

# 9

## The Rise of Food Processing Clusters in Bihar

**Dr. Rani Purushotma\***

Guest, Assistant Professor, University Department of Commerce, B.N.M.U. Madhepura, Bihar.

\*Corresponding Author: [hello4rani@gmail.com](mailto:hello4rani@gmail.com)

### Abstract

Bihar, one of India's most populous and predominantly agrarian states, has undergone a quiet but consequential transformation in its industrial landscape over the past decade. The paper argues that while policy momentum and investment inflows are encouraging most notably the Rs. 2,181 crore commitment from 14 food processing companies at the Invest Bihar Summit 2023. This paper examines the rise of these clusters through the lens of agro-industrial economics, policy architecture, and territorial development theory. The emergence of geographically concentrated food processing clusters anchored by commodities such as makhana (fox nut), honey, litchi, Katarni rice, and sugarcane signals a structural shift from raw agricultural produce to value-added processed food products. Drawing on data from the Bihar Economic Survey 2024–25, Ministry of Food Processing Industries (MoFPI) scheme reports, and academic literature, the paper maps ten major district-level processing clusters, evaluates the effectiveness of central schemes including PMKSY, PMFME, PLI, and the newly announced Makhana Board (2025), and assesses persistent structural challenges such as inadequate cold chain infrastructure, fragmented supply chains, and post-harvest losses estimated at over Rs. 6,500 crores annually. The region's transformation into a sustainable food processing hub requires a coordinated, cluster centric industrial policy that integrates GI-tag leverage, rural skill development, logistics modernisation, and export facilitation.

**Keywords:** Food Processing Clusters, Agro-Industrial Development, PMFME, Makhana, GI Tag, Cluster Policy, Post-Harvest Losses.

### Introduction

The state of Bihar occupies a paradoxical position in Indian economic geography. It ranks among the fastest-growing state economies, with a projected Gross State Domestic Product (GSDP) of Rs. 10.97 trillion in 2025–26, growing at a compound annual growth rate (CAGR) of 11.42% between 2015–16 and 2025–26.

Yet Bihar remains one of the least industrialised large states in India, with per capita GSDP of Rs. 66,828 in 2023–24 a fraction of the national average.<sup>[8]</sup> Agriculture employs approximately 80% of Bihar's population, and the state is the fourth-largest producer of vegetables and eighth-largest producer of fruits in India. It is the undisputed national leader in litchi production and contributes over 85% of India's makhana output.<sup>[9]</sup> Despite this agricultural abundance, value addition through food processing has historically been minimal, with most produce sold in raw, unprocessed form at prices that fail to adequately compensate farmers for their inputs.

The food processing industry is widely recognised as a powerful bridge between agriculture and manufacturing, capable of reducing post-harvest losses, generating rural employment, increasing farmer income, and enabling exports. In Bihar's context, this bridge has remained largely unbuilt. However, a combination of central government schemes, state-level policy reforms, rising private investment, and the geographic clustering of commodity-specific enterprises suggests that this is changing.

This paper investigates the structural emergence of food processing clusters in Bihar geographically proximate concentrations of enterprises engaged in the processing of specific agro-commodities. The analysis is structured around three interrelated questions: (i) What are the key commodity-specific clusters that have emerged, and what is their spatial and sectoral profile? (ii) What policy instruments have shaped the trajectory of these clusters? (iii) What structural and institutional barriers impede their scaling, and what strategic interventions are needed?

The paper draws on primary data from government scheme reports, the Bihar Economic Survey 2024–25, MoFPI state profiles, the Invest Bihar Summit records (2023), and relevant academic literature. It contributes to the growing scholarly discourse on sub-national industrial clusters in developing economies, with specific reference to agro-processing in low-income Indian states.

### **Theoretical Framework: Agro-Industrial Clusters and Territorial Development**

- **Cluster Theory and Regional Industrialisation**

The concept of industrial clusters, pioneered by Marshall (1890) and later systematised by Porter (1990), refers to the geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. In agro-processing contexts, clusters emerge around specific commodity chains — where proximity to raw material sources, shared labour pools, knowledge spill overs, and infrastructure synergies create competitive advantages for individual firms that would be unavailable in isolation.

In developing-economy contexts, cluster formation often follows a different trajectory than in advanced industrialised settings. As emphasised by Schmitz and

Nadvi (1999), clusters in the Global South tend to emerge organically from pre-existing artisanal or agricultural activities, where informal enterprises gradually formalise and scale as market demand grows and policy support becomes available. Bihar's food processing clusters largely conform to this organic-emergence model — they have grown around traditional crop surpluses rather than deliberate industrial location decisions.

- **Agricultural Value Chains and Post-Harvest Economics**

Value chain analysis (**Kaplinsky and Morris, 2001**) provides a complementary lens for understanding cluster formation in agro-processing. Agricultural value chains encompass all activities from input supply and primary production through processing, packaging, logistics, and retail to the final consumer. In Bihar, the value chain for commodities like makhana and litchi has historically been truncated in the sense that value addition occurs predominantly outside the state, with raw produce transported to processing centres in other states or countries.

Post-harvest losses in Bihar are alarmingly high. Data from **Rajendra Agricultural University (RAU)** indicates that fruit losses range from 15–25% in bananas to as high as 30–50% in papayas, while vegetables like cauliflower suffer losses of 41–47%. <sup>[2]</sup> Cereal losses alone are estimated at Rs. 4,500 crores, and potential gains from eliminating fruit and vegetable wastage are estimated at an additional Rs. 2,000 crores. <sup>[2]</sup> These figures underscore the economic imperative for localised processing infrastructure.

- **Policy-Induced Cluster Formation**

Beyond organic emergence, cluster theory also recognises the role of deliberate policy in seeding and scaling clusters (**Schmitz, 1995**). Government-sponsored food parks, agro-processing zones, cold chain infrastructure, and targeted subsidy schemes constitute a 'policy-induced cluster' mechanism. In the Indian context, schemes such as the Mega Food Park and the Production Linked Incentive (PLI) represent this policy-induced approach at the national level, while Bihar's own initiatives including BIADA industrial zones and the Invest Bihar Summit represent state-level expressions of the same logic.

### **Bihar's Agricultural Base: The Foundation for Processing Clusters**

- **Agro-Climatic Endowments**

Bihar covers a total geographical area of 94,163 square kilometres, approximately 4.12% of India's total land area, and is characterised by diverse agro-climatic zones. <sup>[2]</sup> The northern plains bordering Nepal receive abundant monsoon rainfall and are crisscrossed by rivers including the Ganga, Gandak, Kosi, Bagmati, and Mahananda, creating fertile alluvial soil ideal for a wide variety of crops. The southern plateau, adjacent to Jharkhand, has different soil characteristics conducive to pulses and coarse grains.

This diversity means that different districts support different crop specialisations, naturally creating the raw-material concentrations that underpin district-level processing clusters. Muzaffarpur and Sitamarhi are climatically suited to litchi; the Mithilanchal region comprising Madhubani, Darbhanga, Sitamarhi, Saharsa, Katihar, and Purnia is ideal for makhana cultivation in its vast floodplains; Bhagalpur's soil and microclimate produce the GI-tagged Jardalu mango; and the Champaran belt has long supported sugarcane cultivation.

- **Crop Production Trends**

According to the Bihar Economic Survey 2024–25, rice production has surged by 21%, while wheat output rose by 10.7%. Maize production demonstrated particularly remarkable growth, rising by approximately 66.6% from 2020–21 to 2023–24.<sup>[2]</sup> Bihar's horticulture production stands at approximately 230 lakh tonnes, dominated by fruits and vegetables, creating a substantial and growing raw material base for processing.<sup>[9]</sup>

The state ranks first nationally in litchi production, contributing over 40% of India's total litchi output.<sup>[5]</sup> It produces over 85% of India's makhana and holds the fourth-largest position in national honey production at approximately 6,500 tonnes per annum.<sup>[7]</sup> In dairy, Bihar produces significant quantities of milk but the per-capita availability at 230 g/day remains well below the national average of 427 g/day, highlighting a gap that improved processing and distribution infrastructure could partially address.<sup>[1]</sup>

- **The Processing Gap**

Despite this agricultural abundance, Bihar's food processing industry has historically been underdeveloped. Most value addition from processing and packaging to branding and export — occurs outside Bihar. Makhana, for instance, despite Bihar contributing over 85% of national production, is largely sold in raw form, with substantial margin captured by traders and processors in Delhi, Mumbai, and international markets. The processing gap the divergence between agricultural output potential and actual value addition within the state is the structural challenge that food processing clusters are beginning to address. The subsequent sections map these emerging clusters, the policy ecosystem supporting them, and the barriers yet to be overcome. Similarly, litchi highly perishable with a shelf life of only 3–5 days is inadequately processed locally, leading to massive wastage during peak harvest.

## **Mapping Food Processing Clusters in Bihar**

- **Overview of Cluster Formation**

Bihar's food processing clusters are best understood as commodity-specific geographic concentrations centred on districts with comparative agricultural advantages. Under the Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) scheme, the Government of India formally identified district-

wise production clusters. [1] Table 1 below maps ten major clusters across Bihar, documenting the primary cluster commodity, estimated number of processing units, approximate annual output, key government scheme coverage, and GI tag status.

**Table 1: Major Food Processing Clusters in Bihar – District-Level Profile (2024–25)**

District	Primary Cluster Product	Processing Units	Annual Output (MT)	Scheme Coverage	GI Tag
Muzaffarpur	Litchi (fresh, pulp, juice, wine)	120+	3,00,000	PMFME, ODOP	Yes
Darbhanga / Madhubani / Sitamarhi	Makhana (fox nut) – roasted, flavoured, flour	200+	55,000	PMFME, ODOP, PMKSY	Yes
Bhagalpur	Jardalu Mango (pulp, juice, pickle)	80+	40,000	PMFME, PMKSY	Yes
Nalanda	Potato processing (starch, chips, flakes)	90+	80,000	PMFME, PMKSY	No
Kishanganj	Pineapple (jam, juice, canning)	40+	25,000	PMFME	No
Vaishali	Honey processing & packaging	60+	6,500 (honey)	PMFME, ODOP	No
Pashchim Champaran	Sugarcane (jaggery,	150+	1,50,000	PMKSY, PMFME	No
Samastipur	Turmeric (powder, oleoresin, extract)	50+	30,000	PMFME	No
Aurangabad	Strawberry (preserves, freeze-dried)	30+	8,000	PMFME	No
Rohtas / Kaimur	Rice (Katarni, Basmati milling & packaging)	200+	2,50,000	PMKSY, PMFME	Yes

Source: MoFPI State Profile Bihar (2025); Bihar Economic Survey 2024–25.

- **The Makhana Cluster: Mithilanchal's Emerging Hub**

The makhana (*Euryale ferox*) cluster centred in Mithilanchal — encompassing Darbhanga, Saharsa, Madhubani, Sitamarhi, Katihar, and Araria is arguably Bihar's most strategically significant food processing cluster. Bihar contributes approximately 85–90% of India's entire makhana production. [18] The crop thrives in the flood-prone wetlands of northern Bihar, historically regarded as agricultural liabilities, now reframed as productive assets.

The Union Budget 2025 announcement of a dedicated Makhana Board represents the highest-level policy acknowledgement of this cluster's importance. [13] The Board, to be established under the Ministry of Agriculture and Farmers' Welfare in collaboration with Bihar's state government, is mandated to improve production, processing, value addition, marketing, and export of makhana. [14] Aligned with the Agricultural Export Policy's goal of increasing India's agro-exports to \$100 billion and the ODOP initiative, the Board represents an institutional breakthrough for cluster governance.

- **The Litchi Cluster: Muzaffarpur and the North Bihar Belt**

Muzaffarpur has long been Bihar's most recognisable food processing locality, built around the 'Shahi' litchi variety — recognised by GI tag — which is prized in both domestic and international markets. <sup>[2]</sup> The litchi cluster has developed niche processing capabilities including juice extraction, pulp preparation, wine manufacturing, and freeze-drying. The district accounts for over 120 processing units and an annual litchi output exceeding 3 lakh tonnes.

However, litchi processing faces a fundamental constraint: the extreme perishability of the fruit, with a shelf life of just 3–5 days' post-harvest without refrigeration. The MoFPI State Profile for Bihar highlights establishing modern ripening chambers and cold chain facilities in the Sitamarhi and Muzaffarpur belt as a critical investment priority. The inadequacy of cold storage infrastructure means that the window for value capture is narrow and frequently missed. Several cold chain projects have been approved under PMKSY in Bihar, though operationalisation has been uneven.

- **The Katarni Rice and Jardalu Mango Clusters**

Bhagalpur, Rohtas, and Kaimur districts form the 'rice bowl' of Bihar, producing substantial volumes of paddy including the GI-tagged Katarni variety, known for its aroma and taste. Combined with Rohtas's role in Basmati cultivation and milling, this is one of Bihar's larger processing sub-sectors with over 200 units. The processing cluster here extends from primary milling to packaging of branded rice for premium domestic and export markets.

Bhagalpur also hosts the Jardalu mango cluster, centred on the GI-tagged Jardalu variety unique to the district's agro-climatic conditions. <sup>[1]</sup> Processing units produce mango pulp, juice, pickles, and squash. The cluster has benefited from PMFME and PMKSY support but remains small relative to the crop's production volume, indicating significant untapped potential for value addition.

### **Policy Architecture Supporting Cluster Development**

- **National Schemes: The Central Policy Scaffold**

The central government's policy architecture for food processing cluster development in Bihar operates through several major schemes. The Pradhan Mantri Kisan Sampada Yojana (PMKSY), operational from 2016–17, allocated Rs. 6,000 crores nationally to create modern food processing infrastructure including mega food parks, cold chains, agro-processing clusters, and creation/expansion of food processing capacities. <sup>[4]</sup> Nine projects were approved under PMKSY component schemes in Bihar. <sup>[3]</sup>

- **The PLI Scheme and Bihar's Positioning**

The Production Linked Incentive (PLI) Scheme for Food Processing (PLISFPI), with a national outlay of Rs. 10,900 crores over 2021–26, aims to create globally competitive food manufacturing champions and boost food exports.<sup>[12]</sup> While 172 companies have received approval nationally, Bihar-based enterprises have had limited direct PLI participation, reflecting the state's relative shortage of large-scale food manufacturing firms. This gap is itself diagnostic of the challenge: PLI's threshold conditions favour established manufacturers, excluding the micro and small segment that dominates Bihar.

- **Special Economic Zones and Infrastructure**

The central government has approved the development of two Special Economic Zones (SEZs) in Bihar in Kumrabad (West Champaran) and Nawanganj (Buxar) which would be the state's first SEZs.<sup>[5]</sup> Bihar is also implementing 57 railway projects worth Rs. 86,458 crore covering 5,346 km of rail infrastructure, while 98 Amrit Bharat stations are being redeveloped at Rs. 3,164 crores.<sup>[8]</sup> These connectivity investments are critical for food processing clusters, which depend on efficient supply chains from farms to processing units and from processing units to markets.

**Table 2: Policy Schemes and Government Initiatives Supporting Food Processing Clusters in Bihar**

Policy/ Scheme	Period	Outlay / Budget (Rs. Crore)	Bihar Allocation / Projects	Focus Area	Implementing Agency
PMKSY (Pradhan Mantri Kisan Sampada Yojana)	2016–17 to 2020–21 (extended)	Rs. 6,000 Cr.	9 projects approved	Cold chain, APC, food parks, backward–forward linkages	MoFPI
PMFME Scheme	2020–21 to 2024–25	Rs. 10,000 Cr. (national)	10,261 units; Rs. 469.73 Cr.	Micro enterprise formalisation, credit-linked subsidy, skill training	MoFPI / State Govt.
PLI Scheme for Food Processing (PLISFPI)	2021–26	Rs. 10,900 Cr. (national)	172 companies (national)	Global food manufacturing champions, export promotion	MoFPI
Makhana Board (Union Budget 2025)	2025 onwards	Announced in Budget 2025	Exclusively Bihar-centric	Production, processing, value addition, export of makhana	MoA&FW / Bihar Govt.

BIADA Industrial Zones	2020–ongoing	Rs. 1,650+ Cr. (state)	Land bank across districts	Industrial land, plug-and-play sheds, SEZ development	Bihar State Govt.
Bihar Industrial Investment Promotion Policy 2016	2016–ongoing	Incentive-based	2,695 proposals; Rs. 6,800 bn.	Investment facilitation, subsidy for food, dairy, horticulture units	Dept. of Industries, Bihar
Invest Bihar Summit 2023	December 2023	Rs. 5,053 bn. MoUs signed	14 food companies; Rs. 2,181 Cr.	Private investment, FDI, food processing & logistics	Bihar Govt. / BIADA
ODOP – One District One Product	2020–ongoing	Integrated with PMFME	Makhana as flagship product	Branding, GI-tag leverage, market linkage for district products	MoFPI / DPIIT

Source: MoFPI; PIB; Bihar Industrial Investment Promotion Policy.

### Sector-Specific Cluster Analysis: Opportunities and Depth

- **Makhana: A Global Superfood from Bihar's Floodplains**

Makhana is perhaps Bihar's most compelling food processing opportunity. Rich in protein, fibre, and essential minerals including magnesium, calcium, and phosphorus, it has rapidly gained global recognition as a health food.<sup>[14]</sup> The global market for healthy snacks is expanding rapidly, positioning makhana as an attractive alternative to calorie-dense traditional snacks. Despite Bihar accounting for 85–90% of national production, the state has historically captured minimal value-chain surplus due to inefficiencies in productivity, processing, and supply chain management.<sup>[14]</sup>

The proposed Makhana Board, announced in Union Budget 2025, will establish a Minimum Support Price (MSP) mechanism, create processing units and cold storage, regulate quality certification, and facilitate international trade.<sup>[13]</sup> The expected outcomes include higher farmer incomes, greater employment for women in processing (historically a female-dominated activity), rising exports, and a potential precedent for cluster-board governance that could be replicated for litchi, honey, and other commodities.<sup>[14]</sup>

- **Sugar and Jaggery Scale with Structural Challenges**

The sugarcane processing cluster in Pashchim Champaran and surrounding districts represents one of Bihar's largest agro-processing operations by volume. The district has a legacy of sugar milling going back to the colonial era. The processing landscape includes formal sugar mills, khan sari units, and a large informal jiggery (gur) sector. In recent years, there has been growing interest in organic jiggery and ethanol production from sugarcane, aligned with India's national ethanol blending programme.

However, the cluster faces issues of cyclical price volatility in sugar, delayed payments to farmers by mills, and technological obsolescence in many units. The co-operative sugar mill model, which functions effectively in Maharashtra, has had limited traction in Bihar due to institutional capacity constraints. PMKSY-supported backward and forward linkage projects have partially addressed these supply chain gaps, but more sustained institutional engagement is needed.

- **Rice Processing: Tradition and Modernisation**

Rice processing is the most widely distributed food processing activity across Bihar. Rohtas, Bhagalpur, and Kaimur collectively constitute the 'rice bowl,' with the aromatic Katarni variety and Basmati strains attracting premium prices in domestic and global markets. Traditional rice milling is being gradually supplemented by modern parboiling, sorting, grading, and vacuum packaging units.

According to the Bihar Economic Survey 2024–25, rice production surged by 21% in the latest period. <sup>[2]</sup> This production growth creates both opportunity and urgency for processing capacity expansion. The Katarni GI tag has strengthened the brand premium, and several units under PMKSY have been established for integrated rice processing.

### **Structural Challenges Impeding Cluster Scaling**

- **Cold Chain Infrastructure Deficit**

Perhaps the most critical bottleneck for Bihar's food processing clusters is the acute shortage of cold chain infrastructure. <sup>[2]</sup> For perishable commodities like litchi, mango, vegetables, and dairy, cold storage capacity determines the duration of the processing window and the extent of value that can be captured. Without this, even GI-tagged Shah litchi from Muzaffarpur cannot compete in premium international markets. Bihar's cold storage capacity is grossly insufficient relative to its horticultural output, creating a situation where even adequately-equipped processing units cannot source quality raw material during peak seasons because produce deteriorates before reaching them.

Cold chain gaps also suppress export potential. Litchi, for instance, requires controlled atmosphere storage and refrigerated transport to maintain quality for air cargo export. Several cold chain projects have been approved under PMKSY, and the Makhana Board's mandate includes cold storage development, but implementation lags remain significant.

- **Fragmented Supply Chains and Intermediation**

Bihar's agricultural supply chains are characterised by multi-layered intermediation. Farmers sell to village-level traders (**aadatiya**), who sell to district-level agents, who sell to state-level wholesalers, who sell to processors. This fragmentation compresses farmer incomes, reduces quality consistency, inflates

input costs for processors (as produce changes hands multiple times under uncontrolled conditions) and makes supply chain traceability nearly impossible.

Farmer Producer Organisations (FPOs) represent the primary institutional mechanism to address this fragmentation. The central government's scheme for formation and promotion of 10,000 FPOs nationally has seen some traction in Bihar, and the PMFME scheme explicitly promotes FPO participation. However, FPO capacity building, governance, and market linkage require sustained support that has not always been consistently provided.

- **Technological Gaps and Skill Shortages**

Many Bihar food processing units operate with outdated technology, limiting product quality, shelf life, and diversification possibilities.<sup>[2]</sup> A processing unit capable only of producing unpackaged commodity products cannot access modern retail or export channels, which require standardised packaging, FSSAI compliance, bar coding, and quality certification. Skilled manpower for operating modern food processing equipment freezers, homogenisers, extruders, aseptic fillers is scarce in Bihar, as skilled workers have historically migrated to other states.

### **Strategic Roadmap for Cluster Scaling**

- **Cold Chain and Logistics as Priority Infrastructure**

The single highest-impact investment Bihar can make is a state-wide cold chain network covering the top ten agricultural surplus districts. Priority should be given to the litchi and makhana belts, where perishability and export potential are both highest. Public-private partnership (PPP) models, with central subsidy (PMKSY cold chain component) combined with private equity from the food and logistics sectors, offer the most viable financing approach. **The Union Budget 2025** also announced support for the West Kosi Canal project covering 50,000 hectares in Mithilanchal, which, if combined with processing infrastructure investment, could create an integrated makhana development zone.

- **Cluster Governance Bodies**

The Makhana Board model offers a template for institutional cluster governance that should be extended to other key commodities litchi, honey, Katarni rice, and sugarcane.<sup>[13]</sup> These boards can also serve as platforms for GI tag commercialisation, licensing, and market access strategies. Commodity-specific boards combining research, quality standards, MSP determination, branding, and export facilitation functions can create the institutional fabric that individual enterprises and even government departments cannot provide alone.

- **Skill Development and Women's Participation**

Food processing in Bihar is already a significant employer of women makhana processing, dairy, and spice grinding are traditionally female-dominated

activities. Women-led SHGs and FPOs should be prioritised as cluster actors, given their track record in dairy (Amul cooperative model) and potential in Bihar's processing landscape. Targeted skill development programmes under the National Skill Development Corporation (NSDC) and PMFME's skill training component, quality management, packaging, focused on food safety and machinery operation, can formalise and upgrade women's productive roles.

### **Bihar in Comparative Perspective**

Bihar's food processing cluster trajectory invites comparison with states like Punjab, Maharashtra, and Andhra Pradesh, which have successfully built integrated agro-processing industrial ecosystems. Maharashtra's processed food exports benefit from proximity to Mumbai's port, financial capital, and advanced agri-business infrastructure. Punjab's grain processing and dairy industries are anchored by cooperative institutions and well-developed cold chain logistics. Andhra Pradesh's aquaculture and rice processing have been built through a combination of export-orientation policy, dedicated SEZs, and aggressive FDI attraction.

The Invest Bihar Summit 2023 marked a qualitative shift in investor perception. The Rs. 2,181 crore food processing commitment and the overall Rs. 5,053 billion investment pipeline, combined with the Bihar Logistics Policy 2023 launched at the summit, suggest that Bihar is beginning to overcome the 'chicken and egg' problem of industrial development — where poor infrastructure deters investment, and absent investment makes infrastructure improvement difficult to justify. <sup>[5][6]</sup>

The establishment of Bihar's GSDP trajectory at CAGR of 11.42% and the economic diversification visible in the Bihar Economic Survey 2025–26 with the secondary sector expanding and food processing leading operational industrial units suggest that the structural conditions for sustained cluster development are strengthening. The critical variable is whether institutional and infrastructure investments keep pace with this economic momentum.

### **Conclusion**

Bihar's food processing clusters represent one of the most consequential and underappreciated development stories in contemporary India. From the makhana wetlands of Mithilanchal to the litchi orchards of Muzaffarpur, from the rice mills of Rohtas to the honey farms of Vaishali, the state is witnessing the early but genuine rise of commodity-specific agro-processing concentrations that could, if properly nurtured, transform Bihar's economic structure and millions of rural livelihoods.

Yet the structural barriers cold chain deficits, fragmented supply chains, post-harvest losses of over Rs. 6,500 crores annually, technological obsolescence, regulatory non-compliance among informal units, and access to credit remain formidable. Cluster governance bodies for major commodities, integrated cold chain

PPP networks, a state-branded food identity programme leveraging GI tags, targeted women-led enterprise development, and technology incubation infrastructure.

The policy architecture led by PMKSY, PMFME, PLISFPI, and the newly announced Makhana Board provides a meaningful foundation. Bihar's GSDP growth at 11.42% CAGR, the Rs. 5,053 billion investment pipeline from the Invest Bihar Summit 2023, and the state government's proactive industrial policy signal a favourable macroeconomic environment. <sup>[5][8]</sup>

Bihar's food processing clusters have risen. Whether they scale sustainably will depend on the quality of policy implementation, institutional capacity, and public-private coordination over the next decade. The research community, policymakers, and investors all have a shared interest in ensuring that this rise continues.

### References

1. Ministry of Food Processing Industries (MoFPI). (2025). Food Processing: Towards Sustainable Growth Opportunities – State Profile Bihar. Government of India. Retrieved from <https://www.mofpi.gov.in/sites/default/files/KnowledgeCentre/State%20Profile/Bihar.pdf>
2. Social Studies Journal. (2025). Growth and Challenges of Food Processing Industries in Bihar. *International Journal of Arts, Humanities and Social Studies*, 7(2), 103–106. Retrieved from <https://www.socialstudiesjournal.com/archives/2025/vol7issue2/PartB/7-2-31-400.pdf>
3. Kumar, A., & Mishra, P. (2023). Development of Food Processing Industry in Bihar and its Potential Impact on Mithila Cuisine. *Research Gate Publication*, XXVII (2), 90–96. Retrieved from <https://www.researchgate.net/publication/373900151>
4. Press Information Bureau. (2021). Development of Food Processing Industry in Bihar. Government of India. Retrieved from <https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1706974>
5. India Briefing. (2024, July). Investing in Bihar, India: A State Profile. Retrieved from <https://www.india-briefing.com/news/investing-in-bihar-india-a-state-profile-33641.html/>
6. Bihar Say. (2024, December). Bihar's Economic Leap: Rs. 2181 Crore Investment to Transform Food Processing Sector. Retrieved from <https://biharsay.com/2024/12/03/rs-2181-crores-for-bihar-food-processing-sector>

7. MoFPI / Food Processing India. (n.d.). Food Processing Industry in Bihar. Retrieved from <https://www.foodprocessingindia.gov.in/state/bihar>
8. IBEF. (2025). Industrial Development and Economic Growth in Bihar. India Brand Equity Foundation. Retrieved from <https://www.ibef.org/states/bihar>
9. BPSC Pathshala. (2026, February). Food Processing Industry in Bihar: Growth, Challenges and Budget Support. Retrieved from <https://bpscpathshala.com/food-processing-industry-in-bihar/>
10. IBEF. (2025). Industry in Bihar Presentation and Growth Report. India Brand Equity Foundation. Retrieved from <https://www.ibef.org/industry/bihar-presentation>
11. MoFPI. (2025). Bihar State Food Processing Profile (2024–25 Update). Ministry of Food Processing Industries, Government of India.
12. IBEF. (2024, July). MoFPI Approved 41 Mega Food Parks, 399 Cold Chain Projects, 76 Agro-processing Clusters under PMKSY. Retrieved from <https://www.ibef.org/news/the-ministry-of-food-processing-industries>
13. IMPRI. (2025, March). Strengthening Bihar's Makhana Industry: The Role of Makhana Board 2025. IMPRI Impact and Policy Research Institute. Retrieved from <https://www.impriindia.com/insights/policy-update/nourish-makhana-industry/>
14. India Briefing. (2025, February). Makhana: A Rising Superfood from India. Retrieved from <https://www.india-briefing.com/news/makhana-superfood-india-bihar-union-budget-2025-26-provisions-36032.html/>
15. Ministry of Food Processing Industries. (2024). Lok Sabha Unstarred Question No. 2512: PMKSY and PMFME State-wise Data. Government of India.
16. Press Information Bureau. (2024, July). MoFPI Approved 41 Mega Food Parks, 399 Cold Chain Projects under PMKSY. Retrieved from <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2036980>
17. Invest India. (2024). Makhana: A Rising Star in the Global Health Food Market. Retrieved from <https://www.investindia.gov.in/team-india-blogs/makhana-rising-star-global-health-food-market>
18. Government of Bihar. (2025). Bihar Economic Survey 2024–25. Finance Department, Government of Bihar.
19. Porter, M. E. (1990). *The Competitive Advantage of Nations*. Free Press, New York.

