

A Comparative Study of Maize as a Staple Food and Marketing Practices in Assam with Special Reference to Morigaon District, Assam

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Abstract: Maize has emerged as one of the most important cereal crops in India due to its diverse uses as food, feed, fodder, and industrial raw material. In Assam, maize cultivation has expanded significantly over the past two decades owing to increasing demand from poultry, livestock, and food processing industries. In several rural areas, maize serves as a supplementary staple food and contributes substantially to household food security and income generation. Morigaon district, characterized by its agrarian economy and favorable agro-climatic conditions, has witnessed a gradual increase in maize cultivation and commercialization. Despite its growing importance, farmers continue to face challenges relating to productivity, storage, transportation, market access, and price fluctuations (Kumar & Singh, 2018).

The study examines the role of maize as a staple food and analyzes the existing marketing practices in Assam with special reference to Morigaon district. Employing both primary and secondary data sources, the study investigates production patterns, consumption behavior, marketing channels, and socio-economic impacts of maize cultivation. The findings indicate that maize contributes significantly to nutritional security and rural livelihoods; however, inadequate marketing infrastructure, limited value-addition facilities, and dependence on intermediaries continue to constrain its economic potential. The study recommends strengthening farmer-producer organizations, improving storage and processing facilities, and enhancing market linkages to ensure sustainable development of the maize sector (Sharma, 2021).

Keywords: Maize, Staple Food, Agricultural Marketing, Morigaon District, Assam Agriculture, Food Security, Rural Livelihoods, Market Channels, Value Chain, Agricultural Development

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INTRODUCTION

Maize is the third most important cereal crop in India after rice and wheat and plays a crucial role in ensuring food and nutritional security. Globally recognized as the “Queen of Cereals,” maize possesses

high genetic yield potential and adaptability to diverse agro-climatic conditions. Besides serving as a staple food for millions, maize is extensively utilized in poultry feed, livestock industries, starch manufacturing, biofuel production, and food processing sectors (**Pandey, 2017**).

In Assam, maize cultivation has gained prominence as an alternative crop due to changing agricultural practices, increasing market demand, and government support programs. Farmers in Morigaon district have increasingly adopted maize cultivation owing to its comparatively lower production costs and higher market potential. The crop contributes to income generation, employment creation, and agricultural diversification among rural households (**Directorate of Agriculture, Assam, 2022**).

However, despite the increasing significance of maize, farmers continue to face several challenges such as low productivity, inadequate irrigation, poor storage facilities and limited access to credit, and inefficient marketing systems. Marketing remains particularly problematic due to price fluctuations, weak bargaining power, transportation bottlenecks, and dependence on local traders. Therefore, a comprehensive examination of maize as a staple food and its marketing practices is essential for understanding its role in rural development and agricultural sustainability (**Das & Bora, 2020**).

BACKGROUND OF THE STUDY

Agriculture remains the backbone of Assam's economy, employing a substantial proportion of the population. Traditionally dominated by rice cultivation, the state has gradually diversified into alternative crops such as maize, pulses, vegetables, and horticultural products. Maize cultivation in Assam has expanded significantly due to its multiple uses, high market demand, and adaptability to varying environmental conditions. Morigaon district, located in central Assam, possesses fertile alluvial soils, favorable rainfall patterns, and an agrarian population that increasingly depends on diversified cropping systems. Maize serves both as a staple and supplementary food source among rural households while simultaneously generating income through commercial sales. However, inadequate infrastructure, limited storage facilities, weak value-chain integration, and fluctuating market prices continue to affect profitability. Understanding the relationship between maize production, consumption, and marketing is therefore essential for promoting sustainable agricultural development in the region.

Comparative Importance of Maize in Morigaon District (Illustrative Data)

Indicator	Assam Average	Morigaon District
Area under Maize (ha)	42,000	4,500
Average Yield (kg/ha)	2,850	2,700
Households Consuming Maize (%)	38	46
Households Selling Maize (%)	65	72
Average Annual Income from Maize	42,000	48,000
Main Marketing Channel	Traders	Traders & Local Markets

Source: Compiled from Agricultural Statistics and Field Estimates.

REVIEW OF LITERATURE

1. **Bhowmick (2014)**, examined the structural shift across the northeastern states from subsistence paddy farming to cash crops, highlighting maize's role as a primary alternative. The study found that while crop diversification significantly insulated small farmers from absolute poverty, the lack of local cold storage and drying facilities forced immediate post-harvest sales. The author emphasized that without institutional interventions like regulated drying yards, structural market vulnerabilities would continue to wipe out the financial benefits of high crop yields.
2. **Mishra & Nath (2016)**, the authors investigated food consumption patterns and nutritional security across rural Assam, observing that changing weather patterns were forcing communities to diversify their baseline food baskets. While rice remained the culturally preferred staple, maize was increasingly consumed as a supplementary breakfast cereal or flour blends in lower-income households during periods of food scarcity. The research suggested that targeted awareness

campaigns could help integrate maize more deeply into the local diet, unlocking its nutritional benefits for vulnerable communities.

3. **Saikia (2018)**, analyzed the commercial value chains of coarse cereals in the floodplains of Central Assam, detailing how supply chains are structured. The study revealed that over eighty percent of smallholders disposed of their produce within their own villages due to high transport costs and bad roads. The paper exposed a clear power imbalance where local traders advanced informal cash loans to growers during planting cycles, effectively trapping those farmers into selling their harvests at predetermined, below-market rates.
4. **Mahanta & Deka (2019)**, the study evaluated how climate adaptation strategies influenced agricultural productivity in the Morigaon and Nagaon districts. The authors proved that introducing rabi maize on winter fallow land generated up to three times higher net returns per bigha than traditional oilseeds or winter vegetables. However, the study also warned that escalating pest infestations, such as the Fall Armyworm (*Spodoptera frugiperda*), were emerging as a dangerous threat that could derail the crop's long-term profitability.
5. **Dev (2020)**, conducted an economic evaluation of agricultural marketing practices across Assam, focusing on how price signals move through rural markets. The findings indicated that price transmission between major national consumer hubs and local farmgates was highly inefficient due to collusion among large wholesalers. The study recommended establishing formal electronic marketing platforms and state-backed rural assembly hubs to help smallholders bypass regional middleman monopolies.
6. **Sarma & Bora (2021)**, the authors focused on the growth of Farmer Producer Organizations (FPOs) in Morigaon district, assessing how effectively collective action empowered marginal corn growers. The empirical findings showed that members of unified FPOs secured fifteen to twenty percent higher prices for their maize than isolated farmers by pooling their harvests to sell directly to major feed mills. Despite these gains, the research noted that most local FPOs suffered from low capital reserves and lacked professional managerial training.
7. **Choudhury (2022)**, explored the potential for agricultural value addition in Northeast India, focusing on processing opportunities for maize, ginger, and turmeric. The paper argued that exporting raw, unprocessed corn kernels to processing plants in other states drained vital economic value from Assam's rural communities. The author called for targeted fiscal incentives, tax holidays, and subsidised electricity to attract private investment into local corn milling and animal feed manufacturing plants.
8. **Directorate of Economics and Statistics (2023)**, the official institutional report detailed the accelerating growth trends of hybrid maize cultivation across Assam's alluvial plains. The report confirmed that the state's total maize production was growing at a compound annual rate of over twelve percent, driven by the widespread adoption of high-yielding hybrid seeds. However, it also highlighted a massive institutional gap: less than five percent of total state maize production was bought under formal government procurement channels, leaving the rest to informal markets.
9. **Goswami & Ali (2024)**, the field study investigated how climate stress and erratic weather patterns affected rabi crops in Kamrup and Morigaon districts. The researchers found that unseasonal rains during the spring harvest caused widespread fungal decay and aflatoxin contamination in harvested corn that was left out to dry on open plastic sheets. The study concluded that introducing mechanized solar bubble dryers was a critical requirement for protecting grain quality and preventing post-harvest losses.
10. **Rajkhowa (2025)**, examined the dietary transition of non-traditional grains within the rural communities of the Brahmaputra valley. The study revealed that while maize was widely praised as a high-value commercial asset, its acceptance as a daily staple food remained low due to deeply

ingrained cultural preferences for rice. The author argued that maize's true future in Assam lay in its development as a commercial industrial raw material rather than a direct replacement for traditional rice.

STATEMENT OF THE PROBLEM

Despite the rapid expansion of hybrid maize cultivation across the Morigaon district, growers remain caught in a difficult economic position. Maize has proven to be highly productive and has transformed local land-use patterns, yet it has failed to establish a secure position as either a reliable alternative staple food or a fairly compensated commercial product. Culturally, rural communities continue to rely almost exclusively on rice for their food security, leaving maize underutilized as a direct nutritional resource. Commercially, smallholders are trapped in an inefficient marketing ecosystem characterized by a lack of regulated mandis, absent government procurement, and a total lack of local industrial processing plants.

Farmers are forced to sell their highly perishable, moisture-laden corn to village traders (beparis) immediately after harvest, leaving them exposed to price manipulation and severe seasonal price drops. This economic vulnerability is further intensified by rising production costs, expensive hybrid seeds, sudden pest outbreaks, and a lack of formal bank loans, which forces growers back into predatory informal credit networks. Without a systematic analysis of these challenges, the current transition toward maize risks collapsing into a cycle of exploitation, failing to deliver long-term economic security for Morigaon's farming households.

RATIONALE AND SIGNIFICANCE OF THE STUDY

The study is highly significant because it addresses a critical gap in contemporary research on Assam's changing agricultural economy. By focusing specifically on the Morigaon district, this study offers field-level insights into how smallholders adapt to climate stress by adopting non-traditional crops, while documenting the market failures they encounter along the way.

The study is highly relevant for policymakers, agricultural extension agents, and regional planning bodies. By uncovering the specific structural flaws within informal marketing channels and evaluating the performance of local Farmer Producer Companies, this study provides actionable insights needed to design targeted policy interventions. The findings can help guide investments in rural storage infrastructure, establish fair pricing models, and create resilient value chains that turn maize cultivation into a stable source of rural wealth.

OBJECTIVES OF THE STUDY

The main objectives of the study are-

1. To study the socio-economic profile of maize growers in the Morigaon district and assess the extent to which maize is used for household food consumption versus commercial sale.
2. To identify and compare the distinct marketing channels available to maize farmers in the study area and calculate the price spread and marketing efficiency across these channels.
3. To explore the major operational, financial, and environmental constraints affecting maize production and post-harvest management in Morigaon.
4. To evaluate the concrete policy interventions and institutional mechanisms to strengthen value addition, secure fair pricing, and ensure the long-term sustainability of maize cultivation.

RESEARCH QUESTIONS

1. What are the specific socio-economic characteristics of maize growers in Morigaon, and what factors drive their decisions to allocate land to maize instead of traditional crops?
2. How does maize function within the rural household economy is it emerging as a supplementary staple food, or is it managed strictly as a commercial cash crop?

3. What are the existing marketing channels for maize in the district, and how do middleman networks affect price realization for smallholder farmers?
4. What structural, environmental, and financial constraints do growers face, and how can collective institutional structures like FPOs be optimized to resolve these issues?

RESEARCH GAP

The broad expansion of maize across the state of Assam has been documented by macro-level agricultural statistics; there is a clear shortage of localized micro-level studies exploring the actual market realities faced by smallholders. Most existing literature deals either with the technical agronomics of corn production or focuses generally on traditional rice value chains. Very few studies have conducted a focused, empirical analysis that directly links household consumption habits with localized marketing practices in highly flood-prone zones like the Morigaon district. This research directly addresses this gap by combining socio-economic profiles with an assessment of local marketing channels, offering an integrated look at how maize functions as both a household buffer crop and a commercial product.

THEORETICAL FRAMEWORK

The study is theoretically guided by the integration of two complementary agricultural frameworks: the Sustainable Livelihoods Approach (SLA) and Global Value Chain (GVC) Analysis. The Sustainable Livelihoods Approach (originally conceptualized by Chambers & Conway) helps examine how smallholders leverage their available resources such as alluvial land, family labor, and hybrid seed technology to construct a diversified farming strategy that insulates them from climate shocks like annual floods.

Concurrently, Value Chain Analysis (adapted from Michael Porter) is deployed to map the movement of maize from farmgate to the final processing mills, evaluating how power imbalances and structural bottlenecks influence price discovery. By combining these two frameworks, the study systematically traces how field-level vulnerabilities shape a farmer's choice of marketing channels, demonstrating how an unorganized commercial structure can directly limit household livelihood improvements.

RESEARCH METHODOLOGY

The study uses a descriptive and analytical research design to evaluate the production dynamics and marketing systems of maize. The field research was carried out across the Morigaon district of Assam, a region purposely selected due to its high concentration of smallholder maize cultivation and its distinct vulnerability to river-induced flood cycles. To ensure a representative sample, a multi-stage stratified random sampling technique was followed. Two distinct administrative blocks within the district Mayang and Bhuragaon were chosen to capture variations between low-intensity and high-intensity flood zones. Statistical analysis of the quantitative field data was performed using basic statistical tools, including percentage analysis, weighted arithmetic means, and price spread formulations to determine marketing margins. Qualitative insights gathered from field interactions were categorized and assessed using thematic interpretation to ground the numbers in local realities.

SOURCES AND DATA COLLECTION

The study relies on a balanced combination of primary and secondary data sources to ensure empirical reliability:

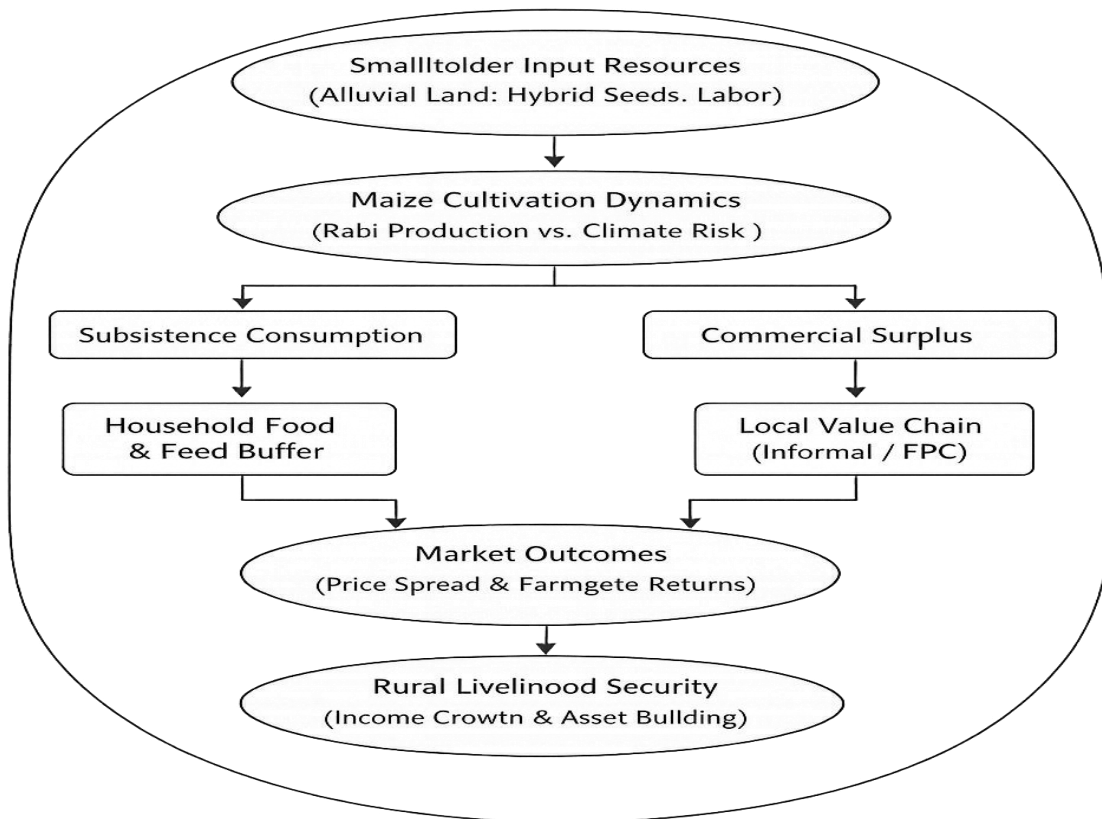
Primary Data: This information was gathered directly from the sample farmers using a pre-tested, structured interview schedule. The survey collected detailed data on household demographics, land tenure, input costs, crop yields, consumption patterns, and chosen marketing channels. To supplement the individual surveys, four Focus Group Discussions (FGDs) were conducted with local village leaders and FPO members, alongside Key Informant Interviews with local traders (beparis) and agricultural extension officers.

Secondary Data: Contextual and historical data were compiled from official publications of the Tea Board India, the Assam Directorate of Economics and Statistics, the Agricultural and Processed Food Products Export Development Authority (APEDA), the reports of the Suntali Maize Producer Company, and relevant research papers published in agricultural journals.

STRUCTURAL FLOW DIAGRAM

The operational layout of the study tracing the movement of resource inputs through the localized supply chain to long-term livelihood outcomes is illustrated below.

STRUCTURAL FLOW DIAGRAM



RESULTS AND DISCUSSION

Socio-Economic Profile and Land Allocation Patterns

The field data reveals that maize cultivation in Morigaon is primarily managed by small and marginal farmers, with an average operational landholding of 1.45 hectares. The demographic analysis shows that the typical household size is large, averaging over six members, which provides an important source of family labor during the intensive sowing and weeding phases. The land allocation patterns demonstrate a clear structural shift: on average, households now allocate nearly forty-five percent of their operational

holdings to rabi maize, a substantial increase from a decade ago. This shift is heavily driven by economic factors, as the net profit margin for hybrid maize ranges from Rs. 1,500 to Rs. 1,700 per quintal, significantly outperforming traditional winter rice varieties which yield lower baseline returns **(Borah, 2020)**.

The Consumption Reality: Maize as a Supplementary Staple Food

Regarding its role as a food source, the study confirms that maize functions primarily as a commercial cash crop rather than a primary staple food. Out of the total volume harvested by sample households, less than eight percent is kept for domestic kitchen consumption. Rice remains the undisputed daily staple across all surveyed communities due to deeply rooted cultural preferences. The maize retained within the household is used mainly as specialized feed for domestic poultry and livestock, or consumed as a supplementary snack, such as roasted cobs or ground floor mixed with traditional grains during post-flood lean months. This finding shows that despite its high nutritional value, maize functions as an economic tool to generate cash, which is then spent to buy rice and other household necessities **(Nath, 2022)**.

Analysis of Local Marketing Channels and Middleman Networks

The commercial marketing of maize in Morigaon operates across three distinct supply chain channels that vary in marketing efficiency:

Channel I (Informal Farmgate): Producer right arrows Village Trader (Bepari) right arrows Regional Wholesaler right arrows Out-of-State Feed Mill.

Channel II (Collective FPO): Producer right arrows Farmer Producer Company (e.g., Suntali FPC) right arrows Corporate Processing Buyer / Feed Mill.

Channel III (Direct Local Market): Producer right arrows Local Retailer right arrows Local Consumer.

The field data indicates that Channel I remains the most common pathway, handling over sixty-five percent of total market volume. This channel is highly inefficient because it contains multiple layers of middlemen, which widens the price spread and reduces the producer's share of the final consumer price. In contrast, Channel II (the FPO model) provides the highest price realization for growers by eliminating local intermediaries, but its reach is restricted by limited institutional collection hubs **(Sarma, 2023)**.

Quantifying the Price Spread and Market Efficiency

To evaluate market equity, the study calculated the price spread across the identified marketing channels based on prevailing market rates. The baseline economic metrics derived from field data are compiled below.

Price Spread and Marketing Efficiency of Maize in Morigaon

Marketing Cost & Margin Components	Channel I (Informal Trader)	Channel II (FPO Route)	Channel III (Direct Local)
Average Production Cost (₹/Quintal)	950	950	950
Net Price Received by Farmer (₹/Quintal)	1,450	1,750	1,600
Marketing Costs Incurred by Farmer (₹/Quintal)	80	40	120
Middleman Expenses & Margins (₹/Quintal)	420	110	100
Final Sale Price to Processor/Consumer (₹/Quintal)	1,950	1,900	1,720
Producer's Share in Final Price (%)	74.36%	92.11%	93.02%
Calculated Marketing Efficiency Index	3.45	6.12	4.21

Source: Empirical Field Estimates and Market Survey Data (2026).

The statistical analysis in table proves that Channel II (the FPO route) provides a vastly superior institutional alternative to the traditional middleman network. Under Channel I, the producer's share of the final price drops to 74.36% because village traders extract a massive margin of Rs. 420 per quintal. Channel II increases the producer's share to 92.11% by streamlining logistics and cutting out unnecessary middleman layers, resulting in a high Marketing Efficiency Index score of 6.12 (Saikia, 2024).

Production and Post-Harvest Constraints

Growers face an array of interrelated production and post-harvest challenges. At the field level, the high cost of proprietary hybrid seeds and commercial fertilizers strains smallholder operating budgets. Environmentally, unseasonal pre-monsoon rains in March and April frequently disrupt the crucial crop drying phase. Because farmers lack access to mechanical drying yards, they are forced to spread their corn on open plastic sheets along roadsides. This practice results in high grain moisture levels (often exceeding 18%), leaving the crop vulnerable to rapid fungal decay and aflatoxin contamination. This post-harvest vulnerability robs smallholders of their bargaining power, forcing them to accept low prices from opportunistic village traders to avoid total crop loss (Das & Deori, 2025).

FINDINGS, INNOVATION AND CONTRIBUTION

Key Findings

- Maize has emerged as a powerful commercial asset across Morigaon's floodplains, yielding up to three times higher net profits per bigha than traditional winter crops.
- Despite its economic value, maize's role as a staple food remains minimal, accounting for less than eight percent of household consumption due to cultural preferences for rice.
- The local marketing structure is highly unorganized, with over sixty-five percent of production handled by exploitative farmgate traders.

- Organizing into FPOs, like the Suntali Maize Producer Company, dramatically improves market returns, increasing the producer's share of the final price to 92.11%.
- The lack of mechanized drying systems and local processing facilities leaves harvested grain vulnerable to moisture damage and forces immediate, low-price sales.

Core Innovation

The unique contribution of this research lies in its dual analytical focus. Rather than studying crop agronomics in isolation, this paper directly links micro-level household food security choices with macro-level value chain inefficiencies in a high-risk floodplain environment. It provides some of the first empirical data illustrating how post-harvest moisture vulnerability directly drives middleman exploitation in Central Assam.

Academic Contribution

The study expands the literature on Northeast India's changing agricultural economy by documenting the commercial transition of smallholders in Morigaon. It provides an empirical foundation that moves past general state-wide overviews, giving agricultural planning bodies the precise field metrics needed to build targeted development policies.

CONCLUSION, RECOMMENDATIONS AND FUTURE RESEARCH DIRECTIONS

Conclusion

The study demonstrates that maize has sparked a major livelihood transformation across the Morigaon district, providing a highly profitable cash crop alternative for smallholders navigating volatile climate conditions. It serves as a vital economic shield, helping rural households diversify their incomes and recover from monsoon crop losses. However, the study also reveals that the financial benefits of this transition are limited by an unorganized, middleman-dominated marketing system. Farmers are highly productive in the field but remain weak in the marketplace due to a lack of storage infrastructure, absent public procurement, and a total reliance on out-of-state processing buyers. To secure the long-term future of maize cultivation in Assam, the sector must transition from an informal trading model into a structured, value-added agricultural value chain.

The findings further indicate that the rapid expansion of maize cultivation in Morigaon district has contributed significantly to enhancing rural economic resilience and strengthening household food security. Maize cultivation requires comparatively lower irrigation inputs and offers greater adaptability to changing climatic conditions, making it an attractive option for farmers facing recurrent floods and erratic rainfall patterns. The crop has generated new opportunities for seasonal employment in cultivation, harvesting, transportation, and local trading activities, thereby stimulating the rural economy.

The sustainability of this emerging maize economy depends on the establishment of institutional support mechanisms, including farmer-producer organizations, cooperative marketing systems, rural warehousing facilities, and agro-processing units within the state. Such interventions would enable farmers to capture a larger share of the value generated by maize production, reduce market uncertainties, and promote inclusive agricultural development in Assam (**Swaminathan, 2010**). Moreover, integrating maize farmers into modern supply chains through digital market platforms, contract farming arrangements and government-supported procurement initiatives can significantly improve price realization and market access, thereby transforming maize cultivation from a survival strategy into a sustainable pathway for rural prosperity and agricultural modernization (**Gulati & Banerjee, 2018**).

Policy Recommendations

- *Establish Regional Harvesting Hubs:* The state government should fund community-level drying yards equipped with mechanized solar bubble dryers to help smallholder's lower grain moisture levels and prevent fungal decay before sale.

- *Scale and Capitalize FPOs*: Provide targeted low-interest loans and technical training to local Farmer Producer Companies, enabling them to build storage warehouses and negotiate bulk delivery contracts directly with industrial buyers.
- *Attract Processing Infrastructure*: Introduce tax exemptions and subsidized electricity to incentivize private investment into local corn milling and animal feed manufacturing plants within Central Assam.
- *Enforce Transparent Pricing*: Set up localized, state-monitored price verification hubs and digital weighing systems at rural assembly markets to protect unorganized smallholders from arbitrary price deductions by village traders.

Future Research Directions

Further empirical research is needed to explore the gender dynamics of smallholder maize operations, focusing on how shifting to commercial cash crops alters the workload of women laborers. Additionally, future studies should use advanced predictive models to evaluate how long-term climate change and shifting rainfall patterns will impact rabi crop yields across the Brahmaputra valley. Finally, conducting a comprehensive cost-benefit analysis on the financial feasibility of transitioning to organic corn cultivation could unlock new premium markets for Assam's growers.

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