about why regions such as Western UP have experienced significant industrial growth, while others, particularly in the eastern parts, have remained underdeveloped.

Chadha and Sharma (2018) further highlight the role of infrastructure in shaping industrial outcomes. Their research emphasizes the importance of transport networks, electricity supply, and technological access as crucial determinants of regional industrial performance. However, they note that infrastructure improvements alone are insufficient without accompanying policy measures that address local socio-economic conditions and governance structures.

The effectiveness of government policies in stimulating industrial growth has been a recurring theme in the literature. Majumdar (2019) analyzes various policy initiatives undertaken by the Government of Uttar Pradesh aimed at enhancing industrial competitiveness. The study finds that while initiatives such as the "Uttar Pradesh Industrial Investment Policy" have yielded positive outcomes in certain districts, their impact has been uneven due to variations in local governance and stakeholder engagement.

Sinha (2020) points out that successful implementation of policies require alignment with regional needs and the active participation of local communities. This highlights a critical gap in the existing literature: the need for more comprehensive studies that evaluate policy effectiveness through a participatory lens, considering the perspectives of various stakeholders involved in industrial development.

The literature indicates that socio-economic factors, including education levels, skill availability, and labor market dynamics, significantly influence industrial development. Reddy and Singh (2017) argue that regions with higher educational attainment and vocational training are better positioned for industrialization, as they can provide a skilled workforce that meets the demands of modern industries.

Additionally, Kumar et al. (2021) emphasize the importance of social capital and networks in facilitating industrial growth. Their research suggests that communal ties and local business networks can enhance collaboration and innovation, contributing to more sustained industrial development. However, more empirical research is needed to quantify these relationships and evaluate their impact within the context of Uttar Pradesh.

An emerging area of interest is the integration of sustainable practices in industrial development. Patel and Gupta (2022) investigate the challenges and opportunities for adopting green technologies in Uttar Pradesh's industrial sectors. They argue that while there is a growing recognition of the need for sustainability, many industries continue to prioritize short-term economic gains over long-term environmental considerations, highlighting a gap in the discourse surrounding eco-friendly industrialization.

Furthermore, the literature lacks comprehensive studies on how sustainable practices can be operationalized within the specific socio-economic fabric of Uttar Pradesh. This presents an opportunity for future research to explore how sustainable industrial development can lead to both economic growth and social equity.

Several economic theories have been employed to analyze regional industrial development, with varying implications for understanding disparities. The New Economic Geography (NEG) framework posited by Fujita, Krugman, and Venables (1999) emphasizes the importance of economies of scale and transportation costs. They argue that as firms cluster in particular regions, they benefit from reduced costs and increased market access, further attracting more industries to those areas. This theory is particularly relevant when analyzing regions such as Western UP, which have historically benefitted from proximity to major markets and established infrastructure.

Conversely, Tarver and Spencer (2016) highlight the relevance of the Structural Change Theory, which suggests that economies evolve through shifts in sectors that drive growth. They urge that regions must navigate through such transitions to avoid stagnation. In the context of Uttar Pradesh, where agriculture remains significantly influential, understanding how industrial sectors can emerge from agricultural bases is crucial for fostering balanced regional growth.

In summary, the review of literature reveals a rich tapestry of research examining regional disparities in industrial development, yet significant gaps remain, particularly in the context of Uttar Pradesh. The interplay between infrastructure, governance, socio-economic factors, and sustainability underscores the complexity of industrial growth. This study aims to build upon these existing findings by providing an in-depth analysis of these issues, with a specific focus on the unique dynamics of Uttar Pradesh. The insights derived from this research will contribute to a deeper understanding of how to achieve equitable industrial development that can benefit all regions of the state. It is quite clear that a need of study for analysation of disparity in industrial performance among regions of Uttar Pradesh.

Objective of the study:

- To examine spatial disparities in industrial development in Uttar Pradesh.
- To analyze the four parameters with eight key indicators- industrial concentration, productivity, employability, infrastructure and investment for industrial development in Uttar Pradesh.
- To suggest region-specific strategies for balanced industrial development of Uttar Pradesh.

Data source and Methodology of the study:

Area of the Study: The study considers region wise industrial performance of Uttar Pradesh on the basis of eight indicators. In this regard four regions- Eastern Region, Western Regions, Central Regon and Bundelkhand Region has been taken for analyzing the disparity of Industrial devolopment. - Eastern Region includes twenty eight districts; Western Regions comprises thirty districts, Central Regon and Bundelkhand Region have ten and seven districts respectively

Data Source: This study is mainly an Analytical and Descriptive in nature. The study is based upon the secondary data. Data has been collected from various sources i.e. **district wise development indicator**

Points of Time and Periods of Time: The study seeks to compare regional variation at the at four point of time for the duration 2000-01 to 2023- 24 for all taken variables.

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Parameter and Indicators: In order to find the industrial performance in various regions of Uttar Pradesh, 8 indicators have been taken. These indicators are as follows:

Parameter	Indicators
Industrial Concentration	No. of small scale industries per lakh population
	No. of industrial area per lakh population
Industrial production	Per capita gross value of industrial productuon in(Rs.
	Net value added per worker in register working factory('000Rs.)
Industrial Employment	No.of employee in registered working factory per lakh of population
	Average worker per registered working factory
Industrial Infrastructure	Per Capita Electricity Consumption(K.W.H.)
	Total lenth of pucca road per lakh population

Analysis and Discussion of the study

The analysis of industrial development of economic regions of Uttar Pradesh is as following:

Industrial Concentration and Regional Disparity

Table 1: No. of small scale industries per lakh population

S.No.	Region	2000-01	2011-12	2019-20	2022-23	2023-24
No. of small scale industries per lakh population						
1	Western Region	23.210	21.720	98.140	344.500	547.070
2	Central Region	16.800	14.900	74.860	287.860	415.170
3	Bundelkhand Region	24.340	14.900	40.470	204.100	372.260
4	Eastern Region	11.480	11.650	48.230	237.420	346.990
Mean		18.958	15.793	65.425	268.470	420.373
Standard Deviation		5.990	4.238	26.317	61.276	89.030
Coeffiecient of Variation		31.594	26.837	40.224	22.824	21.179

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)\

Figure 1: No. of small scale industries per lakh population
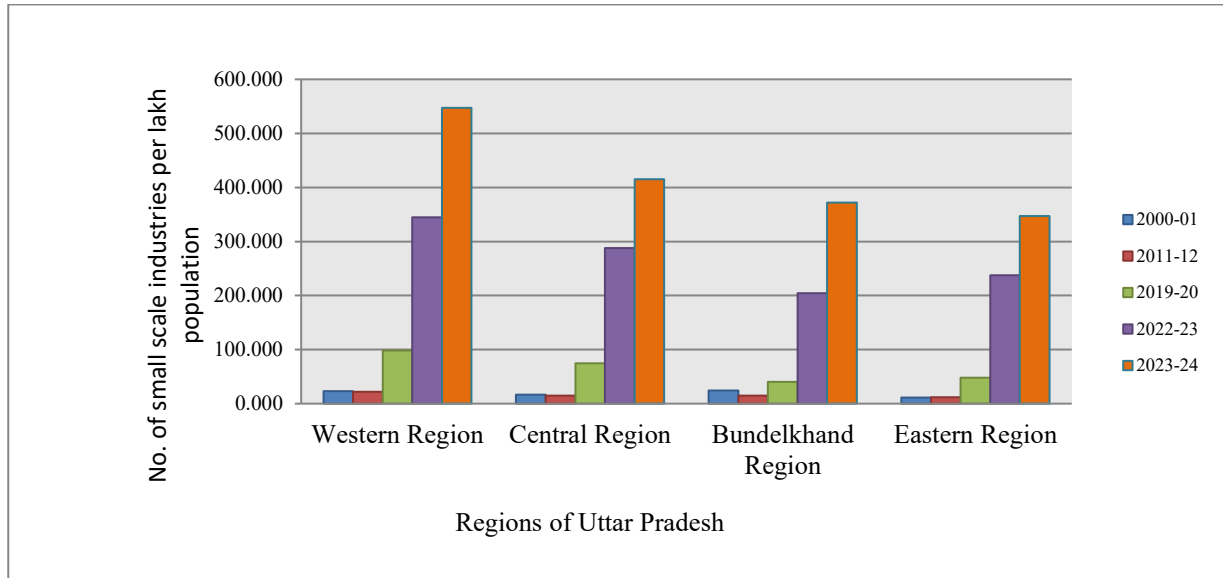
Source: Figure no 1 based upon Table no 1

Source: Figure no 1 based upon Table no 1

The number of small-scale industries per lakh population has significantly increased across all regions from 2000-01 to 2023-24. Initially, growth was uneven, with the Western region leading and others lagging. A dip or stagnation around 2011-12 was followed by a sharp rise from 2019-20 onward, especially in the Western and Central regions. By 2023-24, all regions showed strong growth, and regional disparities reduced, indicating more balanced and inclusive industrial development. The declining coefficient of variation highlights improved uniformity in industrial spread.

Trend Analysis (2000–2024)

General Trend:

There is a **sharp upward trend** in the number of SSIs across all regions from 2000-01 to 2023-24.

Year	Mean SSIs per lakh	Growth (compared to 2000-01)
2000-01	18.958	Base Year
2011-12	15.793	↓ ~17%
2019-20	65.425	↑ ~245%
2022-23	268.470	↑ ~1315%
2023-24	420.373	↑ ~2117%

Steady recovery 2011-12 shows a dip, possibly due to economic slowdown, policy shifts, or data limitations.Post-2011-12, there is exponential growth, especially from 2019-20 onward, likely reflecting targeted development schemes or enhanced entrepreneurial support.

Western Region has maintained leadership from 2000-01 onwards and grew by over 2300% since 2000-01.Eastern Regionhas been strong acceleration post-2011-12 suggests late but impactful development while as Bundelkhand Region had a high base in 2000-01 but dipped sharply in 2011-12.

| Year	Std. Deviation	Coefficient of Variation (%)	Interpretation
2000-01	5.99	31.59%	Moderate variation
2011-12	4.24	26.84%	Decreased variation
2019-20	26.32	40.22%	High variation (uneven regional development)
2022-23	61.28	22.82%	Variation increases in absolute terms but more uniform in relative terms
2023-24	89.03	21.18%	Highest standard deviation, but lowest CV — shows high values with improving uniformity

Though disparities in absolute terms increased, relative disparity is reducing (CV dropped from 40.22% in 2019-20 to 21.18% in 2023-24). This Indicates converging growth — previously lagging regions are catching up.

Table 2: No. of industrial area per lakh population

No. of industrial area per lakh population						
S.No.	Region	2000-01	2011-12	2019-20	2022-23	2023-24
1	Western Region	0.080	0.090	0.080	0.080	0.090
2	Central Region	0.110	0.110	0.120	0.110	0.080
3	Bundelkhand Region	0.130	0.110	0.090	0.090	0.120
4	Eastern Region	0.040	0.030	0.030	0.030	0.030
Mean		0.090	0.085	0.080	0.078	0.080
Standard Deviation		0.039	0.038	0.037	0.034	0.037
Coeffiecient of Variation		43.509	44.540	46.771	43.915	46.771

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 2: No. of industrial area per lakh population
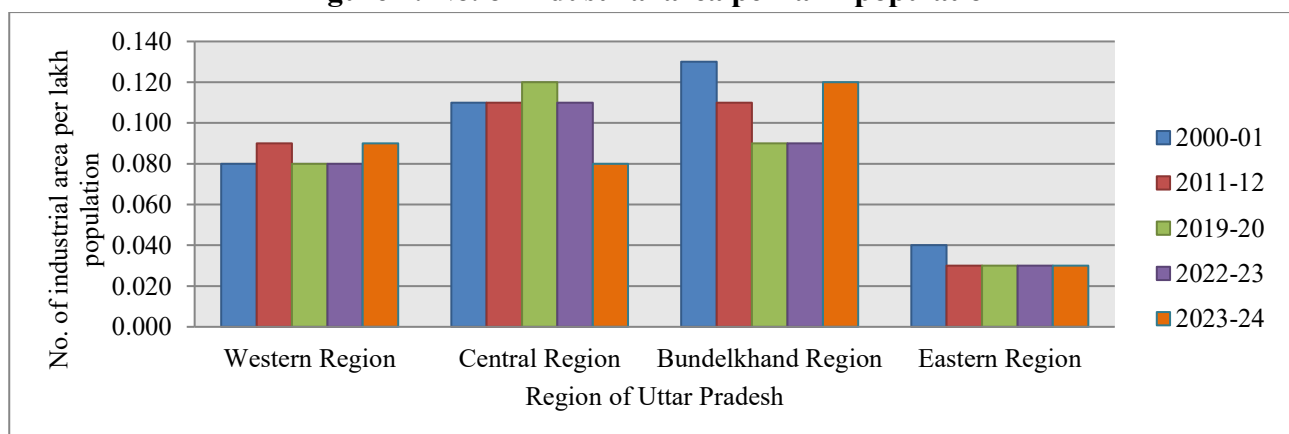
Source: Figure no 2 based upon Table no 2

Table no.2 show the number of industrial areas per lakh population has remained largely stagnant across all regions over the years, with only minor fluctuations. Despite overall growth in small-scale industries, the development of industrial areas has not kept pace. Most regions show little to no improvement since 2000-01, with the Eastern region consistently lagging behind. The mean values have slightly declined, indicating limited expansion. Moreover, the consistently high coefficient of variation reflects persistent regional disparity in industrial infrastructure. This suggests that while industrial activity may be increasing, the creation of dedicated industrial zones has not been a policy focus or has faced implementation challenges.
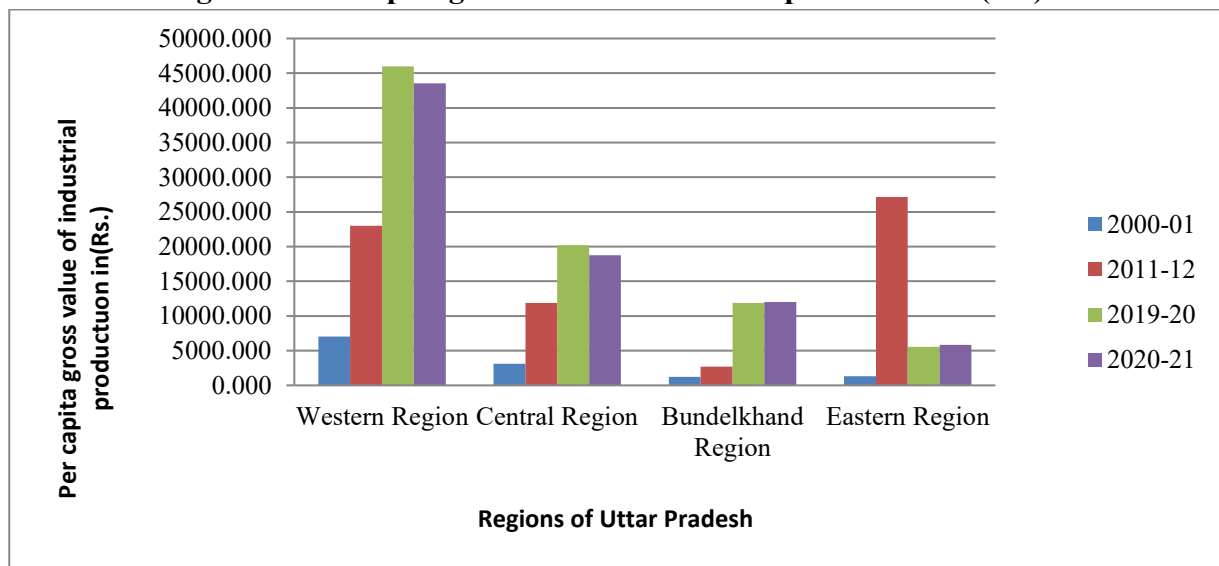
Industrial production and Regional Disparity:

Table 3: Per capita gross value of industrial productuon in(Rs.)

Per capita gross value of industrial productuon in(Rs.)					
S.No.	Region	2000-01	2011-12	2019-20	2020-21
1	Western Region	7042.050	23022.410	45976.030	43519.410
2	Central Region	3095.450	11880.950	20173.880	18745.530
3	Bundelkhand Region	1238.490	2679.970	11887.260	12041.800
4	Eastern Region	1323.970	27177.840	5581.650	5841.330
Mean		3174.990	16190.293	20904.705	20037.018
Standard Deviation		2716.418	11083.069	17750.265	16517.988
Coeffiecient of Variation		85.557	68.455	84.910	82.437

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 3: Per capita gross value of industrial productuon in(Rs.)

Source: Figure no 3 based upon Table no 3

Table 3 explains that per capita gross value of industrial production has shown overall growth from 2000-01 to 2019-20, but with notable regional disparities and recent fluctuations. The Western region consistently leads by a large margin, contributing significantly to the rising mean values. However, the

high and persistent coefficient of variation indicates substantial inequality across regions. While some areas like the Central region have seen steady improvement, others such as Bundelkhand and the Eastern region have experienced uneven progress. Notably, the Eastern region showed a sharp spike in 2011-12 followed by a steep decline, suggesting inconsistent industrial output. A slight drop in overall values in 2020-21 points to possible disruptions, likely due to economic slowdown or external shocks such as the pandemic. Overall, growth in industrial output remains uneven, with western dominance and limited gains in underdeveloped regions.

Table 4: Net value added per worker in register working factory('000Rs.)

Net value added per worker in register working factory('000Rs.)					
S.No.	Region	2000-01	2011-12	2019-20	2020-21
1	Western Region	411.980	31311.990	909.030	942.970
2	Central Region	408.050	56460.350	1092.100	1075.310
3	Bundelkhand Region	433.470	60953.990	3107.480	3114.070
4	Eastern Region	421.760	72969.250	999.930	977.130
Mean		418.815	55423.895	1527.135	1527.370
Standard Deviation		11.344	17520.270	1056.211	1059.286
Coeffiecient of Variation		2.709	31.611	69.163	69.354

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 4: Net value added per worker in register working factory('000Rs.)
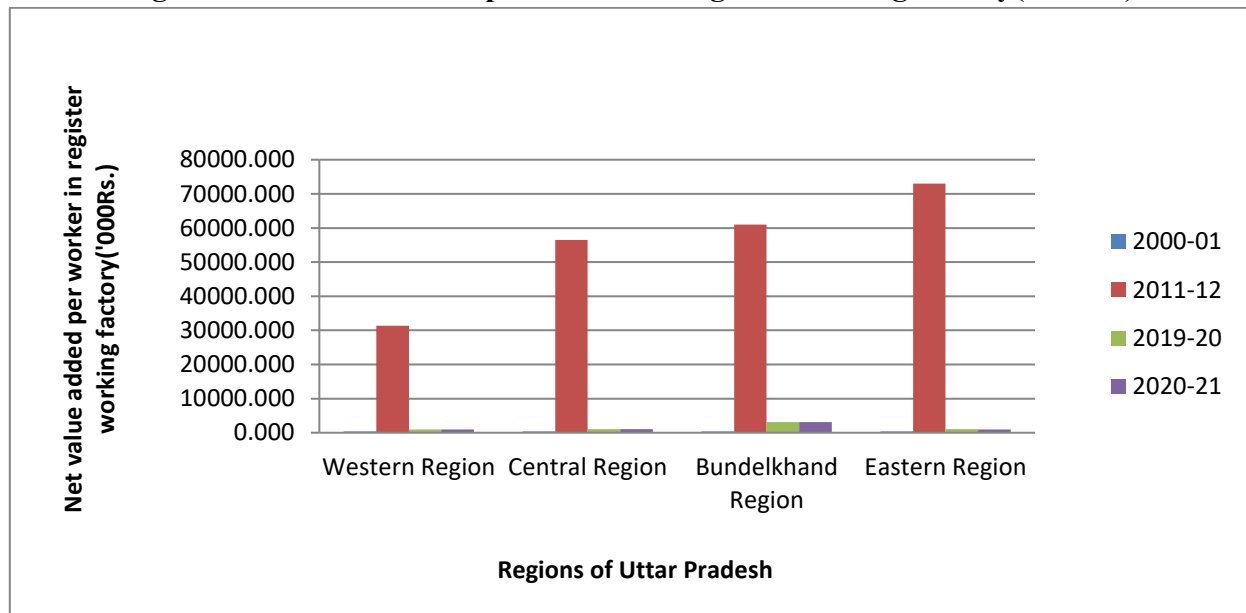
Source: Figure no 4 based upon Table no 4

Table 4 illustrates that the net value added per worker in registered working factories has seen dramatic fluctuations over the years. In 2011-12, all regions recorded unusually high values, possibly due to a reporting anomaly or exceptional economic conditions. However, by 2019-20 and 2020-21, the figures normalized, showing more realistic and modest contributions per worker. The Bundelkhand and Central

regions showed relatively better performance in recent years, while the Western and Eastern regions had lower values. The sharp increase in coefficient of variation from 2011-12 onward indicates rising inequality among regions in terms of worker productivity. Overall, while productivity improved slightly after 2000-01, regional disparities remain pronounced.

Table 5:No.of employee in registered working factory per lakh of population

No.of employee in registered working factory per lakh of population					
S.No.	Region	2000-01	2011-12	2019-20	2020-21
1	Western Region	388.910	770.720	835.720	783.920
2	Central Region	218.900	356.390	344.320	310.520
3	Bundelkhand Region	71.460	94.220	102.470	101.480
4	Eastern Region	103.870	90.200	85.970	108.780
Mean		195.785	327.883	342.120	326.175
Standard Deviation		143.453	320.421	349.614	320.169
Coeffiecient of Variation		73.271	97.724	102.191	98.159

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 5 :No.of employee in registered working factory per lakh of population
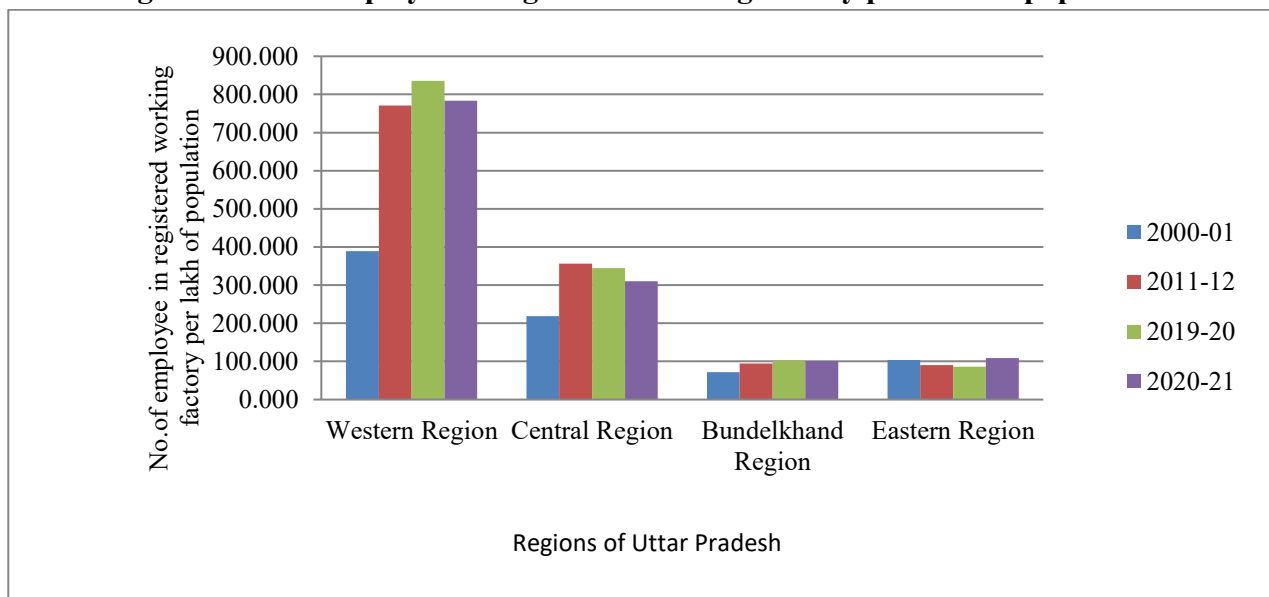
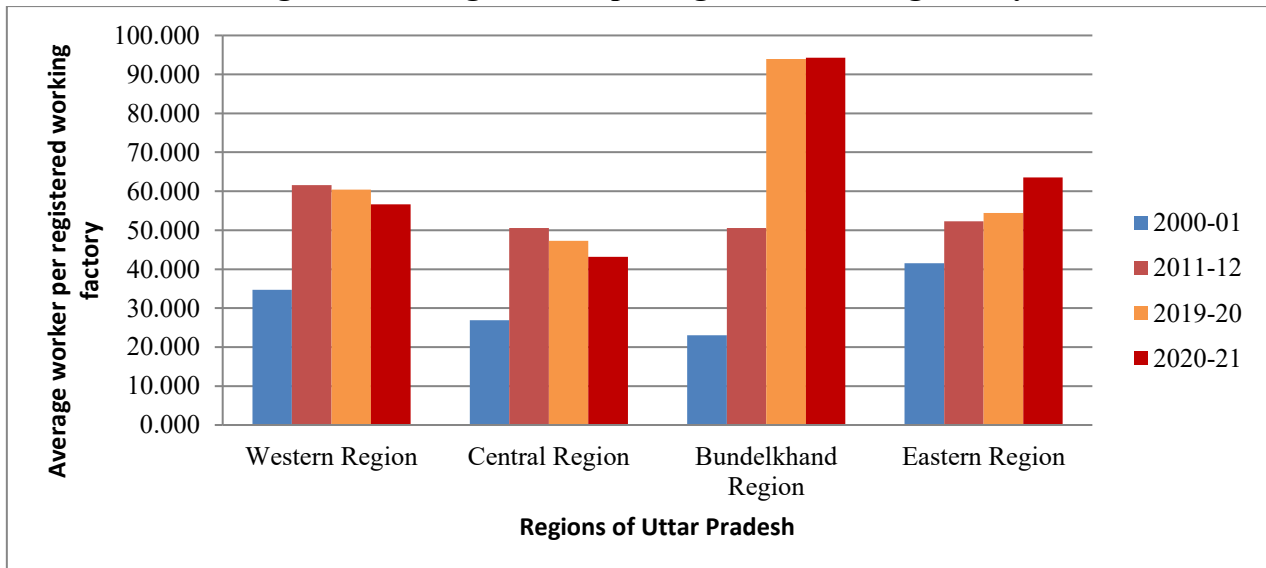Source: Figure no 5 based upon Table no 5

Table 5 explains that the number of employees in registered working factories per lakh population has generally increased over time but remains highly uneven across regions. The Western region consistently leads with significantly higher employment levels, while Bundelkhand and the Eastern region lag far behind. Although there was a rise in average employment by 2019-20, a slight decline occurred in 2020-21, possibly due to external disruptions like the pandemic. The persistently high coefficient of variation across all years indicates stark regional disparities in industrial employment, highlighting the concentration of job opportunities in specific regions and limited industrial workforce penetration in others.

Table 6: Average worker per registered working factory

Average worker per registered working factory					
S.No.	Region	2000-01	2011-12	2019-20	2020-21
1	Western Region	34.700	61.560	60.430	56.640
2	Central Region	26.900	50.560	47.270	43.190
3	Bundelkhand Region	23.020	50.560	93.990	94.320
4	Eastern Region	41.490	52.250	54.410	63.540
Mean		31.528	53.733	64.025	64.423
Standard Deviation		8.228	5.279	20.688	21.649
Coeffiecient of Variation		26.098	9.824	32.313	33.605

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 6: Average worker per registered working factory

Source: Figure no 6 based upon Table no 6

\Table 6 reveals that the average number of workers per registered working factory has increased over the years, indicating a trend toward larger factory sizes or greater workforce utilization. The Bundelkhand region showed a significant rise after 2011-12, surpassing other regions by 2019-20 and maintaining that lead. The Western and Central regions also saw growth, though more moderate. The Eastern region remained relatively stable but improved in the latest year. Despite overall gains, the rising coefficient of variation in recent years suggests increasing disparity among regions in factory workforce size, reflecting uneven industrial scaling across the state.

**Industrial Infrastructure and Regional Disparity**

Table 7: Per Capita Electricity Consumption(K.W.H.)

Per Capita Electricity Consumption(K.W.H.)						
S.No.	Region	2000-01	2011-12	2019-20	2022-23	2023-24
1	Western Region	186.260	325.500	553.100	620.950	639.260
2	Central Region	169.820	246.490	390.380	464.030	476.740

3	Bundelkhand Region	155.040	221.400	357.350	399.580	424.770
4	Eastern Region	169.050	221.400	269.310	320.220	334.770
Mean		170.043	253.698	392.535	451.195	468.885
Standard Deviation		12.769	49.308	118.614	127.541	127.831
Coeffiecient of Variation		7.509	19.436	30.218	28.267	27.263

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 7: Per Capita Electricity Consumption(K.W.H.)
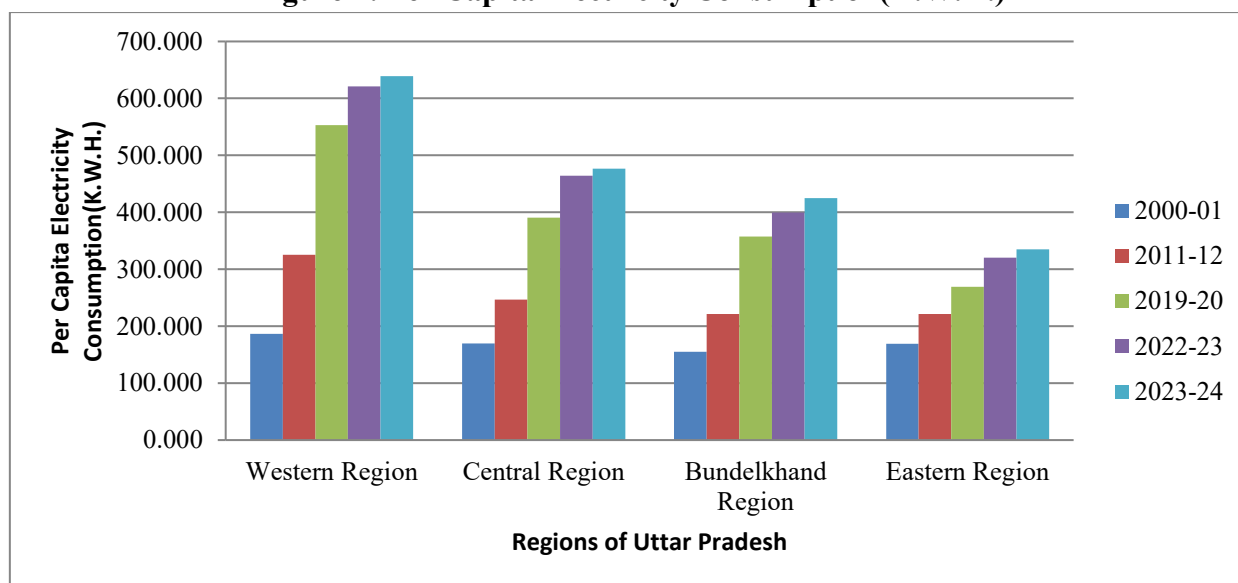
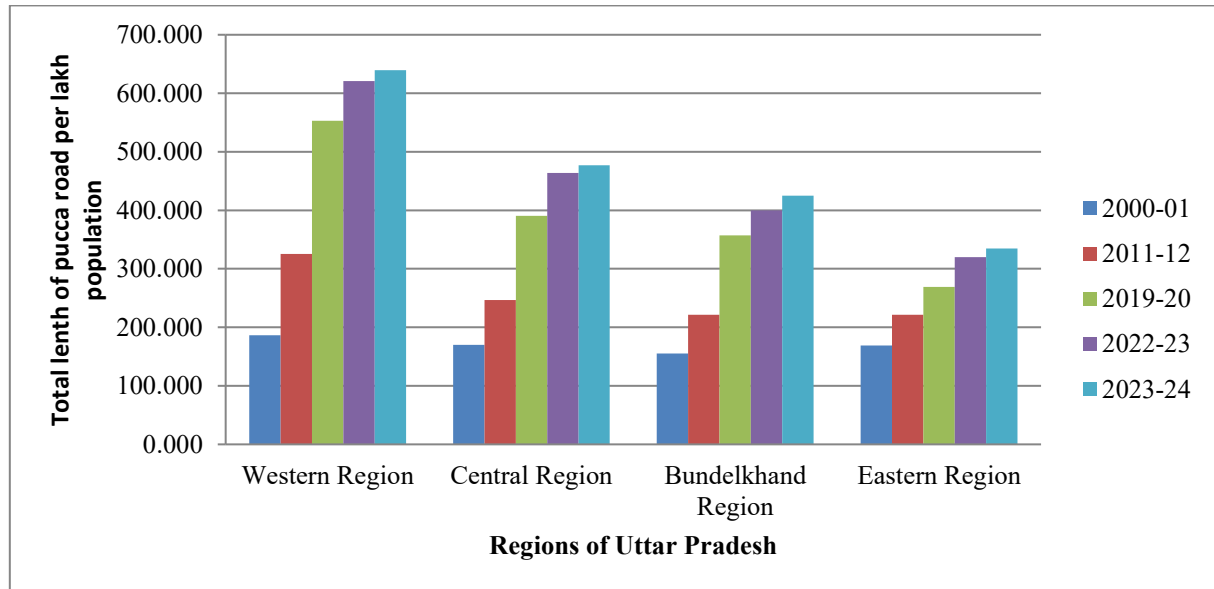**Source: Figure no 7 based upon Table no 7**

Per capita electricity consumption has steadily increased across all regions from 2000-01 to 2023-24, reflecting improved access to power and growing energy demand (Table 7). The Western region has consistently led in consumption, followed by the Central and Bundelkhand regions, while the Eastern region remains the lowest consumer. Despite overall growth, regional disparities have widened over time, as seen in the increasing standard deviation and coefficient of variation, especially after 2011-12. However, in recent years, the variation has slightly decreased, indicating a slow movement toward more balanced electricity access and usage across regions.

Table 8: Total lenth of pucca road per lakh population

Total lenth of pucca road per lakh population						
S.No.	Region	2000-01	2011-12	2018-19	2022-23	2023-24
1	Western Region	81.120	123.920	128.840	147.920	148.340
2	Central Region	91.270	115.080	143.010	143.660	144.420
3	Bundelkhand Region	112.290	136.680	188.660	188.070	190.960
4	Eastern Region	70.980	118.280	155.380	182.160	186.890
Mean		88.915	123.490	153.973	165.453	167.653
Standard Deviation		17.648	9.522	25.541	22.898	24.671
Coeffiecient of Variation		19.848	7.711	16.588	13.840	14.716

Source: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

Figure 8: Total lenth of pucca road per lakh population

Source: Figure no 8 based upon Table no 8

The total length of pucca roads per lakh population has steadily increased across all regions from 2000-01 to 2023-24, reflecting significant infrastructure development. Initially, the differences between regions were more pronounced, but over time, especially after 2011-12, road development became more balanced. Bundelkhand and the Eastern region showed the most notable improvements, surpassing others by 2023-24. The declining coefficient of variation indicates narrowing regional disparities, suggesting more equitable road infrastructure growth and improved connectivity across the state (Table 8).

Table 9: Performance Stability of Industrial Development in Regions

Coefficient of variance for all variables to measure the stability of industrial performance among regions of Uttar Pradesh , are given below in the Table 9 .This table shows

Coefficient of Variance among regions of Uttar Pradesh					
S.No.	Parameters	2000-01	2011-12	2018-19	2022-23	2023-24
1	No. of small scale industries per lakh population	31.594	26.837	40.224	22.824	21.179
2	No. of industrial area per lakh population	43.509	44.540	46.771	43.915	46.771
3	Per capita gross value of industrial productuon in(Rs.)	85.557	68.455	84.910	82.437	-
4	Net value added per worker in register	2.709	31.611	69.163	69.354	-

	working factory('000Rs.)					
5	No.of employee in registered working factory per lakh of population	73.271	97.724	102.191	98.159	-
6	Average worker per registered working factory	26.098	9.824	32.313	33.605	-
7	Per Capita Electricity Consumption(K.W.H.)	7.509	19.436	30.218	28.267	27.263
8	Total lenth of pucca road per lakh population	19.848	7.711	16.588	13.840	14.716

Sorce: Calculated by Author, data available on district wise development indicator (2000-01 to 2023-24)

The table 9 presents the coefficient of variance for various industrial and infrastructure parameters across regions of Uttar Pradesh from 2000-01 to 2023-24. It shows fluctuating trends in regional disparities. The number of small-scale industries per lakh population has generally declined, suggesting increased uniformity or reduced overall numbers. The industrial area per lakh population has remained relatively stable, with slight fluctuations, indicating persistent regional variation. The per capita gross industrial output and net value added per worker rose until 2022-23 but are missing for 2023-24. The number of employees in registered factories increased steadily, reflecting industrial growth. The average worker per factory saw a dramatic drop after 2000-01, suggesting restructuring or more uniform factory sizes. Electricity consumption per capita remained variable, while the length of pucca roads per lakh population has shown a consistent decline, pointing to growing disparity in road infrastructure development across regions. Overall, the data reflects both progress and persistent regional imbalances in industrial and infrastructural development.

Conclusion of the study:
The overall analysis of the data across all indicators reveals steady progress in industrial and infrastructure development over the past two decades, though with varying degree of regional disparity. Small-scale industries per lakh population have grown significantly, particularly after 2019-20, with a noticeable reduction in regional gaps. However, the development of industrial areas has remained stagnant, highlighting a mismatch between industrial growth and supporting infrastructure. Per capita industrial production has increased but remains uneven, with the Western region dominating and others lagging behind. Worker productivity and employment in registered factories also show growth but with persistent regional imbalances, as reflected in high variation. The average number of workers per factory has generally risen, particularly in Bundelkhand, indicating larger or more labor-intensive units. Electricity consumption has improved steadily across all regions, with a gradual decline in disparity, suggesting more uniform energy access. Road infrastructure has seen consistent expansion, especially in the Eastern and Bundelkhand region, and regional differences have narrowed over time. In summary,

while all regions have progressed, Western and Bundelkhand regions have made more significant strides in recent years, and efforts toward balanced regional development are gradually showing results.

Reference

1. Baliyan,SK (2016). "Economic growth and structural change of industrial sector in Uttar Pradesh." *Indian Journal of Economics and Development* 12 (4), 671-678, 2016

2. Jaiswal,A (2012). "The changing occupational structure and economic profile of textile industry of Banaras, Uttar Pradesh." *Journal of Social Sciences* 30 (1), 89-98, 2012

3. Kaur, K. Mishra, PK. (2017). "Socio-economic development of Uttar Pradesh: an empirical analysis." *Indian Journal of Economics and Development* 5, 8, 2017

4. Kaushal, P (2023). "An Assessment of Industrial Sector Efficiency of The State of Uttar Pradesh." *Knowledgeable Research: A Multidisciplinary Journal* 1 (06), 1-10, 2023

5. Khan, MR. Abdulla.(2019). "Dynamics of MSME industry in Uttar Pradesh and Maharashtra: an analysis of sugar firms." *SEDME (Small Enterprises Development, Management & Extension Journal)* 46 (4), 235-247, 2019.

6. Lal, A (2015). "Handloom Industry in Uttar Pradesh: Major Challenges and Prospects." *Dynamics of Public Administration* 32 (1), 31-46, 2015.

7. Mehta, GS (2012). "Agro-processing industry in Uttar Pradesh." *Planning Commission Government of India: New Delhi*, 2012

8. Pandey, V. (2013). "Trends, opportunities & challenges in small scale and cottage industries in Uttar Pradesh." *Asian Journal of Technology & Management Research* 3 (02), 2013.

9. Rasul, G. Sharma, E.(2014). "Understanding the poor economic performance of Bihar and Uttar Pradesh, India: a macro-perspective." *Regional Studies, Regional Science* 1 (1), 221-239, 2014.

10. Singh, SP. Agarwal, S(2006). "Total factor productivity growth, technical progress and efficiency change in sugar industry of Uttar Pradesh." *The Indian Economic Journal*, 54 (2), 59-82, 2006