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Recent trends of Industrialisation on its Impact of Economic, Environment and Human Health : A Case Study of Kharagpur City and Adjoining Area

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Abstract:

Kharagpur, a key industrial hub in West Bengal, has witnessed significant industrialization over the years, driven by its strategic location, railway connectivity, and proximity to major urban centers. This study explores the effects of industrialization on the economic environment and human health in the region. The rapid expansion of industries, including manufacturing, steel production, and small-scale enterprises, has contributed to economic growth, job creation, and infrastructure development. However, industrial activities have also led to environmental degradation, including air and water pollution, soil contamination, and deforestation. Spatio-temporal demarcation of industrial area and assessment of their impact on the environment are still a challenging tasks. Industrial expansion is identified as one of the major stressors to the environment. The results provide a baseline to evaluate future environmental impacts of industrial expansion in the region. This study may help environmentalists, industrial planners, and policymakers to plan regional industrial development and modify the existing policies accordingly for the improvement of the environment quality and better management practices for a sustainable future.

Keywords: *Industrialisation, Environmental Effects, Economic Effect, Impact of Human Health.*

Introduction:

Kharagpur, a significant industrial town in West Bengal, India, has evolved as a key hub for industrialization due to its strategic location, railway infrastructure, and academic ecosystem. Over the years, Kharagpur has witnessed industrial expansion, influenced by both traditional manufacturing industries and modern research-driven enterprises. The foundation of Kharagpur's industrialization was laid during the British colonial period with the establishment of the Kharagpur Railway Workshop (1904)—one of India's largest railway workshops. This led to the development of supporting industries in metal fabrication, locomotive repair, and engineering services. Over time, industrial growth expanded to include steel processing, manufacturing, and small-scale industries that cater to both regional and national markets.

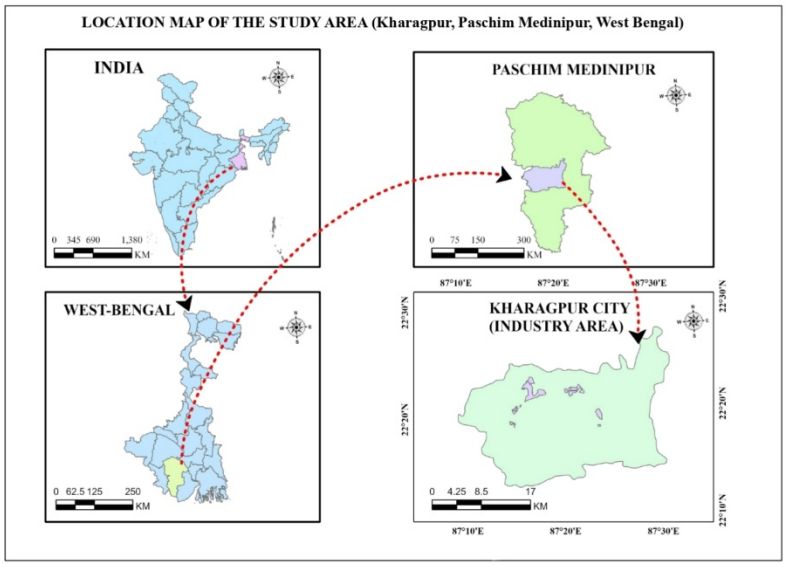
Objectives:

The present study will be based on following objectives.

- To study the development of Industrialization.
- To study the air pollution in Kharagpur city.
- To study the impact of industrialization in Kharagpur city.
- To study the impact of human health.
- To make people aware about the impact ofindustrialization on the environment.
- To find out the problem and suggestion of the study area.

Location of the study area:

Kharagpur is located in the paschimMedinipur district of West Bengal India. It lies in the south western part of the state, near the border with Odisha and Jharkhand. It geographical extension is 22.346°N (latitude) and 87.231°E(longitude).Total area of the kharagpur is 313.31 km2 (120.97 sq mi) and elevation is 62 m (203 ft) above the mean Sea level.



Research Methodology:

The whole research work was done through qualitative and quantitative methods. For the purpose of study, a field survey has been conducted in West Bengal of kharagpur city and adjoining areas. Primary will be collected from Gokulpur (West Bengal, paschimMedinipur) industrial area. Apart from Primary data, Secondary and documented data has been collected through various sources will be analyzed accordingly. In order to make the study more meaningful and viable, available literature and studies have been consulted and reviewed accordingly to add to the quality of work.

Discussion:

Impact of Industrialization on Economic Environment and Human Health in Kharagpur City

A) Economic Impact:

Industrialization has played a crucial role in Kharagpur's economic development, contributing to:

i) Employment Generation: Major industries like Tata Metaliks, Tata Bearings, Siemens, and Vidyasagar Industrial Park provide direct and indirect employment to thousands of workers.

ii) Urbanization and Infrastructure Growth: The city has witnessed improved transportation, housing, and commercial infrastructure due to industrial expansion.

iii) Boost to Local Businesses: The presence of industries has increased demand for local services, such as retail, healthcare, and education.

iv) Revenue Generation: Industrial operations contribute significantly to state and local government revenues through taxes and duties.

However, challenges like job insecurity due to automation, labor exploitation, and uneven economic benefits persist.

B) Environmental Impact:

Industrialization has also led to significant environmental concerns:

i**) Air Pollution:** High emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate matter from factories contribute to respiratory diseases and poor air quality.

ii) Water Pollution: Discharge of industrial effluents into rivers and local water bodies contaminates drinking water sources and affects aquatic life.

iii) Deforestation and Land Degradation: Expansion of industries leads to loss of green cover, soil erosion, and increased urban heat.

iv) Waste Management Issues: Improper disposal of industrial waste leads to toxic accumulation in soil and groundwater.

C) Health Impact:

The industrial boom in Kharagpur has led to several public health concerns:

i) Respiratory Diseases: Increased air pollution contributes to asthma, bronchitis, and other lung infections.

ii) Waterborne Diseases: Contaminated water sources lead to gastrointestinal infections and skin diseases.

iii) Occupational Hazards: Factory workers are often exposed to hazardous chemicals, leading to chronic illnesses and workplace accidents.

iv) Noise Pollution: Constant industrial noise can cause stress, hypertension, and hearing impairments among residents.

The adverse impact on human health is evident in the rising cases of respiratory disorders, waterborne diseases, and occupational hazards among industrial workers. Air pollution from factories and vehicular emissions contributes to poor air quality, while industrial effluents affect water bodies and agriculture. The study highlights the need for sustainable industrial practices, stringent environmental regulations, and better urban planning to mitigate these effects. Balancing economic growth with environmental sustainability is essential for ensuring long-term development in Kharagpur and its surrounding areas.

Major problems and findings:

The industrialization of Kharagpur, a key industrial hub in West Bengal, has presented both challenges and developments. Here are the major problems and findings:

Major Problems:

1. Land Acquisition Issues: Large-scale acquisition of farmland for industrial projects has displaced local farmers and affected agriculture. Protests and disputes over compensation and rehabilitation have emerged.

2. Labor and Political Conflicts: Political interference and conflicts among labor unions have led to frequent strikes and disruptions. The unstable labor environment has affected industrial productivity.

3. Environmental Concerns: Industrial pollution, especially from steel and manufacturing plants, has led to air and water contamination. Deforestation and land degradation due to rapid industrial expansion.

4. Decline in Traditional Manufacturing: The share of the manufacturing sector in West Bengal's economy has declined over the years. Shift towards small-scale and unorganized industries, leading to job insecurity.

5. Infrastructure and Connectivity Issues: Inadequate roads, power supply, and logistics infrastructure have hindered industrial growth. Need for better rail and highway connectivity to support large-scale industries.

Major Findings and Developments:

1. Growth of Industrial Parks: Establishment of the Kharagpur General Industrial Park to attract industries, especially in steel and allied sectors.

2. Environmental Improvements: Studies show a decline in sulfur dioxide (SO_2) levels due to stricter pollution control measures.

3. Focus on MSMEs and Digitalization: Post-pandemic efforts have emphasized supporting Micro, Small, and Medium Enterprises (MSMEs). Adoption of Industry 4.0 technologies to enhance industrial efficiency. Despite challenges, Kharagpur remains an important industrial hub with ongoing initiatives for sustainable growth and modernization.

Conclusion:

While industrialization has significantly boosted Kharagpur's economy, it has also created environmental and health challenges. To sustain long-term growth, a balanced approach is needed, focusing on sustainable industrial practices, stricter pollution controls, and better healthcare facilities for affected populations.

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