

AMOGHVARTA

ISSN : 2583-3189



Causes of Major Agriculture Challenges in Jharkhand : A Geographical Analysis

ORIGINAL ARTICLE



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Abstract

Agriculture is the main source of livelihood in the study area. Agriculture in Jharkhand serves as the backbone of its rural economy. This research paper aims to know the Causes of major Agriculture challenge. This research paper question what are the Causes of major Agriculture challenge in Jharkhand? In order to complete this research paper, the use of primary and secondary data and descriptive and analytical method have been done. Major Causes agriculture challenges Unplugged Furrows, Irrigation Deficit, Soil Story: Acidity, Erosion, and Low Fertility, Small-Scale Hurdles, Socio-economic Factors, An Amplifying Threat. It is direct impact can be observed on changing agricultural practices for this the Government is running mahila Kisan sasktikaran pariyojna and Mukhyamantri mayya samman yojana, mukhyamantri krishi ashirwad yojna.

Key Words

Unplugged Furrows, Irrigation Deficit, Challenging Soil: Acidity, Erosion, Low Fertility, Crop Diversification.

Introduction

Agriculture in Jharkhand serves as the backbone of its rural economy, despite the state being renowned for its rich mineral resources. Carved out of Bihar in 2000, Jharkhand's agricultural profile is distinctly shaped by its unique geographical features, climate, and historical context.

Here's an introduction to agriculture in Jharkhand:

- 1. A Predominantly Rural and Agrarian Economy:** A significant majority of Jharkhand's population resides in rural areas, with over 75-80% directly or indirectly dependent on agriculture and allied activities for their livelihoods. This sector is the primary source of employment and income for a large segment of the state's workforce. However, its contribution to the Gross State Value Added (GSVA) is relatively modest, typically ranging from 13-16%, indicating low productivity per worker compared to other sectors.
- 2. Heavily Rain-fed with Limited Irrigation:** The defining characteristic of Jharkhand's agriculture is its overwhelming reliance on the monsoon. Approximately 90-92% of the cultivated land is rain-fed, making the Kharif (monsoon) season the primary cropping period. While the state receives substantial

annual rainfall (around 1300 mm), its erratic distribution, often concentrated in short bursts, leads to frequent challenges like droughts during dry spells and floods during intense downpours. The irrigation infrastructure is severely underdeveloped, with only about 12-13% of the net sown area currently irrigated, posing a major constraint on increasing cropping intensity and ensuring stable yields.

- 3. Dominance of Food Crops, Especially Rice:** Rice (Paddy) is the staple crop and dominates the agricultural landscape during the Kharif season, covering a significant portion of the gross cropped area. Other major food crops include Maize and Wheat, grown predominantly in Kharif and Rabi (winter) seasons respectively, along with various pulses (like Arhar, Urad, Moong, Gram) and oilseeds (Mustard, Niger). While there's a historical emphasis on cereal cultivation, there's a gradual shift towards high-value horticultural crops.
- 4. Unique Topography and Soil Challenges:** Jharkhand's undulating terrain, characterized by hills, plateaus (like the Chota Nagpur Plateau), and valleys, significantly influences agricultural practices. The soils are predominantly red lateritic soils, often acidic, low in organic matter, and deficient in key nutrients like phosphorus, sulfur, and boron. Soil erosion due to heavy rainfall on sloped lands is a persistent problem, further degrading soil fertility and impacting productivity.
- 5. Small and Fragmented Landholdings:** The agricultural landscape is largely characterized by small and marginal farmers with fragmented landholdings. This structure often hinders the adoption of modern farming techniques, mechanization, and efficient resource management, contributing to lower overall productivity.
- 6. Opportunities for Diversification:** Despite the challenges, Jharkhand possesses significant potential for agricultural growth, particularly in horticulture, forestry, and allied sectors. The state's diverse agro-climatic zones are suitable for cultivating a variety of fruits (mango, guava, banana), vegetables (potato, tomato, onion), and minor forest produce, including medicinal plants. The state is notably a significant producer of Lac. Efforts are underway to promote crop diversification and sustainable farming practices to enhance farmer incomes and agricultural resilience.

In essence, agriculture in Jharkhand is a critical sector for livelihoods, profoundly influenced by its rain-fed nature, challenging terrain, and the socio-economic conditions of its farming communities. While productivity has historically been low, ongoing Government initiatives and a growing focus on diversification aim to transform this sector into a more vibrant and sustainable engine of rural development.

Jharkhand was formed in November 2000 by detaching 79 lakh hectares of geographical space from the state of Bihar. Agriculture is crucial for the Jharkhand economy since it has enormous potential for development in agriculture and associated areas. the majority of the population (59%) depends on agriculture for a living, yet it only contributes 15% to the Gross State domestic product. despite having a total cultivated area of 1735 thousand hectares, agricultural output is poor and static, and cultivation costs have been rising in recent years. (Kumar, D. 2021 and Kumar, D. 2021)

Objective

The major objective to know the Causes of major Agriculture challenge in Jharkhand.

Research Questions

What are the Causes of major Agriculture challenge in Jharkhand?

Methodology

The study consists of following methodology-

1. Source of primary data: Observational, interview
2. Source of Secondary data: district census handbook Ranchi, land resources department, ministry of rural development, economic survey of Jharkhand, book, journals, newspaper etc.
3. This research paper work have been completed through descriptive and analytical method.

Result and Discussion

Jharkhand, despite being an agrarian state with a significant portion of its population dependent on agriculture, faces a myriad of challenges that severely impact its productivity and the livelihoods of its farmers. These challenges are deeply rooted in its geography, climate, historical development, and socio-economic factors.

Major agricultural challenges in Jharkhand:

1. The Unplugged Furrows: Unpacking Agricultural Challenges in Jharkhand

Jharkhand, carved out of Bihar in 2000, inherited an agricultural landscape marked by its unique topography and a strong dependence on rain-fed farming. While rich in mineral resources, its agricultural sector, which employs over 40% of the state's workforce and contributes around 13% to its Gross State Value Added (GSVA), consistently lags behind national averages in productivity.

The reasons are complex and interconnected, ranging from climatic vulnerabilities to structural deficiencies and socio-economic impediments.

2. The Vagaries of Monsoon: A Rain-Dependent Reality

One of the most fundamental challenges is the over-reliance on monsoon rainfall. Approximately 90-92% of the cultivated land in Jharkhand is rain-fed. While the state receives an average annual rainfall of 1200-1600 mm, about 80-85% of this precipitation occurs during the four monsoon months (June-September). This concentrated rainfall, often characterized by high intensity and erratic distribution, leads to:

- **Drought and Flood Cycles:** Farmers frequently face the dual threat of prolonged dry spells within the monsoon season, leading to crop failure, or excessive, high-intensity rainfall causing flash floods and soil erosion. The recent contingency plans suggested by CRIDA for delayed sowing due to excessive rain highlight this ongoing struggle.
- **Limited Cropping Intensity:** The lack of assured irrigation beyond the monsoon season restricts farmers to a largely mono-cropping pattern, primarily paddy during Kharif. This means that a significant portion of the agricultural land remains fallow during the Rabi (winter) and summer seasons, significantly limiting overall production and farmer income. Jharkhand's cropping intensity of around 117% is notably low.

3. The Irrigation Deficit: A Thirsty Land

Compounding the monsoon dependency is the woefully inadequate irrigation infrastructure. Only a meager 12-13% of the cultivable area is irrigated, a stark contrast to states like Punjab where irrigation covers up to 95% of sown area. Jharkhand's undulating hilly terrain and rocky soil structure pose significant challenges to developing traditional canal-based irrigation systems. While efforts are being made to increase irrigation coverage, the slow pace of development leaves a vast majority of farmers vulnerable. The over-reliance on groundwater in some areas is also leading to critical drops in water tables.

4. The Soil Story: Acidity, Erosion, and Low Fertility

The very earth of Jharkhand presents its own set of problems. A significant portion of the state's agricultural land (around 40%) suffers from high soil acidity. This naturally occurring condition locks up essential nutrients, making them unavailable to plants and significantly reducing crop yields. Coupled with this, the undulating terrain and high-intensity rainfall lead to severe soil erosion, washing away the fertile topsoil. The soils also generally exhibit low water retentive capacity and poor fertility (low in phosphorus, sulfur, and often boron, with medium nitrogen and potassium). These factors collectively impose a heavy stress on crop productivity and hinder crop diversification.

5. **Fragmented Holdings and Low Mechanization: Small-Scale Hurdles**

Like much of India, Jharkhand's agricultural sector is dominated by small and marginal farmers with highly fragmented landholdings. This fragmentation makes it difficult to adopt modern agricultural machinery and technologies efficiently, leading to:

- **Low Mechanization:** Labor-intensive traditional methods remain prevalent, resulting in lower productivity and higher labor costs.
- **Inefficient Resource Management:** Fragmented plots make it challenging to implement uniform irrigation, fertilization, and pest control measures.

6. **Market and Infrastructure Deficiencies: A Broken Chain**

Even if farmers manage to produce a good harvest, a host of post-harvest challenges erode their potential income:

- **Lack of Organized Marketing Facilities:** Inefficient agricultural marketing systems lead to price volatility and inadequate returns for farmers. They often rely on local intermediaries, losing out on better prices.
- **Inadequate Storage Facilities:** The absence of proper storage infrastructure at the village level forces farmers to sell their produce immediately after harvest, when prices are typically low, to avoid spoilage. This leads to significant post-harvest losses, estimated at 7% for food grains and 30% for fruits and vegetables.
- **Poor Rural Connectivity:** Inadequate rural roads and transportation networks further hinder farmers' access to larger markets and better prices.
- **Limited Access to Credit and Insurance:** Many small and marginal farmers lack access to timely, adequate, and low-cost credit from financial institutions, pushing them towards informal moneylenders and into a cycle of debt. Crop insurance penetration remains a challenge, leaving farmers exposed to significant financial risks from crop failures.

7. **Socio-Economic Factors: The Human Dimension**

Beyond the technical and infrastructural issues, socio-economic factors also play a crucial role:

- **Poverty and Illiteracy:** A significant portion of Jharkhand's rural population lives in poverty, and low literacy rates can hinder the adoption of modern agricultural practices and technologies.
- **Low Input Use:** Economic constraints often prevent farmers from investing in quality seeds, balanced fertilizers, and pest control measures, further contributing to lower yields.
- **Lack of Awareness and Capacity Building:** Despite the presence of Krishi Vigyan Kendra's (KVKs), awareness about scientific farming techniques, suitable crop varieties for specific conditions, and contingency planning remains a challenge for many farmers. Skill development in agriculture and allied sectors also lags behind demand.

8. **Climate Change: An Amplifying Threat**

Recent decades have witnessed a noticeable shift in climate patterns in Jharkhand, with increased occurrences of extreme weather events. Rising temperatures and highly variable rainfall patterns, particularly in the non-monsoon seasons, further exacerbate the existing agricultural problems. This uncertainty in monsoon onset and withdrawal dates adds another layer of complexity to farming decisions.

9. **Moving Forward: Paving the Path to Prosperity**

Addressing these multifaceted challenges requires a comprehensive and multi-pronged approach. Key areas for intervention include:

- **Aggressive Irrigation Development:** Investing in diverse irrigation methods, including small and medium-scale irrigation projects, check dams, and promoting rainwater harvesting and groundwater recharging.

- **Soil Health Management:** Implementing widespread soil testing, promoting lime application to ameliorate acidic soils, and encouraging organic farming practices to improve soil fertility and health.
- **Crop Diversification and Climate-Resilient Agriculture:** Promoting the cultivation of high-value horticultural crops, drought-resistant varieties, and millets, which are less water-intensive. Encouraging crop rotation and intercropping.
- **Strengthening Agricultural Infrastructure:** Investing in cold storage facilities, rural markets, processing units, and robust transportation networks to reduce post-harvest losses and ensure better market access for farmers.
- **Capacity Building and Extension Services:** Expanding the reach and effectiveness of agricultural extension services and Krishi Vigyan Kendra's to provide farmers with timely information, training on modern techniques, and access to quality inputs.
- **Financial Inclusion:** Improving access to institutional credit, crop insurance, and other financial services for small and marginal farmers.
- **Promoting Allied Activities:** Encouraging livestock rearing, fishery, and forestry as supplementary income sources to diversify farmers' livelihoods and reduce their sole dependence on crop cultivation.

While the challenges are formidable, Jharkhand possesses significant agricultural potential. By strategically addressing these “unplugged furrows” and empowering its farming community with the right resources and knowledge, the state can unlock the true potential of its agricultural sector, ensure food security and foster rural prosperity.

However, the future of agriculture in Jharkhand is not without hope. The increasing focus on:

- **Expanding Irrigation:** Through both large-scale projects and micro-irrigation solutions like farm ponds, check dams, and watershed development. This is crucial to de-risk agriculture from monsoon dependency and enable multi-cropping.
- **Improving Soil Health:** Through widespread soil testing, targeted nutrient management, lime application to neutralize acidity, and promotion of organic farming practices to enhance long-term soil fertility and resilience.
- **Crop Diversification:** Shifting away from just cereals to high-value horticulture (fruits and vegetables), millets, and allied activities like livestock, poultry, and fisheries. This not only increases farmer income but also provides more resilient farming systems.
- **Strengthening Market Linkages and Post-Harvest Infrastructure:** Establishing cold storage facilities, better rural roads, and promoting Farmer Producer Organizations (FPOs) to ensure farmers get fair prices for their produce and reduce post-harvest losses.
- **Technological Adoption and Capacity Building:** Encouraging the use of modern agricultural technologies, including precision farming, AI and IoT for water management, and providing continuous training and extension services to farmers through Krishi Vigyan Kendra's (KVKs).
- **Policy Support and Financial Inclusion:** Implementing farmer-centric policies that provide timely credit, effective crop insurance (like PMFBY), and direct financial assistance, while also encouraging private investment in the agricultural sector.

By systematically addressing these core issues, leveraging technological advancements, and fostering greater collaboration among farmers, Government agencies, and research institutions, Jharkhand can transform its agricultural landscape. This transformation is not merely about increasing yields; it's about building a more resilient, sustainable, and profitable agricultural sector that ensures food security, enhances rural livelihoods, and contributes significantly to the state's overall economic development. The path is challenging, but the potential rewards for millions of farmers and the state as a whole are immense.

Changing Agricultural Practices

Earlier	Now
1. Bajra, Jwar, Kedo, Modua, sava, Gondli, Tena, Geth etc were cultivated at mass level	The trend of agricultural shifted towards mushroom farming, horticulture and truck farming.
2. Rainfall agriculture was mainly practiced.	Irrigation facilities are now available.
3. People mainly performed primitive agriculture.	Gradually the trend shifted towards commercial farming.
4. At was a labour-intensive farming practice.	With improvement technology, the use of machines increases.
5. Livestock was reared at mass level because cattle played major role in agriculture.	Livestock farming decreases due to increased mechanization.
6. Poor quality seeds were used.	Use to HYV seeds.
7. Use of cow dung & organic compost manure.	Increased use of chemical fertilisers.
8. Season Based crops were Grown.	Crops are cultivated all long the year. Crop rotation, crop diversification, multiple cropping system etc also practiced.

Conclusion

Jharkhand’s agriculture is at a critical juncture. The historical reliance on rain-fed mono-cropping, coupled with inadequate infrastructure, poor soil health, and fragmented landholdings, has suppressed productivity and kept a large farming population in a cycle of low income and vulnerability. The escalating threat of climate change, manifested in erratic monsoons and extreme weather events, further amplifies these challenges, demanding urgent and adaptive strategies.

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