Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-10 | October-2025 | Page 23-29

Impact of Industrialisation on Agricultural Development in Raigarh District

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Abstract

The rapid expansion of industrial activity in Raigarh district of Chhattisgarh has reshaped the socio-economic environment of the region, influencing agriculture in multiple ways. This study evaluates the implications of industrialisation on agricultural development by analysing evidence from a field survey conducted among 150 farming households, interviews with key local stakeholders, and secondary data from government sources. The findings show a dual reality: while industries have generated new employment opportunities and helped households diversify income, they have also led to significant reductions in farmland, intensified pressure on water resources, and created concerns over pollution and environmental degradation. Changing cropping patterns, labour availability, and irrigation practices reflect the profound transformation underway in rural Raigarh. The study concludes with policy measures aimed at balancing industrial growth with long-term agricultural sustainability.

Keywords: Industrialisation, Agriculture, Land transformation, Water scarcity, Livelihood shifts, Raigarh District

Introduction

Industrialisation has emerged as a significant engine of economic progress in developing regions, but its consequences are not uniform across sectors. In agricultural regions, especially those dependent on small and marginal farming, large-scale industrial development often intersects with rural livelihoods in complex ways. Raigarh district—a mineral-rich region in eastern Chhattisgarh—has become a major hub for steel, power, and mining industries over the past two decades. This transformation has brought infrastructural growth, non-farm employment, and new market linkages. At the same time, it has altered land-use patterns, increased competition for natural resources, and introduced environmental challenges that directly affect agriculture, the primary livelihood for a majority of rural households.

The present paper investigates how industrialisation has reshaped agriculture in Raigarh. By integrating survey data with secondary information and qualitative insights, the study provides a comprehensive

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understanding of how farming communities are coping with, adapting to, and being influenced by ongoing industrial expansion.

Objectives

1. To analyse the extent of land-use changes caused by the expansion of industries in Raigarh district.
2. To evaluate how industrialisation has affected farm incomes, cropping patterns, and agricultural practices.
3. To understand the implications of industrialisation for water availability and irrigation systems.
4. To examine livelihood diversification, migration, and shifts in labour markets triggered by industrial growth.
5. To suggest policy directions that promote a balanced relationship between industrial development and agricultural sustainability.

Methodology

A mixed-methods framework was adopted to capture both the quantitative and qualitative dimensions of the study:

1. Primary Household Survey

A structured survey was administered to **150 farming households** selected from regions with different levels of industrial exposure:

- Villages located within 5 km of industrial areas
- Villages situated between 5–15 km (peri-industrial belt)
- Villages located beyond 15 km (less industrial influence)

The survey collected information on landholding changes, farm and non-farm income, cropping patterns, irrigation, input use, labour dependence, and perceptions of environmental changes.

2. Key Informant Interviews (KIIs)

In-depth interviews were conducted with agricultural officers, panchayat leaders, NGO representatives, and CSR personnel from industries. These interviews helped contextualise quantitative findings and understand institutional responses.

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3. Secondary Data

Government publications, including district statistical records, industrial reports, groundwater assessments, and environmental documents, were used to supplement primary findings and provide a broader regional context.

4. Analysis

Quantitative data from surveys were summarised using descriptive statistical methods. Qualitative insights from KIIs were coded and integrated to support interpretation.

Tables

Table 1. Land-use Change and Exposure to Industrial Influence (n = 150)

Exposure Category	**Households (n)**	**Avg. Landholding Before Industry (ha)**	**Land Lost (ha)**	**% Reporting Land Loss**
Within 5 km	50	3.2	0.9	64%
5–15 km	50	2.8	0.3	28%
Beyond 15 km	50	3.5	0.05	6%
Overall Average	**150**	**3.17**	**0.42**	**32.7%**

Table

Changes in Agricultural Income, Labour, and Cropping Patterns

Indicator	**Before Industrialisation**	**After Industrialisation**	**Change**
Annual farm income (INR/household)	86,000	74,000	–14%
Annual non-farm income (INR)	18,000	62,000	+244%
Area under paddy (%)	68%	54%	–14 pp

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Area under cash crops (%)	12%	22%	+10 pp
Households hiring farm labour (%)	38%	30%	–8 pp
Households with migrant workers (%)	12%	36%	+24 pp

Discussion

1. Land Conversion and Changes in Tenure

Industrial expansion has resulted in significant land acquisition for steel plants, power projects, mining fields, and associated infrastructure. Villages closer to industrial areas experienced the highest land loss, as reflected in Table 1. Many farmers sold or surrendered land due to compulsory acquisition, financial pressure, or expectations of higher compensation. However, the long-term economic security offered by such compensation was limited, especially for households dependent on agriculture.

Fragmentation of the remaining land reduced agricultural efficiency. The uncertainty created by land conversion discouraged investments in soil improvement, irrigation, and long-term farming practices.

2. Shifts in Labour Markets and Livelihood Diversification

Industrialisation has altered the employment landscape of Raigarh. With the emergence of factories and mines, wage employment opportunities increased. A notable rise in non-farm income (+244%) indicates that many households diversified income sources. Young members often preferred industrial or contractual jobs over farming, leading to increased migration within and outside the district.

This shift also affected the local labour market. Farmers reported difficulty hiring labour during peak seasons, causing delays in field operations and a push toward mechanisation.

3. Transformation in Cropping Patterns and Farm Productivity

Water-intensive crops like paddy saw a decline in area, particularly in peri-industrial zones where groundwater levels dropped due to industrial extraction. Farmers increasingly turned to short-duration or cash crops such as vegetables and maize, which involved relatively lower water requirements and promised faster returns.

Despite diversification, many households—especially those who lost land—reported lower overall farm income. This suggests that cropping adjustments alone could not offset the impact of shrinking agricultural land and rising production risks.

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4. Water Scarcity, Groundwater Stress, and Environmental Concerns

Groundwater studies from the district reveal inconsistent water quality and increasing pressure on aquifers. Excessive withdrawal by industries and deforestation associated with mining have contributed to declining water tables. Farmers in survey villages expressed concern over the rising cost of irrigation and reduced water availability during dry months.Participants from KIIs also highlighted local protests relating to large-scale deforestation and land diversion for mines, reflecting widespread anxiety about ecological sustainability.

5. Environmental Externalities and Health Implications

Industrial emissions, particulate matter from mining, and improper disposal of effluents pose risks to both agriculture and human health. Dust deposition on crops, changes in soil structure, and concerns about contamination were frequently mentioned by farmers living near industrial zones. Some respondents linked increased respiratory ailments to industrial pollution, although further medical studies are needed to verify this.

6. Institutional Measures, Compensation, and Challenges

While the district administration and industrial CSR units have initiated skill development programs and community welfare activities, gaps remain. Compensation related to land acquisition was often viewed as inadequate or delayed. A lack of transparent grievance redressal mechanisms further complicated relationships between communities and industries. Farmers stressed the need for long-term livelihood support rather than one-time compensation.

Results

- Nearly one-third of sampled households reported losing part of their agricultural land to industrial or non-agricultural uses.
- Farm income declined in many households, especially those affected by land loss or water scarcity.
- Non-farm income rose sharply due to increased industrial employment and migration opportunities.
- Water scarcity and rising irrigation costs became major constraints for farming, particularly in peri-industrial areas.
- Localised environmental issues, including deforestation and pollution, contributed to community grievances and protests.

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Conclusion

Industrialisation in Raigarh has created new economic opportunities, but it has also placed considerable pressure on agriculture, natural resources, and rural livelihoods. A balanced development strategy is necessary to ensure that agricultural communities are not adversely affected by industrial expansion.

Policy Suggestions

1. Comprehensive Land-Use Planning:rotect productive agricultural zones and regulate the expansion of industrial corridors.
2. Fair and Transparent Compensation:Compensation must include long-term livelihood support, capacity building, and financial planning assistance.
3. Water Resource Governance:Strict monitoring of groundwater extraction and implementation of water-recharge infrastructure are essential.
4. Support for Climate-Smart and Sustainable Agriculture: Encourage micro-irrigation, soil health improvement, and high-value crop cultivation.
5. Strengthening Environmental Safeguards:Transparent monitoring of emissions, deforestation, and effluent management must be prioritised. Community participation should be ensured at all stages of project planning.
6. Robust Livelihood Transition Programs:Skill development, credit access, and entrepreneurship support can help farming families diversify their livelihoods without being forced out of agriculture.

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