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Strategic Management in the Indian Rice Industry: Challenges, Opportunities and Future Road Map

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Abstract

India, as the world's second-largest rice producer, plays a pivotal role in global food security (FAO, 2023). It shares 25 percent of global rice production and 40 percent of world rice export production (FAO,2022). However, the sector faces challenges in productivity, value chain inefficiencies, international competitiveness, and sustainability. Despite high production volumes, India's rice sector struggles with low yield per hectare compared to China and Vietnam (World Bank, 2022). Fragmented supply chains, outdated milling technologies, and post-harvest losses (estimated at 12-15%) hinder efficiency (APEDA, 2021). Additionally, stringent international quality standards and trade barriers limit export competitiveness.

The Indian government has taken strategic initiative to cater the difficulties faced by the rice industry and to encourage its stakeholder across the regions by extending institutional as well as financial support. A SWOT analysis reveals strengths such as diverse agro-climatic zones and government support (e.g., MSP, export subsidies), while weaknesses include inadequate infrastructure and over-reliance on monsoon-dependent farming. Opportunities lie in organic and basmati rice exports, whereas climate change and trade restrictions pose threats. Porter's Five Forces analysis indicates high supplier power (due to smallholder dominance) and buyer power (from global price sensitivity).

This study examines strategic management practices in Indian rice industries, identifying key factors influencing performance through SWOT analysis and Porter's Five Forces framework.

Key Words:

Strategic Management, Rice, India, Industry

Introduction

Rice is one of the most important staple foods in the world, feeding billions of people daily and shaping the agricultural, economic, and cultural landscapes of many nations. India, after China, is the second-largest producer of rice globally, but it surpasses all other countries as the world's leading exporter. The geography of rice cultivation within India is diverse, shaped by regional monsoon patterns, irrigation facilities, soil types, and local consumption preferences. At the same time, the international rice trade reflects India's dominant position as a supplier and the complex import needs of nations across Asia, Africa, and the Middle East.

India grows rice in almost all its states, though the intensity and productivity vary regionally.

The crop is largely grown in the kharif season, sown with the arrival of the southwest monsoon and harvested in autumn. In many parts of eastern and southern India, rice is also cultivated in

the rabi season and during the summer/boro period where irrigation permits. Broadly, four rice-growing ecosystems dominate:

1. Irrigated lowland systems, which yield the highest productivity.
2. Rainfed lowland systems, common in eastern India.
3. Rainfed uplands, found in central and plateau regions.
4. Special situations, including flood-prone tracts, deepwater rice, and coastal saline areas.

India's rice production has achieved new records in recent years, underscoring its position as a global agricultural powerhouse. In 2021–22, the country produced 129.47 million tonnes of rice. This increased to 135.76 million tonnes in 2022–23, and further to 137.83 million tonnes in 2023–24. Looking ahead, projections for 2024–25 place production at a record 149 million tonnes, highlighting the consistent growth trend.

This surge in output has not only supported domestic food security but also enabled significant exports and diversification of use. By 2025, around 5.2 million tonnes of rice had been diverted for ethanol production, reflecting the crop's role in alternative energy initiatives. At the same time, exports were expected to reach 22.5 million tonnes, ensuring India's continued dominance in global rice markets.

Government procurement has played a crucial role in stabilizing farmer incomes and maintaining adequate public stocks. In 2023–24, procurement of paddy stood at 46.3 million tonnes. For 2024–25, the government set an ambitious target of 48.5 million tonnes. By February 2025, procurement had already touched 45.84 million tonnes, nearly 5% higher than the previous year, with significant contributions from states like Telangana, Odisha, and West Bengal.

In terms of productivity, India has also made steady progress. In 2024, the country recorded an all-time high average yield of 2,882 kilograms per hectare, though estimates for 2025 suggest a slight dip to 2,859 kilograms per hectare. Seasonal yields show important variations. Kharif rice yields improved from 2,607 kg/ha in 2020–21 to 2,780 kg/ha in 2023–24. Rabi rice, typically grown under assured irrigation, consistently outperforms, rising from 3,541 kg/ha to 3,654 kg/ha by 2024–25. Boro or summer rice also demonstrated strong yields, averaging around 3,302 kg/ha in 2023–24. Overall, the national average improved from 2,717 kg/ha in 2020–21 to 2,882 kg/ha in 2023–24.

The data clearly indicate that irrigated rabi and boro rice contribute significantly to higher national yields, underlining the importance of water management and technology adoption in rice cultivation. These gains highlight how policy support, scientific interventions, and infrastructure have worked together to secure India's leading role in global rice production.

India's rice export basket is a combination of premium basmati rice and large-volume non-basmati rice, each playing a distinct role in shaping the country's global trade profile.

Basmati rice exports from India have shown a steady upward trajectory in both quantity and value over the past three years. In 2021–22, exports stood at 39.4 lakh tonnes, valued at \$3.54 billion. This increased to 45.6 lakh tonnes in 2022–23, generating \$4.79 billion, which reflected a growth

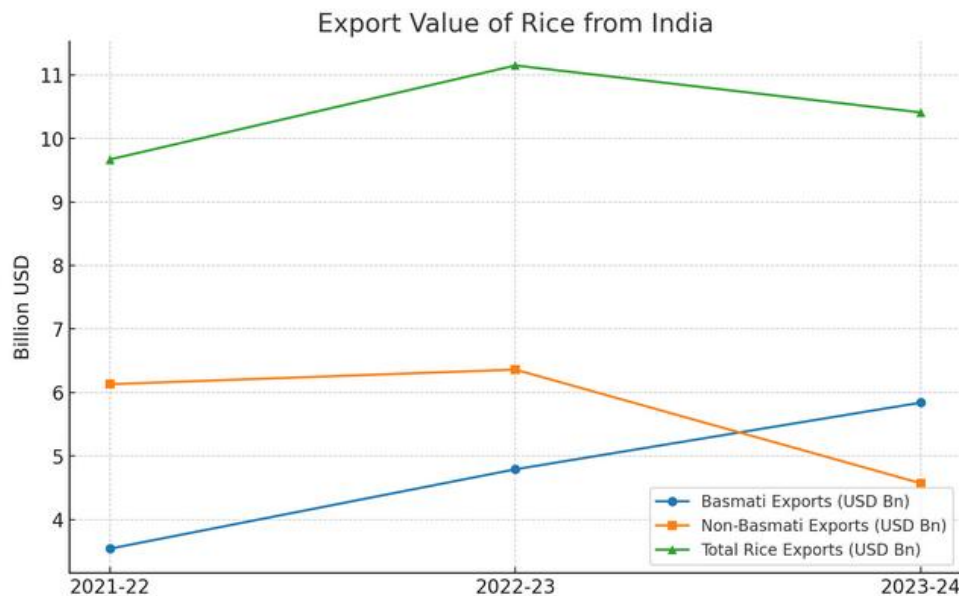
of nearly 35% in value. By 2023–24, exports reached 52.4 lakh tonnes, worth \$5.84 billion, marking another strong 22% growth.

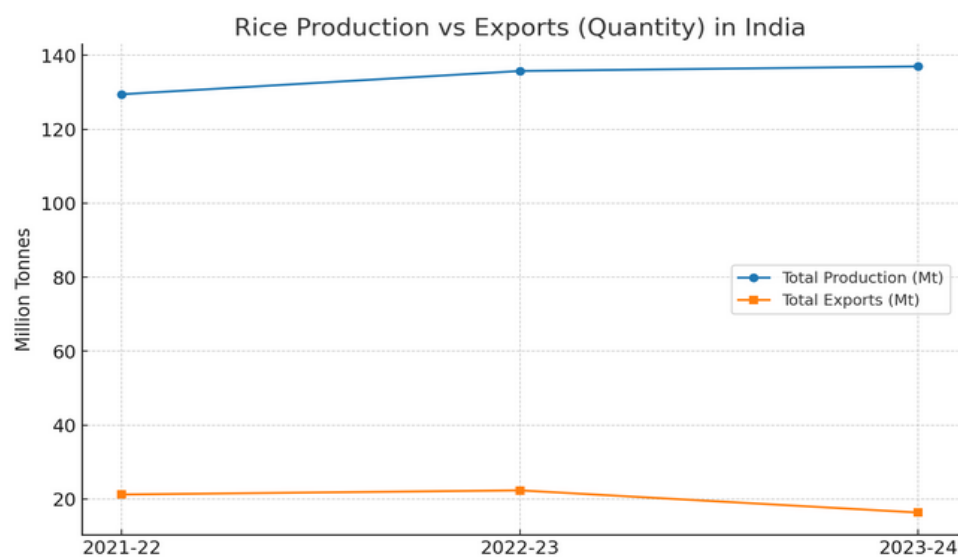
The contribution of basmati rice to India’s overall export basket has also risen gradually, moving from 0.84% in 2021–22 to 1.34% in 2023–24. The major markets for Indian basmati include Saudi Arabia, Iran, Iraq, UAE, Yemen, USA, and the UK. While these countries remain dominant destinations, there has also been a gradual diversification of markets, which points to expanding global demand and reduced dependency on a few buyers.

Non-basmati rice, traditionally much larger in export volume compared to basmati, has experienced mixed fortunes in recent years. In 2021–22, India exported 172.9 lakh tonnes of non-basmati rice, valued at \$6.13 billion. This figure rose slightly to 177.9 lakh tonnes worth \$6.36 billion in 2022–23. However, exports witnessed a steep decline in 2023–24, falling to 111.1 lakh tonnes, valued at \$4.57 billion. This represented a 37% fall in quantity and a 28% drop in value, mainly due to India’s policy of export restrictions on non-basmati rice introduced in mid-2023.

A notable shift has also occurred in the export destinations for non-basmati rice. Traditional markets such as Bangladesh, China, and Nepal, which were once among the largest buyers, saw sharp reductions. In their place, new and emerging markets such as Somalia, Djibouti, UAE, Benin, Guinea, Togo, and Vietnam have gained significance. This diversification suggests resilience in India’s export strategy, as trade is being redirected to alternative markets despite restrictions.

In 2023–24, India exported 163.6 lakh tonnes, nearly 12% of domestic production. Globally, India accounted for nearly 40% of world rice exports on average between 2021 and 2023, rising to 46% in 2023. India’s dominance far exceeds that of Thailand, Vietnam, and Pakistan.





Rice is a staple food consumed across the world, yet only about 10 percent of global rice production enters international trade, as the majority is consumed locally within producing countries.

India leads the world in rice exports, with shipments of about 22 million tonnes. This volume is greater than the combined exports of Thailand and Vietnam, underlining India’s unmatched position in the global market. Thailand follows with 7.5 million tonnes, while Vietnam exported 6.4 million tonnes. Pakistan contributed around 4.6 million tonnes, and other exporters such as the United States, China, Myanmar, and Cambodia each shipped between 1 and 3 million tonnes.

On the import side, China stands out as the largest buyer, bringing in 6 million tonnes despite also being the world’s largest producer of rice. The Philippines imported about 3 million tonnes, while both the European Union and Nigeria accounted for roughly 2.2 million tonnes each. Other important importers included Côte d’Ivoire, Nepal, Saudi Arabia, Iraq, Senegal, Iran, Malaysia, South Africa, and the United Arab Emirates, reflecting the wide geographical spread of demand.

This pattern highlights the contrast in global rice trade: while exports are concentrated in just a handful of countries led by India, imports are widely diversified across Asia, Africa, and Europe. This shows that while exports are concentrated in a handful of countries led by India, imports are spread widely across Asia, Africa, and the Middle East.

Literature Review

Rice is a cornerstone of India’s agrarian economy, securing domestic food supply and reinforcing the country’s global agricultural presence. Basmati rice, in particular, has emerged as a premium commodity owing to its unique quality attributes and high export demand. The literature on India’s rice sector spans production and trade dynamics, supply chain structures, environmental implications, and marketing strategies, collectively underscoring both progress and persistent vulnerabilities.

Indian rice production has expanded substantially over the past five decades. Janaiah (2018) documented a 250% increase in output between 1971 and 2015, driven by high-yielding varieties, irrigation expansion, and institutional credit. This transformation facilitated a fourfold rise in Basmati exports and a tripling of non-Basmati exports, cementing India's role as a global supplier. However, value addition remains limited, with the chain dominated by milling and bagging.

More recent evidence highlights both growth and volatility. Dalal et al. (2024) reported a modest 5% CAGR in Basmati production from 2001 to 2021, compared with 10% in export volume and 15% in export value. Export instability was most pronounced during 2006–2011, reflecting global price shocks and policy restrictions. These findings confirm that India's trade performance is shaped less by production surpluses than by global price movements and domestic policy uncertainty.

Trade determinants extend beyond output levels. Using a dynamic panel gravity model, Kumar et al. (2024) identified GDP, per capita income, and historical trade ties as positive drivers of Indian rice exports, while geographic distance remained a constraint. Exchange rate stability, WTO membership, and domestic policy instruments such as the Minimum Support Price (MSP) enhanced competitiveness, emphasizing the interplay between macroeconomic conditions and institutional frameworks in sustaining export growth.

At the operational level, the rice supply chain remains fragmented and inefficient. Sharma, Giri, and Rai (2013) identified weak forecasting, intermediary dominance, and poor information flows as persistent bottlenecks, resulting in inventory mismatches and high logistics costs. Their proposed model—emphasizing direct farmer procurement, company-owned centers, and ICT-enabled traceability—highlights the role of technology in reducing the bullwhip effect and improving responsiveness.

Parallel insights from Indonesia further demonstrate the role of structured marketing. Prasetyo et al. (2023) found that leveraging the “4Ps” framework (product, price, place, promotion) improved competitiveness among rice producer groups. While contextual, the findings underscore the importance of branding and market positioning, areas where Indian rice processors lag despite global opportunities.

The milling sector illustrates these inefficiencies. While India produced a record 121.46 million tonnes of rice in 2020–21 (Cotecna, n.d.), processing is dominated by 75,000–100,000 largely small-scale mills. Although modernization is advancing—with about 50,000 classified as modern facilities—ownership remains highly fragmented, with 70% single-owner mills concentrated in states such as Tamil Nadu, Andhra Pradesh, and West Bengal (Suri Engineers, n.d.). Uneven modernization reinforces inefficiencies and limits value addition.

India's export expansion carries significant environmental costs. Prasanna (2021) estimated that India accounted for 22.5% of global rice exports during 2010–2019 but contributed 28.3% of the associated water footprint. Methane emissions from exported rice represented between 2.4% and 11.3% of global rice-related emissions, underscoring the ecological burden of water-intensive cultivation in regions already facing groundwater depletion. These findings highlight the trade-off between export competitiveness and environmental sustainability.

One response to these challenges is diversification into higher-value, lower-footprint segments such as organic rice. The *Indian Organic Market and Export Promotion Strategy Report* (APEDA, 2022) identifies robust global demand but points to barriers including certification delays, limited farmer awareness, and weak branding. Strengthening certification systems, investing in farmer training, and developing international marketing channels could enhance India's competitiveness while aligning exports with sustainability imperatives.

The literature collectively portrays a sector characterized by robust output and strong global positioning but constrained by volatility, inefficiencies, and ecological stress. Macro-level analyses emphasize the role of policy and trade determinants, while micro-level studies highlight supply chain fragmentation and weak marketing systems. Environmental research warns that export-led strategies exacerbate resource depletion and GHG emissions. Emerging opportunities in organic and value-added rice remain underexploited due to institutional and infrastructural barriers.

Key research gaps persist. First, there is limited integration between macroeconomic trade studies and micro-level supply chain analyses, restricting holistic understanding of competitiveness. Second, empirical evidence on the adoption and impact of ICT and RFID in rice milling remains scant. Third, socio-economic implications of modernization, particularly for smallholder farmers and rural labor, are underexplored. Finally, the economic potential of organic and processed rice exports remains insufficiently quantified. Addressing these gaps requires interdisciplinary inquiry linking trade, technology, and sustainability within a unified analytical framework.

Government initiative to promote the Strategic growth and Management for the Rice Industry in India

The rice industry occupies a unique position in India's agricultural economy, both as the principal staple food and as a commodity with significant export potential. With annual production exceeding 120 million tonnes, rice forms the backbone of food security for millions of households while simultaneously shaping India's integration into global trade. Unlike other cereals, the marketing of rice in India is embedded not only in supply-demand dynamics but also in welfare objectives, nutritional policy, and environmental imperatives.

Recognising this complex role, the Government of India has undertaken a series of initiatives that transcend conventional production support. These interventions represent a strategic management approach—mobilising state resources to strengthen industry capacity, modernise supply chains, reposition rice as a nutritional and sustainable product, and enhance its competitiveness both domestically and globally. This article analyses the government's initiatives in the rice sector through the lens of strategic growth and management, showing how welfare policies, institutional reforms, and sustainability agendas have been orchestrated to transform the rice industry.

Rice Fortification: Strategic Differentiation through Nutrition

The universal fortification of rice stands out as one of the most ambitious initiatives. Launched as pilot projects in 2019 and scaled nationally by 2021, the programme aimed to integrate fortified

rice into all major food-based welfare schemes, including the Public Distribution System (PDS), Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY), Integrated Child Development Services (ICDS), and the PM POSHAN mid-day meal programme. By targeting 800 million beneficiaries, this policy moved beyond food security to nutrition security, strategically positioning rice as a vehicle for combating anaemia and micronutrient deficiencies.

From a strategic management perspective, rice fortification illustrates product differentiation in a commodity market. Traditionally perceived as a source of calories, rice is rebranded as a health-enhancing staple, a transformation that enhances its value proposition both domestically and in global markets where fortified staples are gaining acceptance.

The government operationalised this initiative through capacity-building: accrediting over 21,000 rice mills for blending, licensing more than 900 fortified rice kernel (FRK) producers, and establishing accredited laboratories under the Food Safety and Standards Authority of India (FSSAI). This ecosystem-building reflects a resource-based strategic approach, creating institutional capabilities that make fortification scalable and sustainable.

However, implementation revealed management challenges. Pilot studies (NITI Aayog, 2022) recorded consumer hesitation, with fortified rice perceived as visually different, slower to cook, or even “plastic-like.” This underscores that strategic initiatives must balance supply-side readiness with demand-side acceptance, highlighting the importance of consumer communication, trust-building, and behavioural adaptation.

Leveraging Welfare Infrastructure: Strategic Penetration

India’s vast welfare delivery system, particularly the PDS, represents one of the largest distribution networks in the world. By integrating fortified rice into this system, the government used an existing strategic asset to ensure market penetration. Unlike conventional marketing that depends on consumer choice, the PDS guarantees uptake across socio-economic strata, thereby normalising fortified rice as a standard commodity.

In addition, the launch of “Bharat Rice”, sold through NAFED, NCCF, and Kendriya Bhandar outlets at subsidised prices (₹29/kg), represents a move toward brand-building in staples. This marks a strategic shift from welfare-driven supply to state-branded retail marketing, leveraging affordability and government trust to create consumer loyalty. Such branding initiatives indicate how the state seeks to expand its role from provider to market shaper, cultivating a distinct identity for Indian rice in retail markets.

Digital Integration and Institutional Modernisation

Digitalisation forms another pillar of the government’s strategy. The National Agriculture Market (e-NAM), launched in 2016, aims to unify India’s fragmented agricultural markets through an electronic platform that enables transparent price discovery, real-time trading, and inter-state flows. For rice, inclusion in e-NAM represents a strategic reorganisation of marketing channels, moving away from intermediary-driven systems toward direct, transparent, and scalable platforms. The government has also recognised that the competitiveness of rice depends on processing quality. The milling sector, fragmented across 75,000–100,000 units, has long been constrained by inefficiencies and outdated technology. Through schemes promoted by the Ministry of MSME,

rice mills are being modernised to improve yield recovery, reduce wastage, and ensure consistent quality. These measures reflect a supply-side strategy of capacity enhancement, enabling rice to meet both domestic consumer expectations and international quality standards.

Together, e-NAM and mill modernisation exemplify strategic initiatives that enhance systemic efficiency, aligning production with market needs and reducing structural bottlenecks.

Sustainability as Strategic Positioning

As global trade becomes increasingly sensitive to environmental concerns, sustainability has emerged as a strategic marketing attribute. India's government has promoted sustainability-oriented practices such as the System of Rice Intensification (SRI), which improves yields while reducing water and input use, and rice-fallow intensification programmes that integrate pulses like grasspea to diversify cropping systems. Supported by agencies such as the Council on Energy, Environment and Water (CEEW) and ICARDA, these initiatives are marketed as pathways toward climate-resilient rice production.

Strategically, this positions Indian rice in alignment with global sustainability narratives, where buyers and regulators increasingly demand low-carbon, water-efficient, and environmentally responsible supply chains. The Orbitas Finance (2022) report highlights the urgency of aligning Indian rice production with climate transition requirements, warning that failure to adapt could reduce competitiveness in export markets. By embedding sustainability into production, India enhances its ability to brand rice not merely as affordable, but as responsible and future-ready.

Nutrition and Value Addition as Market Differentiation

A further dimension of strategic management lies in value-added repositioning. Fortification policies and organic farming promotion have shifted rice from being a low-margin commodity to a differentiated product with health and sustainability attributes. This shift reflects a deliberate strategy to strengthen India's market competitiveness not on price alone, but on value propositions such as nutrition, safety, and ecological soundness.

Moreover, as export markets increasingly favour differentiated staples—organic, fortified, or sustainably certified—the government's initiatives align domestic welfare imperatives with global trade opportunities. Certification, standardisation, and branding support provided by government agencies are thus critical components of a market differentiation strategy.

Strategic Challenges in Implementation

Despite the ambition and breadth of these initiatives, several challenges remain in their strategic execution.

1. Consumer Perceptions and Trust Deficits: Fortified rice has faced acceptance issues, highlighting the importance of marketing communication and consumer education in shaping demand.
2. Uneven Adoption of Digital Platforms: While e-NAM offers systemic efficiency, adoption has been uneven across states, and traditional intermediaries continue to dominate in many rice markets.
3. Fragmented Milling Sector: Small-scale, single-owner mills often lack the capital or incentives to modernise, limiting the reach of government schemes.

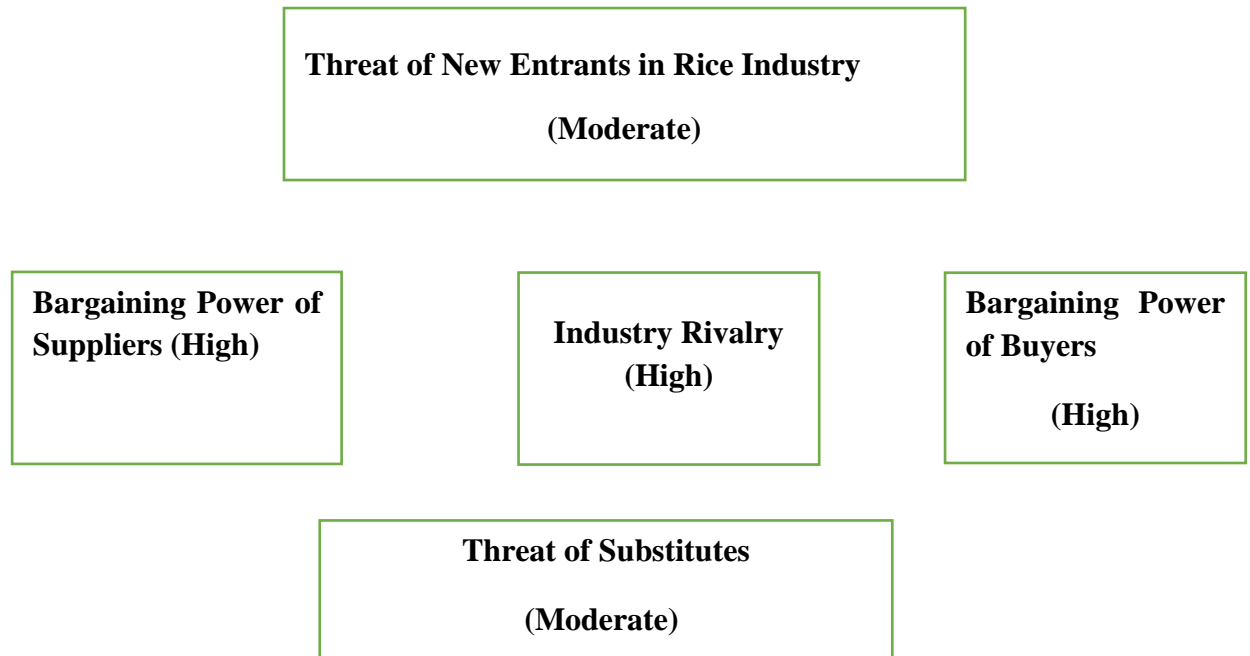
4. Sustainability Scaling: Practices such as SRI and rice-fallow intensification remain confined to pilot projects, with limited mainstream adoption due to awareness and extension gaps.

These challenges reveal the gap between policy formulation and field-level implementation, a recurring theme in strategic management of agricultural sectors. Success will depend on deeper investments in capacity-building, farmer incentives, monitoring frameworks, and consumer engagement.

SWOT Analysis of the Indian Rice Industry

STRENGTH	WEAKNESS
World’s largest rice exporter (40–46% of global exports).	Low productivity (~2.8 t/ha) compared to China and SE Asia.
Second-largest producer with >130 million tonnes annually.	Fragmented and outdated milling sector (75,000–100,000 small mills).
Diverse agro-ecological zones supporting year-round cultivation.	Post-harvest losses (12–15%) and weak logistics infrastructure.
Strong government procurement (MSP and PDS) stabilises farmer incomes.	Policy volatility due to abrupt export restrictions.
Global premium for basmati rice with GI-tag recognition.	Consumer resistance and misconceptions about fortified rice.
Policy support for fortification, organic rice, and ethanol use.	Weak branding of non-basmati rice; remains commodity-driven.
OPPORTUNITY	THREAT
Rising demand in Asia, Africa, and the Middle East.	Groundwater depletion, high water footprint, and methane emissions.
Expansion of organic, fortified, and sustainably certified rice.	Climate change risks: erratic monsoons, rising temperatures.
Adoption of sustainability practices (SRI, AWD, crop diversification).	Competition from Thailand, Vietnam, and Pakistan upgrading their value chains.
Digital platforms (e-NAM, blockchain) to improve transparency and farmer incomes.	Low consumer acceptance of fortified/value-added rice without strong communication.
Branding potential via Bharat Rice and GI-based regional varieties.	Export bans/restrictions damaging India’s credibility in global markets.
Diversification into ethanol blending and ready-to-eat rice products.	Institutional fragmentation across ministries impedes policy coherence.

Porter’s Five Forces for the Indian Rice Industry.



- High: Supplier Power, Buyer Power, Industry Rivalry
- Moderate: Threat of New Entrants, Threat of Substitutes

Policy Recommendations for the Holistic Growth of India’s Rice Industry

The Indian rice industry stands at a critical juncture. While the country is the world’s leading exporter and second-largest producer, structural inefficiencies, fragmented supply chains, and sustainability challenges hinder long-term competitiveness. Strategic management principles—focusing on planning, resource optimisation, institutional coordination, and market orientation—can provide a coherent framework for addressing these gaps. The following recommendations outline a roadmap for holistic growth.

1. Building Consumer Trust in Rice Fortification

The government’s universal fortification initiative positions rice as both a staple and a nutritional vehicle. Yet, consumer concerns about altered taste, texture, and myths such as “plastic rice” have slowed acceptance. A targeted communication strategy is critical, combining mass media campaigns on nutritional benefits, transparent labelling and certification, and grassroots engagement through community leaders and schools. This demand-side alignment will help ensure fortified rice is not just distributed but accepted and valued by consumers.

2. Accelerating Digital Integration and Supply Chain Efficiency

The National Agriculture Market (e-NAM) provides the foundation for transparent rice marketing, but adoption remains uneven. Greater incentives for states and mandi operators, integration of warehousing and logistics services, and blockchain-based traceability can strengthen trust and efficiency. Simultaneously, reducing post-harvest losses—currently 12–15%—requires

investment in cold storage, decentralised procurement centres, and modern warehouses. Together, these reforms reflect a value chain optimisation strategy, reducing waste while improving farmer returns.

3. Modernising Milling Infrastructure

India's milling sector is highly fragmented, with outdated machinery limiting product quality and export competitiveness. Policy should shift toward a **cluster-based modernisation model**, establishing Rice Processing Clusters with modern mills, testing labs, packaging units, and ICT-enabled monitoring. Concessional finance, tax incentives, and PPP models can encourage adoption of automation and energy-efficient technologies. Modernising milling is critical for standardisation, branding, and compliance with international quality norms.

4. Embedding Sustainability into Rice Strategy

Sustainability must become central to rice policy rather than confined to pilot projects. Scaling practices such as the System of Rice Intensification (SRI) and alternate wetting and drying (AWD) through extension services and subsidies can enhance yields while conserving water. Promoting rice-fallow diversification with pulses and oilseeds reduces monocropping risks and improves soil health. A national **Sustainable Rice Certification** scheme would further strengthen India's positioning in climate-sensitive export markets, where environmental credentials increasingly shape competitiveness.

5. Driving Value Addition and Branding

India's rice trade remains largely commodity-driven, missing opportunities for premiumisation. Developing GI-tagged clusters for Basmati and other regional varieties can protect intellectual property and build global recognition. Expanded promotion of fortified and organic rice through APEDA-led international campaigns can leverage health and sustainability trends. Incentives for ready-to-eat, packaged, and processed rice products would create new value streams, jobs, and consumer appeal, shifting the sector from volume-driven exports to differentiated, brand-driven competitiveness.

6. Ensuring Farmer Integration and Equity

Strategic reforms must integrate smallholder farmers, who dominate rice cultivation. Expanding Farmer Producer Organisations (FPOs) can enhance collective bargaining, reduce intermediary dependence, and improve procurement efficiency. ICT-based platforms offering real-time price information, digital payments, and demand forecasting can empower farmers, while training in Good Agricultural Practices (GAP) and climate-smart methods ensures inclusivity. This approach distributes the benefits of strategic growth equitably across the value chain.

7. Enhancing Institutional Coordination and Policy Stability

Policy fragmentation across ministries has led to siloed interventions. Establishing a **National Rice Council** would streamline coordination, align subsidies, and harmonise objectives across production, marketing, and sustainability. Equally vital is the adoption of predictable trade policies. Abrupt export restrictions, particularly on non-basmati rice, have disrupted global supply chains and damaged India's reliability as a supplier. A long-term, stable trade framework will enhance credibility and strengthen India's global leadership.

CONCLUSION

India's rice industry epitomises both the promise and paradox of agrarian transformation. As the world's largest exporter and second-largest producer, the sector anchors global food security while sustaining millions of domestic livelihoods. Yet this scale masks persistent vulnerabilities—relatively low productivity compared to regional peers, fragmented supply chains, outdated milling, and the ecological pressures of water-intensive cultivation. Strategic management, therefore, is not optional but imperative, offering a framework to align production, marketing, and sustainability for holistic growth. The literature demonstrates a sector in transition. Historic gains from high-yielding varieties and irrigation secured India's global leadership, but value addition remains limited. Export performance is undermined by policy volatility, post-harvest inefficiencies, and environmental externalities. At the same time, growing demand for organic, fortified, and sustainably certified rice offers opportunities for differentiation. Capturing these requires a deliberate shift from volume-led expansion to value-driven competitiveness.

Recent government initiatives illustrate this strategic reorientation. Universal rice fortification reframes rice as a nutritional vehicle rather than a calorie staple. Digitalisation through e-NAM and mill modernisation targets systemic efficiency and transparency. Sustainability programmes such as the System of Rice Intensification (SRI) and rice-fallow diversification situate India's rice within global climate discourses, while branding efforts—including Bharat Rice and GI-tagged basmati—demonstrate a move toward premiumisation. Nonetheless, gaps persist between policy ambition and field-level implementation. Consumer scepticism toward fortified rice, uneven adoption of digital platforms, slow mill modernisation, and the limited scalability of sustainability pilots all underscore systemic challenges. Addressing these requires strategic management centred on demand-side communication, systemic integration of technologies, mainstreaming of sustainability, and inclusive farmer participation.

In sum, India's rice sector stands at a crossroads. Continued reliance on volume-driven growth risks ecological degradation and eroded competitiveness, while a coherent strategy anchored in value addition, sustainability, and institutional coordination promises resilient, inclusive, and globally competitive development.

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