



EU SUSTAINABILITY REGULATIONS: IMPLICATIONS FOR INDIA'S RICE EXPORTS

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Abstract

India is the world's leading rice producer, with production reaching 150 million tonnes in 2024-25, and the largest rice exporter, accounting for 29 per cent of global rice exports valued at USD 11.8 billion in 2024. Rice supports millions of smallholder farmers and is a major source of export earnings. The European Union is a strategically important high-value market, particularly for basmati rice, but rice has been excluded from tariff elimination under the India-EU Free Trade Agreement, maintaining duties of around 7.7 per cent and placing India at a price disadvantage against competitors such as Viet Nam, which benefits from preferential FTA access.

The EU has moved well beyond conventional food safety standards towards comprehensive value-chain governance, integrating environmental sustainability, labour due diligence and corporate accountability through the EU Green Deal, farm-to-fork strategy, stricter maximum residue limits, and the Corporate Sustainability Due Diligence Directive. Over 200 rapid alert notifications against Indian rice consignments in the last five years, primarily for banned pesticide residues including tricyclazole and thiamethoxam, reflect persistent compliance gaps and rising reputational risk for India's rice in the EU market.

Drawing on trade data, RASFF notifications, institutional analysis and firm-level case studies, this paper examines India's rice export value chain and compliance ecosystem against these evolving requirements. It identifies six environmental risks, including pesticide residues, greenhouse gas emissions and groundwater depletion, and four labour risks, including migrant worker vulnerabilities and child labour, that require urgent policy attention.

Compliance with environmental and labour standards is no longer market-specific but a universal condition for accessing premium global markets. The study identified institutional, traceability and regulatory gaps that India must address, along with implementing farm-level traceability and utilising the India-EU FTA to secure mutual recognition of its audit and certification systems, reducing compliance costs and strengthening long-term export competitiveness.

Keywords: *Rice, EU sustainability regulations, India-EU FTA, Food safety compliance, Environmental and labour standards, Trade compliance*

JEL Classification: *F13, F18, Q13, Q17*

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Views are the authors' own. Usual disclaimers apply.

List of Abbreviations

APEDA	Agricultural and Processed Food Products Export Development Authority
APMC	Agricultural Produce Market Committee
AWD	Alternate Wetting and Drying
CAC	Codex Alimentarius Commission
CAP	Common Agricultural Policy
CBIC	Central Board of Indirect Taxes and Customs
CS3D	Corporate Sustainability Due Diligence Directive
DA&FW	Department of Agriculture and Farmers' Welfare
DGFT	Directorate General of Foreign Trade
DPPQS	Directorate of Plant Protection, Quarantine and Storage
DSR	Direct Seeded Rice
EIC	Export Inspection Council
EFSA	European Food Safety Authority
ESG	Environmental, Social, and Governance
EU	European Union
EUDR	European Union Deforestation Regulation
FAO	Food and Agriculture Organization
FPO	Farmer Producer Organisation
FSSAI	Food Safety and Standards Authority of India
FTA	Free Trade Agreement
GI	Geographical Indication
GSP	Generalised System of Preferences
ICAR	Indian Council of Agricultural Research
IPPC	International Plant Protection Convention
IRRI	International Rice Research Institute
JNP	Jawaharlal Nehru Port
MRL	Maximum Residue Limit
MSP	Minimum Support Price
MSME	Micro, Small and Medium Enterprises

NABL	National Accreditation Board for Testing and Calibration Laboratories
NPOP	National Programme for Organic Production
ODOP	One District One Product
PPE	Personal Protective Equipment
RASFF	Rapid Alert System for Food and Feed
RCAC	Registration-cum-Allocation Certificate
RCMC	Registration-cum-Membership Certificate
REX	Registered Exporter
SPS	Sanitary and Phytosanitary
SRI	System of Rice Intensification
SRP	Sustainable Rice Platform
UK	United Kingdom
UNEP	United Nations Environment Programme
USA	United States of America
USTR	United States Trade Representative
WHO	World Health Organization
WTO	World Trade Organization

EU Sustainability Regulations: Implications for India's Rice Exports

Arpita Mukherjee and Ria Babbar

1. India's Rice Economy and Emerging Export Challenges in the EU

Rice, which serves both as a staple food for a large share of the population and a major export commodity, is a key pillar of India's agricultural economy. India cultivates a large variety of rice distinguished by aroma, grain size, taste and culinary applications, including premium basmati and numerous non-basmati types. This diversity is supported by over 31 Geographical Indication (GI)-tagged rice products that reflect distinct regional identities and export potential.¹

India's rice production has registered steady growth, particularly in the post-pandemic period. In 2025-2026, rice production crossed 150 million tonnes, driven by area as well as improvements in productivity resulting from better varieties and strong government support.² This growth reflects the dual importance of rice: it is central to national food security while also serving as a vital source of income for millions of farmers in India.

Indian rice exports, particularly basmati, are driven by preference-based demand among diaspora populations in key markets such as the Middle East, the United States of America (USA), the United Kingdom (UK), and the European Union (EU). India's overall

rice exports were approximately USD 11.8 billion in 2024.³ The EU ranks among the top 15 export destinations for Indian rice; it remains a significant high-value market, where product-specific attributes such as aroma and grain elongation reinforce India's niche export positioning.⁴ Despite this, India's rank among the EU's rice import destinations has fallen over time; exporters face rejections on food safety grounds and are likely to face more challenges if sustainability related directives are imposed. On the tariff front, rice has been excluded from concessions under the India-EU free trade agreement (FTA), subjecting exports to tariffs of around 7.7 per cent and reducing price competitiveness vis-à-vis our competitors like Viet Nam.⁵

The EU has higher than internationally approved food safety standards and its non-tariff measures related to food safety and sustainability have become increasingly critical for accessing the EU market. This shift began with the introduction of the EU Green Deal 2019, supported by its core "farm-to-fork" strategy. These frameworks have significantly tightened regulatory standards, particularly on pesticide use and maximum residue limits (MRLs), which lead to increased costs and create new export challenges for Indian rice exporters. Evidence of these challenges is reflected in data from the Rapid Alert System for Food

¹ [India's Geographical Indications Boost Rice Varieties | IASPOINT](#) (last accessed on May 4, 2026)

² <https://www.upag.gov.in> (last accessed on June 23, 2026)

³ [Trade Map - Trade statistics for international business development](#) (last accessed on April 27, 2026)

⁴ [Trade Map - Trade statistics for international business development](#) (last accessed on April 27, 2026)

⁵ [WTO Tariff & Trade Data | Data / IDB - Applied duties](#) (last accessed on May 4, 2026)

and Feed (RASFF), which recorded 200+ notifications for not meeting EU requirements in Indian rice consignments between 2019 and 2025.⁶ These include rejections and alerts categorised as high or potential risk, primarily due to the presence of toxins and residue violations, highlighting persistent compliance gaps and rising reputational risks. Further intensifying these regulatory barriers is the upcoming EU Corporate Sustainability Due Diligence Directive (EUCS3D) compliance obligations, beginning from 2027 onwards. The directive expands the scope of responsibility beyond product standards to include environmental and human rights due diligence across supply chains, posing an additional layer of compliance for Indian exporters targeting the EU market.

These challenges not only constrain India's export potential in the EU but also pose risks of longer-term market displacement, as stringent standards may incentivise a shift towards domestic or alternative suppliers within the EU. This risk is further amplified by the EU's preferential trade arrangements, under which rice imports from several partner countries benefit from zero-duty access, a concession not extended to India.⁷ In this context, strengthening domestic regulatory frameworks, enhancing monitoring systems and improving producers' and exporters' awareness of international standards are essential to sustain India's competitiveness in high-value markets.

1.1 Purpose and Scope of the Study

This paper examines trends in India's rice production and exports, with particular focus on the European Union (EU) market. It analyses the implications of evolving EU food safety and sustainability regulations for India's rice export ecosystem, including issues relating to traceability, testing, certification and compliance governance. The study also identifies emerging risks and institutional gaps and highlights the need for a more integrated and future-ready compliance framework to sustain India's competitiveness in regulated export markets.

1.2 Methodology

This study adopts a qualitative and descriptive analytical approach to assess the implications of evolving European Union (EU) food safety and sustainability regulations for India's rice exports. The analysis is based on a review of secondary data, regulatory documents, institutional frameworks and firm-level evidence. Trends in rice production, trade and export performance were examined using data from the Department of Agriculture and Farmers' Welfare (DA&FW), APEDA, ITC Trade Map, WTO databases, USDA and other official sources. Particular attention was given to India's rice exports to the EU, including the relative performance of basmati and non-basmati rice.

The study reviews key EU regulatory developments affecting agricultural imports, including the EU Green Deal, farm-to-fork

⁶ [RASFF Window - Results](#) (last accessed on May 4, 2026)

⁷ [WTO Tariff & Trade Data | Data / IDB - Applied duties](#) (last accessed on May 4, 2026)

strategy, pesticide-related sanitary and phytosanitary (SPS) measures, and the Corporate Sustainability Due Diligence Directive (EU CS3D). Their implications for India's rice export ecosystem were analysed, focusing on compliance, traceability, testing, certification, environmental sustainability and labour due diligence requirements.

To identify compliance challenges, notifications issued through the EU's Rapid Alert System for Food and Feed (RASFF) were examined to understand recurring causes of border rejections and food safety concerns relating to Indian rice exports.

The paper also draws on company sustainability reports, annual reports, industry initiatives, academic literature and stakeholder consultations to identify key environmental and labour-related risks, and assess emerging adaptation strategies adopted by Indian rice exporters. Based on this evidence, the study proposes policy recommendations to strengthen India's compliance ecosystem and improve the competitiveness of rice exports in increasingly regulated global markets.

1.3 Layout of the Paper

The paper is organised into five sections. Following the introduction, Section 2 examines trends in India's rice production and exports, the structure of global rice trade, and the significance of the European Union (EU) as a high-value but increasingly regulated market for Indian rice exports. Section 3 analyses India's rice export value

chain and compliance ecosystem, focusing on the role of institutions involved in testing, certification, inspection, traceability and export facilitation, while identifying gaps in co-ordination, standards harmonisation and compliance governance.

Section 4 discusses the evolving EU regulatory framework affecting agricultural imports, particularly the EU Green Deal, farm-to-fork strategy, residue-related SPS measures, the European Union Deforestation Regulation (EUDR), and the Corporate Sustainability Due Diligence Directive (EU CS3D). It also highlights emerging adaptation strategies adopted by Indian rice exporters. Finally, Section 5 identifies the major compliance risks and structural constraints within India's rice export ecosystem and emphasises the need for a more integrated and future-ready compliance framework to sustain India's competitiveness in regulated export markets such as the EU.

2. Rice Production and Export Scenario

India, the leading producer of rice, has shown a steady increase in rice production over the past decade, highlighting the importance of the crop to the country. According to the Department of Agriculture & Farmers' Welfare (DA&FW), production increased from 105.4 million tonnes in 2014-15 to a peak of around 154 million tonnes in 2025-26, registering a compound annual growth rate (CAGR) of 3.5 per cent during 2015-2025.⁸

⁸ [UPAg - Unified Portal for Agricultural Statistics](#) (last accessed on June 23, 2026)

Table 2.1: Trends in India's Rice Production and Annual Growth Rates (2014-15 to 2025-26)

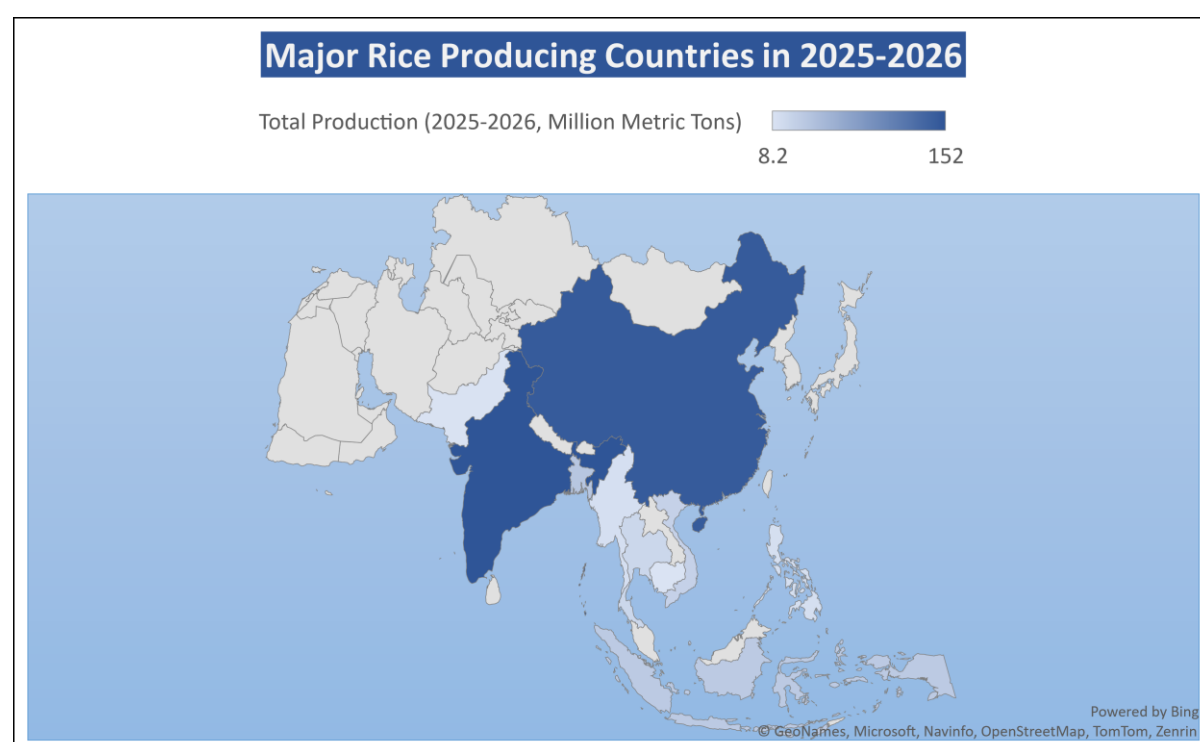
Years	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Production of Rice	105.48	104.41	109.70	112.76	116.48	118.87	124.37	129.47	135.76	137.83	150.18	154.02
Y-O-Y Growth	0.00%	-1.02%	5.07%	2.79%	3.30%	2.05%	4.63%	4.10%	4.85%	1.52%	8.97%	2.56%

Source: DA&FW, [UPAg - Unified Portal for Agricultural Statistics](#) (last accessed on June 23, 2026)

Global rice production is highly concentrated in Asia, with India being the leading producer, followed by China, Bangladesh, Viet Nam and Indonesia. This concentration is because of favourable agro-climatic

conditions, established irrigation systems and long-standing cultivation practices across the South and East Asia belt (see Figure 2.1), which reinforce their central role in global rice supply and food security.

Figure 2.1: Major Rice Producing Countries in 2025-2026



Source: USDA, Foreign Agricultural Service, <https://www.fas.usda.gov/data/production/0422110> (last accessed April 27, 2026)

In contrast, rice production in the EU is relatively limited and concentrated in a few countries, mainly Italy and Spain (refer table 2.2). Although the scale of production is much smaller than in major Asian markets,

the EU has been gradually strengthening domestic production through tariff measures and evolving regulatory frameworks.

Table 2.2: Major Rice Producing countries in the EU in 2023

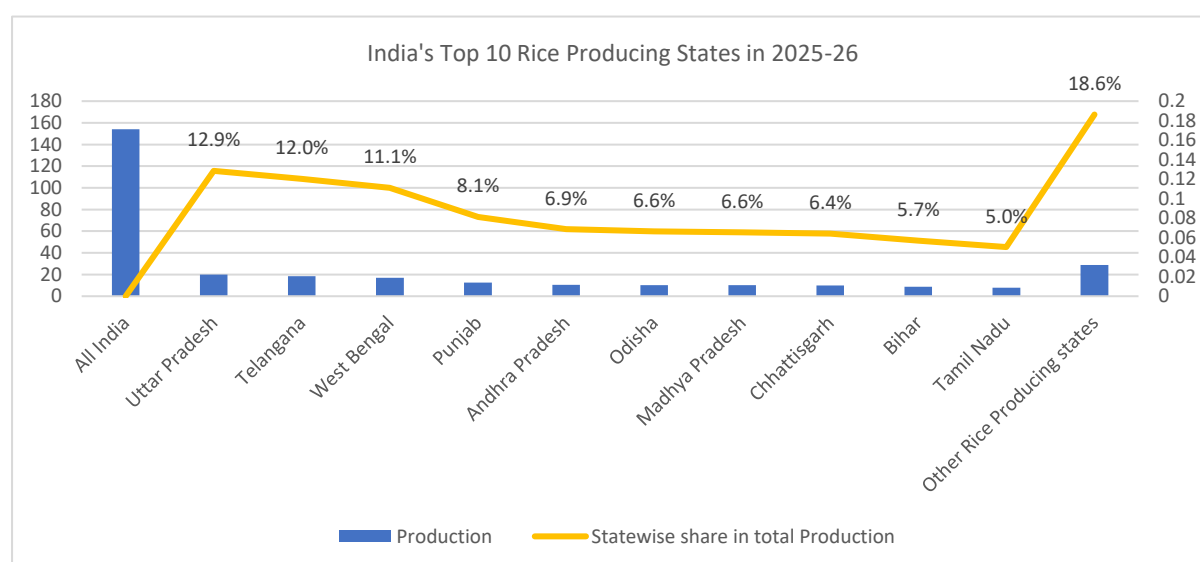
S. No.	Country	Production (Million Metric Tons) in 2023
1	Italy	1.48
2	Spain	0.81
3	Portugal	0.17
4	Bulgaria	0.07
5	France	0.06

Source: <https://www.reportlinker.com/dataset/71061c86e02f5ff83283dd90a9bbe52428eccca2> (last accessed on April 27, 2026)

Within India, rice is grown across several states, as illustrated in Figure 2.2. In 2025-26, Uttar Pradesh accounted for 12.9 per cent of India's rice production, followed by Telangana (12 per cent), West Bengal (11.1

per cent), Punjab (8.1 per cent) and Andhra Pradesh (6.9 per cent). Other rice-producing states together contributed 18.6 per cent of India's total production.

Figure 2.2: State-wise Rice Production in India (2025-26)



Source: DA&FW, [UPAg - Unified Portal for Agricultural Statistics](#) (last accessed on June 23, 2026)

Indian rice is broadly classified into basmati and non-basmati rice varieties. Basmati rice is characterised by its long grain, distinct aroma and superior cooking qualities, making it a premium product in international markets, particularly the EU. It is mainly cultivated in the Indo-Gangetic plains under specific agro-climatic conditions. According to the Agricultural and Processed Food

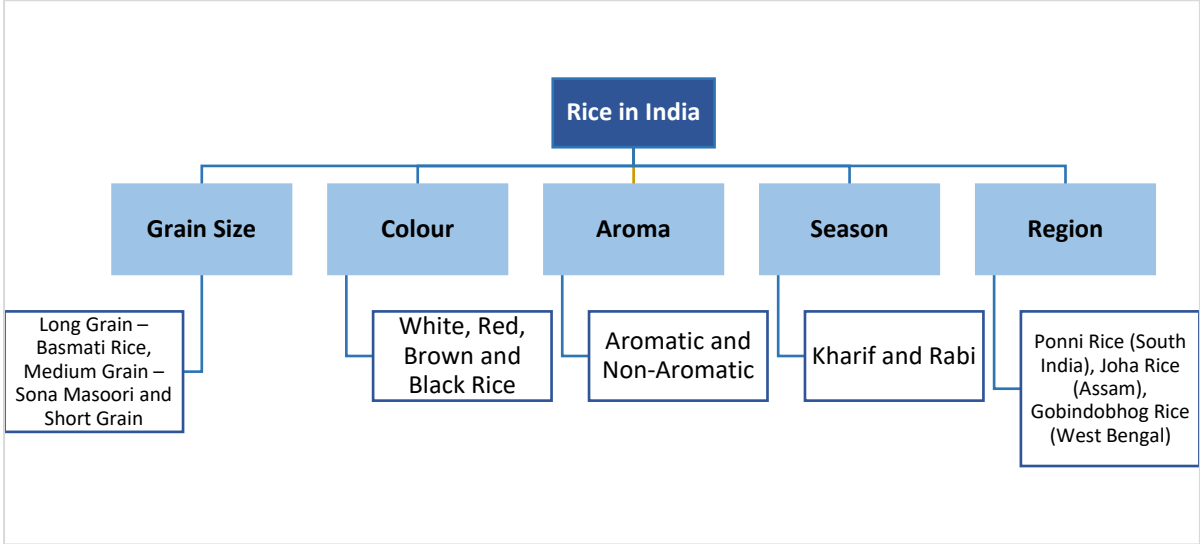
Products Export Development Authority (APEDA), India is the world's leading exporter of basmati rice.⁹ In contrast, non-basmati rice comprises a wide range of coarse, fine, and parboiled varieties that are primarily consumed domestically and exported largely to Asian and African markets.

⁹ APEDA, <https://apeda.gov.in/BasmatiRice> (last accessed on May 9, 2026)

Beyond this broad classification, rice in India is further differentiated across several attributes, including grain size, colour, aroma, seasonal cycle and geographical region. Figure 2.3 illustrates the diversity of

rice varieties based on these characteristics, including long, medium, and short grain varieties; white, red, brown, and black rice; aromatic and non-aromatic rice as well as region-specific and seasonal classifications.

Figure 2.3: Classification of Rice Varieties in India Across Key Attributes and Its Implications for Production Diversity



Source: Author’s compilation from <https://www.ibef.org/indianrice> (last accessed on April 27, 2026)

The diversity of rice varieties is also reflected in government-led initiatives such as Geographical Indication (GI) and One District One Product (ODOP). Several rice varieties have received GI recognition or have been identified under ODOP to promote regional branding, value addition and export promotion as shown in Table 2.3. While GI

focuses on protecting product identity and geographical origin, ODOP supports district-level product development and supply chain enhancement. Together, these initiatives improve the visibility and market positioning of Indian rice varieties in domestic and international markets.

Table 2.3: Some Examples of Rice Varieties Recognised under GI and ODOP Categories.

S. No	Type of Rice	Varieties of Rice	District, State	GI Tag (As on 31.12.2025)	ODOP (As on 19.08.2025)
1	Non-Basmati Rice	Gobindobhog Rice	West Bengal	✓	---
2		Jeerakasala	Kerala	✓	---
3		Sonachud Rice	Buxar/ Rohtas, Bihar	---	✓
4		Laal Chawal	Uttarkashi, Uttarakhand	✓	✓
5		Joha Rice	Assam	✓	---
6		Navara Rice	Kerala	✓	---
7		Chak-Hao	Manipur (Kakching) and Nagaland	✓	✓
8	Basmati Rice	Basmati Rice	Punjab (Taran Taaran)/ Haryana/ Himachal Pradesh/ Delhi/ Uttarakhand/ Uttar Pradesh/ Jammu & Kashmir	✓	✓

Source: Compiled from various sources: APEDA, [NEWLY RELEASED BASMATI VARIETIES.pdf](#) (Last accessed on May 8, 2026), IP India, [IP India - Intellectual Property India | Government of India](#) (Last accessed on March 25, 2026), ODOP, [odop_product_list-Aug-2025.pdf](#) (Last accessed on May 8, 2026)

However, despite supporting branding and market access, GI and ODOP will not be able to increase exports to the EU despite the FTA and the ongoing India-EU GI negotiations unless our exports meet the regulatory and compliance requirements related to evolving EU regulations on the use of chemical fertilisers, pesticide residues, sustainability and labour practices. Lack of traceability to the farm, small farm sizes, variations in cultivation practices, fragmented supply chains and regional differences in institutional capacity continue to pose challenges for uniform compliance, particularly in exports to the European Union.

2.1 India's Rice Exports to the World and the EU

India is the world's leading rice exporter, accounting for 29.1 per cent of global rice

exports in 2024, significantly ahead of Thailand (15.7 per cent), Viet Nam (13 per cent) and Pakistan (10.3 per cent), as shown in Table 2.4. This reflects India's strong position in international rice trade, supported by its large production base, competitive pricing and diversified export portfolio across both basmati and non-basmati rice segments. At the same time, the global rice market remains highly competitive and segmented. Pakistan competes with India in the markets for basmati, while Thailand and Viet Nam maintain strong positions in non-basmati exports. Developed exporters such as the United States and Italy, although accounting for smaller export volumes, continue to benefit from stronger compliance systems and easier access to highly regulated premium markets.

India's export structure reveals an important distinction between basmati and non-basmati rice trade. Basmati rice exports are largely value-driven and concentrated in premium markets, whereas non-basmati

exports are primarily volume-driven and cater to price-sensitive markets in Africa and Asia. This dual export structure has enabled India to maintain dominance across different market segments and geographical regions.

Table 2.4: Leading Rice Exporting Countries and Their Share in Global Exports (2024)

Exporters (Countries)	Value exported in 2024 (Million USD)	Share in world exports (%)
World	40607.54	100
India	11831.48	29.1
Thailand	6372.65	15.7
Viet Nam	5278.33	13
Pakistan	4196.34	10.3
United States of America	2439.63	6
Cambodia	1889.43	4.7
Myanmar	1343.72	3.3
Italy	944.56	2.3
China	776.84	1.9

Source: ITC Trade Map, [Trade Map - Trade statistics for international business development](#) (last accessed on April 27, 2026)

Table 2.5 presents India's major rice export destinations. Saudi Arabia remained the largest export market in both 2014 and 2024, although its share declined from over 17 per cent to around 12 per cent over the decade. Similarly, Iran's share fell sharply to around 6 per cent, reflecting India's increasing diversification of export markets as export volumes expanded. Consequently, the share of other destination countries increased from approximately one-fourth to one-third of total exports. Iraq, Benin, Guinea, Côte d'Ivoire, Togo, and Yemen have emerged as important markets during this period, driven by strong demand for affordable staple grains and relatively less

stringent regulatory requirements. The United States of America also features among the top 15 destinations.

The comparison also reveals a gradual shift in India's export geography, with traditional Gulf markets such as Iran and the United Arab Emirates losing share to rapidly expanding African destinations. In contrast, the share of the European Union (EU-27) declined from 3.15 per cent in 2014 to 2.14 per cent in 2024. While the fall in absolute export value has been modest, its declining share reflects the increasing challenges faced by Indian exporters in complying with the EU's regulatory requirements.

Table 2.5: India's Major Rice Export Destinations (2014 and 2024)

Rank	2014			2024		
	Countries	India's Exports Destination in Million USD	% Share in India's Exports of Rice	Countries	India's Exports Destination in Million USD	% Share in India's Exports of Rice
1	Saudi Arabia	1378.12	17.43	Saudi Arabia	1421.94	12.02
2	Iran, Islamic Republic of	1282.86	16.23	Iraq	943.73	7.98
3	United Arab Emirates	413.34	5.23	Benin	866.82	7.33
4	Bangladesh	322.87	4.08	Iran, Islamic Republic of	709.32	6.00
5	Kuwait	299.76	3.79	United Arab Emirates	495.58	4.19
6	Iraq	270.64	3.42	Guinea	484.97	4.10
7	Benin	256.03	3.24	Côte d'Ivoire	463.77	3.92
8	European Union (EU-27)	248.95	3.15	Togo	418.45	3.54
9	Yemen	244.18	3.09	Yemen	404.59	3.42
10	Sri Lanka	229.95	2.91	United States of America	386.51	3.27
11	Qatar	207.06	2.62	Viet Nam	270.24	2.28
12	Senegal	205.77	2.60	European Union (EU-27)	252.76	2.14
13	United States of America	204.94	2.59	Senegal	251.22	2.12
14	Nepal	178.62	2.26	Somalia	233.65	1.97
15	United Kingdom	174.43	2.21	Kuwait	211.88	1.79
	Others	1988.14	25.15	Others	4016.06	33.94
	Total (World)	7905.65		Total (World)	11831.48	

Source: ITC Trade Map, April 2026, *Trade Map - Trade statistics for international business development* (last accessed on April 27, 2026)

The changing composition of India's rice export destination markets reflects broader structural differences between low-regulation, volume-driven markets and high-regulation, premium markets. While India has successfully expanded exports to Africa and West Asia, penetration into highly regulated markets such as the EU has remained comparatively limited.

Despite accounting for a relatively small share of India's total rice exports, the EU continues to hold strategic importance because its regulatory frameworks increasingly shape global trade standards.

Compliance with EU regulations is becoming important not only to maintain access to European markets, but also to sustain competitiveness in other premium markets that adopt similar standards.

Table 2.6 shows the changing composition of the EU's rice imports from non-EU suppliers between 2015 and 2025 for HS 1006. India remained the largest rice import source for the EU, increasing its share from 11 per cent to 13 per cent over the period. Pakistan, Cambodia, Myanmar and Thailand were the other major suppliers in 2025

Table 2.6: EU Rice Imports from Top 10 Non-EU Suppliers: Import Values and Market Shares, 2015 and 2025

Ranks as of 2025	Exporters	2015		2025	
		EU's Imports (in Million USD)	% Share of EU's Total Imports of Rice	EU's Imports (in Million USD)	% Share of EU's Total Imports of Rice
1	India	231.3	11	550.8	13
2	Pakistan	134.7	6	348.8	8
3	Cambodia	198.4	9	303.7	7
4	Myanmar	79.9	4	287.8	7
5	Thailand	220.7	10	266.9	6
6	Uruguay	23.9	1	166.0	4
7	Argentina	4.5	0	98.1	2
8	Viet Nam	21.2	1	77.9	2
9	Guyana	62.8	3	64.1	2
10	United States of America	27.3	1	36.7	1
EU's Total Imports from the World		2139		4165	

Source: [Trade Map - List of supplying markets for a product imported by European Union \(EU 27\)](#), (last accessed on July 6, 2026)

Note: It needs to be borne in mind that India reports trade data at the 8-digit HSN level (where it is easy to identify varieties such as basmati and non-basmati), whereas the EU reports rice trade at HS 6-digit level. To ensure comparability, the analysis harmonises trade data at the HS 4- and HS 6-digit levels. Accordingly, Table 2.6 is constructed using HS 1006 (Rice).

While India's global rice exports are largely driven by non-basmati rice, India exports basmati rice to the EU. As shown in Table 2.7, the EU's share in India's basmati exports increased from 3.5 per cent in 2022-23 to 7.1 per cent in 2025-26, while its share in India's non-basmati exports remained below 1 per cent throughout the period. Pakistan is India's competitor in basmati rice. Comparing Table 2.6 and 2.7, it can be seen that the export of rice from Pakistan has declined, while India's has increased. This

may be the reason for the rise in basmati rice exports. In contrast, Cambodia and Viet Nam are India's key competitors in the EU's non-basmati rice market and account for a significant share of EU rice imports. Their experience is particularly relevant for India, as both Cambodia and Viet Nam have recorded substantially fewer RASFF notifications than India did, indicating stronger compliance with EU food safety requirements (see Table 2.8).

Table 2.7: India's Global Rice Exports and Exports to the European Union: Basmati and Non-Basmati Rice

Export Year	Basmati Rice			Non-Basmati Rice			Overall			
	India's Bilateral Exports to EU (Million USD)	India's Global Exports (Million USD)	% Share of EU in India's Exports	India's Bilateral Exports to EU (Million USD)	India's Global Exports (Million USD)	% Share of EU in India's Exports	Total Rice Exports to the World	Total Rice Exports to the EU	Share of Basmati in India's Rice Exports to EU (%)	Share of Non-Basmati in India's Rice Exports to EU (%)
2022-23	166.81	4787.5	3.5	37.58	6355.75	0.6	11143.25	204.39	82	18
2023-24	210.97	5837.13	3.6	38.23	4570.05	0.8	10407.18	249.20	85	15
2024-25	236.85	5944.48	4.0	45.19	6527.58	0.7	12472.06	282.04	84	16
2025-26 (April-March)	402.59	5672.77	7.1	33.94	5864.59	0.6	11537.36	436.53	92	8

Source: APEDA, [Build your own Report - \(Principal Commodities\)](#) (last accessed on May 7, 2026).

Table 2.8: Comparison of Major Rice Suppliers to the EU: Market Share (%), Preferential Access, and RASFF Notifications for Export Rejection, 2025

Ranks based on 2025	Exporters	EU's Imported value in 2025 in Million USD	% Share in EU's Imports in 2025	Preferential Access	No. of RASFF Notifications for Export Rejections (1st January-31st December 2025)
1	India	550.8	13.2	X	52
2	Pakistan	348.8	8.4	X	55
3	Cambodia	303.7	7.3	X	1
4	Myanmar	287.8	6.9	X	0
5	Thailand	266.9	6.4	X	0
6	Uruguay	166.0	4	✓	0
7	Argentina	98.1	2.4	✓	0
8	Viet Nam	77.9	1.9	✓	1
9	Guyana	64.1	1.5	X	0
10	United States of America	36.7	0.9	X	0

Source: Compiled by authors from [Trade Map - List of supplying markets for a product imported by European Union \(EU 27\)](#), [RASFF Window - Search](#), [Access2Markets](#) (last accessed on July 7, 2026)

Note: India's Generalised System of Preference (GSP) benefits will expire in 2027, unless renewed. This reduces India's price competitiveness vis-a-vis its competitors, which have zero duty due to their FTAs with the EU.

The differences in RASFF notifications across major exporters suggest that sustained access to the EU market increasingly depends on effective compliance with its food safety requirements. This highlights the importance of strengthening India's

regulatory and compliance ecosystem alongside efforts to expand market access.

India's increasing market share in the EU may also reflect broader trade and industry developments. Although rice remains excluded from tariff liberalisation under the proposed India-EU FTA, the ongoing

negotiations may have contributed to a more favourable trade environment for Indian exporters. At the same time, leading Indian rice companies have strengthened traceability systems and adopted

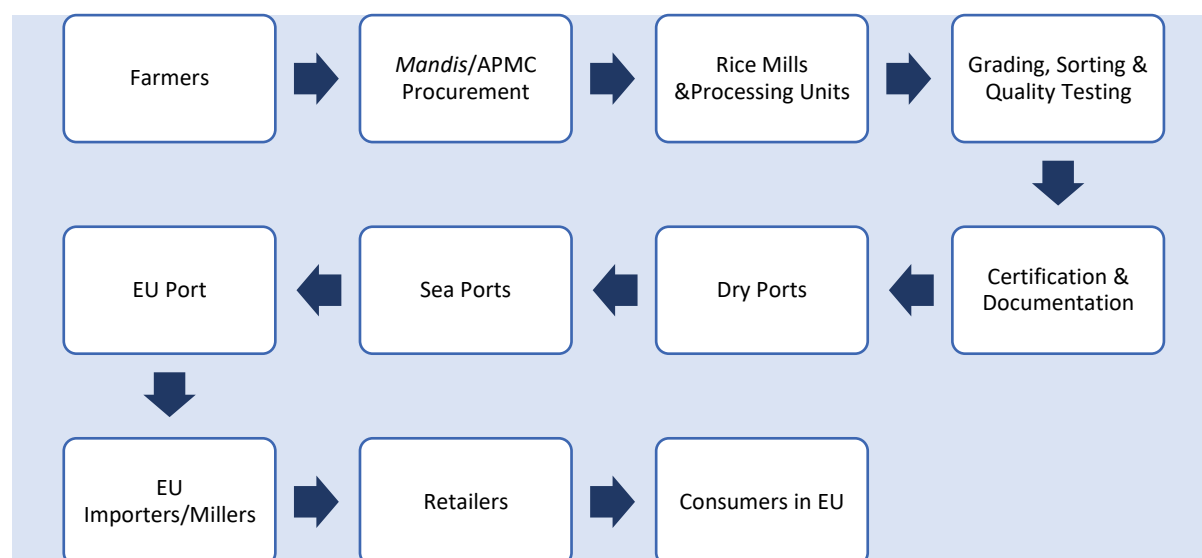
sustainability practices aligned with evolving EU environmental and labour requirements (see Section 4.6). Together, these developments may have supported India's growing presence in the EU market.

3. Export Value Chain and European Market

The export of Indian rice to the European Union (EU) involves a multi-stage value chain comprising procurement, processing, testing, certification, logistics and

distribution networks. Given the stringent regulatory nature of the EU food market, rice consignments undergo multiple stages of quality assessment, residue testing and certification prior to market entry. Figure 3.1 illustrates the supply chain of Indian rice exports to the EU market.

Figure 3.1: Supply Chain of Rice in India



Source: Mukherjee et al (2019), [SPS Barriers to India Agriculture Export.pdf](#), (last accessed on May 4, 2026)

Paddy produced by farmers is channelled through *mandis*, traders, farmer producer organisations (FPOs) and procurement agents, where aggregation and primary quality assessment take place. Following procurement, paddy is transported to rice mills and processing units for cleaning, milling, polishing, grading, sorting, storage and packaging. Export consignments destined for the EU undergo laboratory testing for pesticide residues, aflatoxins,

heavy metals and microbiological contaminants.

Several institutions support the export process at different stages of the value chain. APEDA facilitates the export registration, traceability and certification processes, while the Export Inspection Council (EIC) undertakes inspection, testing and pre-shipment certification. Exporters are also required to comply with FSSAI

standards and complete customs and export documentation through DGFT and customs authorities.

After processing and certification, consignments move through inland logistics networks and dry ports such as Dadri, Tughlakabad, Rewari, Panipat and Ludhiana, which are important aggregation and containerisation hubs for rice exports, particularly from the Indo-Gangetic basmati belt. Shipments are then exported through major seaports including Jawaharlal Nehru Port (JNP), Mundra, Kandla and Chennai Port.

Upon arrival in the EU, consignments undergo customs clearance and compliance verification before distribution through importers, wholesalers, supermarkets, ethnic retail chains and food-service networks. As EU regulations increasingly emphasise traceability, sustainability and MRL compliance, regulatory scrutiny now extends across the entire export value chain

rather than being limited to the final product alone (Mukherjee, et al 2019).¹⁰

3.1 Institutional Roles in the Rice Export Value Chain: Testing, Certification and Compliance

India's rice export compliance system is supported by a broad institutional architecture involving government agencies at the centre and states, export inspection and promotion agencies, laboratories, certification bodies (for organics), and customs and phytosanitary regulators (see Table 3.1). This structure reflects an administrative focus on export quality control. Overlapping responsibilities, functional gaps, weak traceability and poor inter-institutional co-ordination continue to undermine effective compliance monitoring. These challenges have become increasingly significant as export markets such as the EU impose stricter food safety, traceability and sustainability requirements.

Table 3.1: Examples of Roles of Different Government Agencies at the Centre in Rice Exports

Ministry	Agency	Role in Rice Exports
Ministry of Commerce and Industry (MoCI)	Directorate General of Foreign Trade (DGFT)	• Maintains and develops HS Codes for rice. • Issues the importer-exporter code, which is mandatory for all exporters or importers in the country. • Nodal agency for issuance of the European Union (EU) REX (Registered Exporter) number, enabling exporters to self-certify the statement of origin for rice exports to the EU under the GSP (Generalised System of Preferences) scheme.
	Agricultural and Processed Food Products Export Development Authority (APEDA)	• Responsible for export promotion and development of organic and conventional rice. • Oversees the National Programme for Organic Production (NPOP) that certifies organic standards for exports and is recognised by the EU.

¹⁰ Mukherjee, et al 2019 [CRIER PDF Report](#) (Last Accessed on May 10, 2026)

Ministry	Agency	Role in Rice Exports
		• Issues the registration-cum-membership certificate (RCMC) and registration-cum-allocation certificate (RCAC) that are mandatory for exporting rice. • Authorised 50 laboratories for testing rice exports, as of May 2026. • Launched Basmati.Net in 2017 as a web-based traceability system for conventional and organic supply chains. It registers and tracks farmers of basmati paddy in GI area, at agriculture produce markets and commission agents, paddy traders, basmati rice millers and processors, and basmati rice exporters and suppliers in the domestic market.
	Export Inspection Council (EIC)	• Monitors, supervises and audits rice mills for exporters. • Six out of the eight laboratories set up by the EIC and 53 out of the 81 external laboratories approved by the EIC can conduct biological and chemical tests for rice exports. • Has approved 2 external food processing units, cold storages and packing facilities for basmati rice, which meet international food safety and quality standards. • Issues the Certificate of Authenticity for basmati rice exported to EU member states for reduced import duties, verifying parameters such as region of cultivation, confirmation of basmati and quantity/packing. • Issues the Certificate of Inspection for basmati and non-basmati rice, which is mandatory for rice exports to EU member states and select European countries such as the United Kingdom, Iceland and Norway.
Ministry of Agriculture and Farmers' Welfare (MoAFW)	Directorate of Plant Protection, Quarantine & Storage (DPPQS).	• Conducts inspections and certifies rice and other agricultural commodities in accordance with the requirements of importing countries under the International Plant Protection Convention (IPPC), 1951, and issues phytosanitary certificates for rice exports.
Ministry of Finance	Central Board of Indirect Taxes and Customs (CBIC)	• Formulates and implements policies related to customs duties on rice exports. For instance, in 2025, CBIC imposed a 20 per cent export duty on parboiled and GI-recognised rice varieties.

Source: Compiled by the authors from Mukherjee et al. (2019); <https://www.cbic.gov.in/entities/who-we-are>; <https://agriwelfare.gov.in/en/AgricultureTrade>; <https://www.dqft.gov.in/CP/?opt=information-rex-system>; https://apeda.gov.in/Requirement_Export_Rice; <https://content.dqft.gov.in/Website/dqftprod/272450e1-c966-4002-8b28-bee171c1fe0e/Notification%2062%20-English.pdf>; <https://www.eicindia.gov.in/WebApp1/resources/PDF/authenticity.pdf>; <https://ppqs.gov.in/en/divisions/plant-quarantine/import-export-procedure>; <https://foscov.fssai.gov.in/document-required/CL> (Last accessed May 20, 2026).

The rejections of Indian rice consignments by the EU suggests that the key challenge lies not in the absence of regulatory mechanisms, but in the effectiveness, co-ordination, and credibility of the compliance ecosystem and the lack of a single nodal agency accountable for the entire export inspection and control process. This is

evident in the overlapping responsibilities of APEDA and the Export Inspection Council (EIC): APEDA primarily focuses on export promotion, traceability systems and export facilitation, while EIC is responsible for inspection, certification and quality assurance. These overlapping roles are presented in Table 3.2.

Table 3.2: Examples of Responsibilities of APEDA and EIC in Rice Exports

	APEDA	EIC
Products covered	Basmati Rice Non-Basmati Rice Organic Rice	Basmati Rice Non-Basmati Rice
Fixing standards and specifications for rice for exports	✓	✓
Packaging of rice for export	✓	✓
Improving the marketing of rice outside India	✓	-
Promotion of production and development of export-oriented rice	✓	-
Collection of statistics from the owners of factories or establishments engaged in the production, processing, packaging, marketing or export of rice	✓	
Training to enhance capability of manpower to meet international requirements and keep abreast with latest technological advancements.	✓	✓
Specify the type of quality control and/or inspection to be applied to such commodities.	-	✓
Build global credibility through credible and efficient inspection and certification system to instil confidence in importers as well as regulatory authorities of India's trading partners about the quality and safety of Indian products.	-	✓
To obtain recognition for EIC's Export Certification System from India's trading partners through Equivalence Agreements, to participate in international forums and protect Indian interests.	-	✓
To provide state-of-the-art testing facilities.	-	✓
Export inspection and certification infrastructure based on International Standards for Certification Authority in consonance with WTO requirements.	-	✓

Source: Compiled by the authors from <https://apeda.gov.in/about-us>;
<https://www.eicindia.gov.in/WebApp1/pages/menuInfo/aboutUs.xhtml>;
<https://www.eicindia.gov.in/WebApp1/pages/menuInfo/visionAndMission.xhtml>;
<https://apeda.gov.in/OrganicProducts> (Last accessed on May 21, 2026).

Registering with both APEDA and EIC imposes a dual cost and compliance burden on exporters. The absence of mutual recognition arrangements for testing and certification between India and the EU, including for organics, further compounds this burden, as exporters must undergo separate testing and certification processes in both jurisdictions.

India is undertaking initiatives to modernise export governance through digital traceability and certification systems. APEDA's Basmati.Net platform seeks to strengthen farm-to-export traceability by digitally linking farmers, traders, millers, processors and exporters within the basmati supply chain. Similarly, the National Programme for Organic Production (NPOP) incorporates a robust traceability framework for organic produce. However, unless these systems receive EU recognition, the compliance burden on exporters remains the same.

A key concern is that while FSSAI standards are aligned with international standards such as the Codex Alimentarius Commission (CAC), the EU requirements are substantially

more stringent than Codex. Compliance with domestic standards alone does not guarantee product acceptance in the EU market. Exporters and manufacturers must consequently navigate multiple compliance frameworks simultaneously, particularly when targeting highly regulated markets such as the EU.

Producers, millers, exporters and testing agencies bear the burden of meeting the standards of the domestic market and that of different export markets, with the EU being one of the most rigid and complex export markets. The EU has EU level requirements, country specific requirements and private standards. Some laboratories may lack the equipment or skilled manpower needed to meet these different standards and requirements.

Table 3.3 shows that although all laboratories authorised by APEDA and EIC are accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL), not all are notified by the Food Safety and Standards Authority of India (FSSAI) for food testing.

Table 3.3: Network of Laboratories for Rice Export Testing

	EIC/Export Inspection Agency	EIC/Export Inspection Agency (External)	APEDA
Total set up/authorised	8	81	126
Can test rice	6	59	50
FSSAI notified and can test rice	4	51	47

Source: Compiled by the authors from

<https://fssai.gov.in/upload/uploadfiles/files/final%20validity%20order%20april%202026.pdf>;

https://www.eicindia.gov.in/WebApp1/pages/menuInfo/Lab_List.xhtml;

<https://itrack.apeda.gov.in/MasterReport/ModuleVsProductForWeb.aspx?RequestID=66355182&PageID=5&moduleid=161> (Last accessed May 21, 2026).

This creates a disconnect between domestic food safety governance and export-oriented testing systems. While FSSAI does not directly regulate exports, laboratories recognised under its framework are expected to comply with domestic food safety oversight and testing protocols. Parallel laboratory systems operating under different institutional authorities, therefore, weaken overall regulatory coherence and consistency in testing standards, a key factor behind India's persistent EU export rejections linked to banned chemicals in rice, which adequately equipped laboratories with skilled manpower could readily detect. Overall, India's rice export ecosystem demonstrates substantial institutional depth through dedicated export promotion agencies, certification systems, traceability mechanisms, laboratory networks and standards frameworks. However, repeated EU notifications and border rejections indicate that institutional presence does not automatically translate into institutional effectiveness. There is a pressing need to enforce standards strictly and bring uniformity to export testing procedures. Further, none of the export control agencies are mandated to address environmental and labour standards, which are now embedded in EU regulations such as the EUCS3D. In this context, it is important to understand how the EU regulation has evolved over time moving beyond food safety to broader sustainability and labour concerns and how these apply specifically to rice, including provisions designed to protect EU producers and millers.

4. Emerging EU Sustainability and Food Safety Regulations: Implications for Indian Rice Exports

The European Union's (EU) regulatory framework for agricultural imports has evolved beyond conventional sanitary and phytosanitary (SPS) measures towards broader sustainability and supply-chain governance requirements. In the case of rice, domestic varieties and millers have a special place in the regulations.

Earlier, market access was largely determined through compliance with food safety standards relating to pesticide residues, contaminants, hygiene and traceability. However, recent EU regulations increasingly integrate environmental sustainability, climate objectives, due diligence obligations and corporate accountability into trade governance.

For Indian rice exports, this transition is particularly significant because compliance increasingly extends beyond the final product to include traceability, sustainability and supply-chain accountability across the value chain. These requirements pose important challenges for India's rice sector, which is characterised by fragmented landholdings, multiple intermediaries and decentralised procurement systems.

Four regulatory developments are especially relevant in this context: (i) the EU Green Deal and farm-to-fork strategy, (ii) the European Union Deforestation Regulation (EUDR), (iii) stricter maximum residue limits (MRLs), and (iv) the Corporate Sustainability Due Diligence Directive (EUCS3D). They provide examples of the complex export market that our exporters have to deal with.

4.1 EU Green Deal and Farm-to-Fork Strategy

The EU Green Deal provides the overarching framework for the EU's climate-neutral and sustainability agenda. Within agriculture, the farm-to-fork strategy seeks to reduce pesticide use, strengthen sustainable food systems, improve traceability and lower the environmental footprint of agricultural production. Although framed as internal EU policies, their implications increasingly extend to agricultural imports. Exporters are facing greater expectations relating to pesticide management, environmental sustainability and supply-chain transparency.

For Indian rice exports, these developments are particularly significant because rice cultivation is input-intensive and associated with well-documented concerns such as high pesticide use, soil degradation, methane emissions, crop residue burning and excessive water consumption as reflected in both academic literature and media coverage (see sources below).¹¹ Consequently, Indian exporters face heightened scrutiny in the EU, where the sector is classified as high-risk within EU market risk management frameworks.

4.2 EUDR and Rice – The New EU Focus on Domestic Production for Food Security

The EUDR, adopted in June 2023 (Regulation EU 2023/1115) requires businesses to demonstrate that the products they sell or

export to the EU do not come from land that was deforested or degraded after December 31, 2020. This requires exporters to implement geolocation-based traceability requirements to ensure that the product does not originate from deforested land. Rice is not covered under the EUDR.

In fact, the EU is seeking to increase domestic rice production and reduce import dependence for food security purposes. EU domestic producers face rising production costs and intense competition from imports.¹² Interestingly, the EU rice sector has progressively adopted sustainability standards over the years, including water-saving techniques such as alternate wetting and drying (AWD), promoted since the 2010s, biodiversity protection measures under successive Common Agricultural Policy (CAP)¹³ reforms (2003, 2013 and 2023-2027), greenhouse gas emission reductions and a targeted 50 per cent reduction in chemical pesticide use by 2030 under the farm-to-fork strategy (2020).

4.3 Pesticide-Related SPS Measures and Residue Compliance Challenges

Among the SPS measures affecting Indian rice exports, the European Union has banned or withdrawn approval for several pesticides commonly used in rice cultivation, including Tricyclazole, Carbendazim, Imidacloprid, and Thiamethoxam. Tricyclazole was banned in 2016 through Commission Implementing Regulation (EU) 2016/1826¹⁴ while approval for

¹¹ [High pesticide content a drag on rice exports - The Tribune](#) (last accessed on May 29, 2026); [India rice export to EU: Few cases of toxic substance aflatoxin detected](#) – Deccan Herald (last accessed on May 29, 2026), and Bhardwaj & Dutta (2025) (last accessed on May 29, 2026).

¹² [2025 COPA - Meeting of the EU rice industry 27 June](#) (last accessed on May 29, 2026)

¹³ [Sustainable agricultural practices and methods - Agriculture and rural development](#) (last accessed on May 29, 2026)

¹⁴ [EUR-Lex - 52023IP0474 - EN - EUR-Lex](#) (last accessed on May 29, 2026)

Carbendazim was not renewed in 2014. Similarly, approvals for the neonicotinoid insecticides Imidacloprid and Thiamethoxam were withdrawn between 2018 and 2020 owing to concerns related to human health, environmental safety and pollinator protection. Consequently, if a consignment is found with these pesticides' residues, it will be stopped at the customs. However, as some of these pesticides continue to be used in India, Indian consignments face frequent rejections as shown in Section 5.

These challenges are particularly acute for India because some competing countries, such as Cambodia, are able to meet the EU's requirements despite being classified as least developed countries (see Table 2.8). This is because when the EU banned chemicals like Tricyclazole, Cambodia immediately banned it and, under an EU capacity building programme, trained its farmers on the right pesticides to use (Mukherjee et al., 2019, FAO Cambodia/EU-supported rice sector programmes). In India, most of the pesticide issues are at the farm level. Farmers are not often aware of the chemicals banned in key export markets, and hence they are unable to earn higher income from export (Mukherjee et al., 2019). In India, ensuring uniform adherence to residue standards across the supply chain remains institutionally challenging, with multiple export control agencies undertaking testing and certification functions and no single nodal authority accountable for residue-related consignment rejections.

4.4 Corporate Sustainability Due Diligence Directive (CS3D)

The Corporate Sustainability Due Diligence Directive (CS3D), which entered into force on July 25, 2024, and is due to apply to in-scope companies from July 2029 (following the Omnibus I amendments of March 2026), represents a major shift in EU regulatory governance by extending compliance obligations beyond product safety towards environmental and human-rights due diligence across supply chains (backward and forward). The Directive applies to EU companies with more than 5,000 employees and a net worldwide turnover exceeding €1.5 billion, and to non-EU companies generating more than €1.5 billion in net turnover within the EU. The EU member states will transpose the Directive into national law by July 26, 2028.

European importers subject to CS3D are likely to impose additional requirements on exporters including sustainability reporting, supplier audits, traceability and environmental disclosures. Failure to fulfil their own due diligence obligations exposes in-scope EU companies to administrative fines capped at 3 per cent of their global net worldwide turnover, enforced at national level.¹⁵

Indian rice exporters typically supply EU-based rice importers and processors that fall below the CS3D size thresholds. However, these processors supply large retail chains and e-commerce platforms such as Carrefour (324,750 employees; €84 billion revenue, 2024) and Amazon EU (net EU turnover well exceeding €1.5 billion) that are

¹⁵ [EU Approves Omnibus I: CSRD and CS3D | ReedSmith](#) (last accessed on May 29, 2026)

within the Directive's scope.¹⁶ CS3D requires these large buyers to conduct due diligence across their supply chains, meaning compliance obligations flow down contractually to processors, importers and ultimately to Indian exporters.

4.5 Emerging Compliance Challenges for Indian Rice Exports

Collectively, the EU Green Deal and related regulatory developments including the MRL reforms and CS3D (summarised in Table 4.1),

reflect a broader transformation in how the EU governs agricultural imports, shifting the compliance burden onto supplying countries. Exporting nations are increasingly competing with each other to meet these evolving requirements. In effect, EU policies are shaping global agricultural trade governance, a dynamic made more consequential by the fact that the WTO dispute settlement mechanism remains non-functional, leaving exporting countries with limited multilateral recourse.

Table 4.1: Evolution of EU's Regulations

Dimension	Earlier EU Regulatory Emphasis	Evolving EU Regulatory Approach
Trade	Tariff and non- tariff measures. Tariff was implemented to support EU millers while non-tariff measures were related to food safety standards. There were country standards and private standards related to issues like the environment.	Tariffs continue but it is now increasingly EU-led regulations that go beyond traditional trade barriers to cover environment issues, labour issues and more sustainable production, and support sustainable businesses.
Regulation focus	Final product compliance (SPS: residue, quality, hygiene)	Entire value-chain compliance aligned with the EU's farm-to-fork strategy, which is a core component of its Green Deal Policy.
Governance approach	Border-centric enforcement	Pre-border + post-border value-chain governance, combined with upstream and downstream due diligence obligations.
Environment/ Climate Change/ Sustainability and Trade integration	Limited or indirect environment/climate change linkage to trade compliance	Embedded environmental, climate and sustainability requirements through regulations e.g., EU Green Deal (2019), farm-to-fork strategy (2020), EU CS3D.
Social dimension	Minimal labour/human-rights linkage in trade compliance	Labour and human-rights due diligence embedded, e.g., CS3D (Directive 2024/1760) requires supply-chain due diligence on labour standards for all imports.
Compliance responsibility	Exporter-centric compliance burden	Shared responsibility across all players in the supply-chain – producers, exporters, importers and retailers. Large companies have to work with their supply chain partners and support SMEs to ensure compliance. EUCS3D aims to impose an obligation and penalty on large companies and, through them, on their supply chain partners.

Source: Compiled by the authors from EU regulatory frameworks (Green Deal, [european-green-deal](#); Farm to Fork Strategy, EUDR [2019-2024/european-green-deal](#); CS3D https://commission.europa.eu/topics/business-and-industry/doing-business-eu/sustainability-due-diligence-responsible-business/corporate-sustainability-due-diligence_en) and secondary literature.

¹⁶ [Carrefour SA: Number of Employees 2012-2025 | CRRFY | MacroTrends](#) (last accessed on May 29, 2026)), [Amazon grows 8.7% in Germany, 12.7% in UK](#) (last accessed on May 29, 2026)

Some Indian rice manufacturers and exporters have begun adopting digital traceability systems, sustainability initiatives and ESG-linked governance frameworks in response to evolving EU regulatory requirements. The EU importers are also working alongside exporters and multi-stakeholder groups have been established to address the environment and social requirements, many of which currently fall outside the mandate of India's export control agencies. These initiatives are discussed below.

4.6 Corporate Adaptation Strategies and Multi-stakeholder Partnerships to Address EU Import Requirements

In response to EU requirements, some Indian rice exporters have begun adopting digital procurement systems, residue-monitoring mechanisms, sustainability certifications, and ESG-linked governance practices as shown in Table 4.2. These reflect a gradual shift from product-level compliance towards integrated value-chain governance. However, adoption remains uneven – only a few large exporters with greater technological and financial capacity are in a position to adapt to the EU environment and social requirements; smaller exporters may not have the information, or the capacity, technology and

finance. There is a fear that small and mid-sized farmers, manufacturers and exporters may be left behind due to rising compliance rigidity and their highly fragmented supply chain. As shown in Table 4.2, large firms understand the requirements and are preparing for it by establishing product traceability and implementing measures. They have also identified the risk and set targets and measures to mitigate them. While EUCS3D requires large EU companies to work with their supply chain partners, companies prefer to work with large supply chain partners. However, establishing direct farm-to-firm linkages remains a challenge in India for foreign companies. This would have been easier with the implementation of the Farm Bills, 2020, which aimed to promote direct procurement and contract farming outside the traditional *mandi* system.¹⁷ Some companies in key import markets such as the UK are working in developing countries like India for sustainable rice sourcing. Tilda Limited, a leading international rice company sourcing basmati rice from India, has partnered across Haryana, Punjab and Uttar Pradesh under its Responsible Growing Programme, promoting water-efficient cultivation, lower input use, and improved traceability to build more sustainable and export-ready rice supply chains (Tilda Impact Report, 2025).

¹⁷ [Farm Bill 2020](#), (last accessed on May 30, 2026)

Table 4.2: Firm-Level Compliance Alignment with Emerging EU Regulatory Expectations in India's Rice Export Sector

EU Regulatory Requirement	Company	Targets and Status
Traceability and supply-chain transparency (farm-to-fork)	Lal Chand Tirath Ram Foods Ltd.	Target (2030): 50,000 MT of sustainably sourced paddy. Status (FY2024-25): 8,100 MT sustainably sourced paddy procured through digital farm-to-fork procurement system.
	Khushi Ram Behari Lal Ltd.	Commitment: Strengthen supply-chain transparency and traceability. Status: Transport Management System (TMS) enables real-time vehicle tracking and compliance documentation.
Pesticide residue compliance (EU MRL requirements)	Lal Chand Tirath Ram Foods Ltd.	Target (2030): Train 100,000 farmers in sustainable rice cultivation. Status (FY2024-25): 19,305 farmers trained through SRP and precision agriculture programmes.
	Khushi Ram Behari Lal Ltd.	Commitment: Maintain international food safety and responsible sourcing standards. Status: BRCGS ETRS certification (5/5 score), FSSC 22000, BRC Issue 9 and SQF Edition 9 certified.
Environmental sustainability (EU Green Deal; farm-to-fork)	Lal Chand Tirath Ram Foods Ltd.	Targets (2030): 100% GHG reduction and 82% recyclable packaging. Status (FY2024-25): 58.5% green electricity and 79% recyclable packaging.
	Khushi Ram Behari Lal Ltd.	Commitment: Increase renewable energy use and maintain plastic neutrality. Status: 90% renewable power consumption, 149.15 MW renewable energy portfolio, and 100% plastic neutrality achieved.
	Amira Nature Foods Ltd.	Environmental management and pollution prevention systems implemented.
ESG governance and sustainability reporting (CS3D)	Lal Chand Tirath Ram Foods Ltd.	Sustainability reporting framework and supplier-monitoring mechanisms disclosed through ESG reporting.
	Khushi Ram Behari Lal Ltd.	SEDEX registered; zero human-rights complaints; over 11,157 employee training hours completed.
	Amira Nature Foods Ltd.	Integrated EHS management systems and stakeholder reporting mechanisms.
Worker safety and social compliance (CS3D social dimension)	Lal Chand Tirath Ram Foods Ltd.	Target (2030): 30% women directors. Status (FY2024-25): 22% women directors.
	Khushi Ram Behari Lal Ltd.	Commitment: Continue social welfare and community development initiatives. Status: Zero human-rights complaints, CSR expenditure above ₹25 crore, and 6.3 million+ mid-day meals served.
	Amira Nature Foods Ltd.	Workplace safety systems, labour welfare initiatives and operational risk assessments implemented.

Source: Compiled from the annual reports, <https://ltfoods.com/esg/agriculture>, <https://krblrice.com/wp-content/uploads/2024/08/KRBL-Annual-Report-2024.pdf>, <https://www.amira.net/about/corporate-governance/> (Last accessed on October 28, 2025).

Notes: Where the targets are not reported, it is missing.

Several multi-stakeholder initiatives are being implemented in India to promote sustainable rice production and address environmental, social, traceability and labour-related risks across the rice value

chain (see Box 4.1). These initiatives support the adoption of responsible production practices and can help exporters respond to evolving sustainability expectations in the EU.

Box 4.1: Multi-stakeholder Initiatives to Promote Sustainable Rice Cultivation

Sustainable Rice Platform (SRP): Established in 2011 by the United Nations Environment Programme (UNEP) and the International Rice Research Institute (IRRI), SRP promotes sustainable rice cultivation through voluntary standards covering water management, agrochemical use, traceability and labour practices. Although not mandated under European Union law, SRP principles align with the sustainability objectives of the European Green Deal, farm-to-fork strategy, and Corporate Sustainability Due Diligence Directive (CS3D). Indian members of this platform include LT Foods Limited, Landmark Agri Exports Private Limited, Sarveshwar Foods Limited, Flying Trade India Private Limited, and Sharsid Overseas Private Limited.

GLOBALG.A.P.: It is a globally recognised certification system for good agricultural practices covering food safety, traceability, environmental sustainability and worker welfare. While voluntary, its requirements align with European buyer expectations regarding responsible sourcing and farm-level compliance. Several Indian rice exporters and farmer groups supplying premium export markets have adopted GLOBALG.A.P. certification, including exporters such as LT Foods Limited and producer networks supported by certification agencies including OneCert International Private Limited and Control Union India.

Sustainable Agriculture Initiative (SAI) Platform – Farm Sustainability Assessment (FSA): The FSA, developed by the Sustainable Agriculture Initiative (SAI) Platform, is widely used by multinational food companies and European retailers to evaluate environmental, social and economic sustainability performance at the farm level. In India, companies such as LT Foods Limited and Olam Agri Limited have incorporated sustainability assessment and traceability systems aligned with international buyer requirements, reflecting the broader principles promoted through the FSA framework.

Fairtrade Standards: Developed by Fairtrade International, Fairtrade Standards promote fair labour conditions, environmental stewardship and responsible sourcing. The standards support social due diligence requirements increasingly emphasised under the EU CS3D. India is among the largest Fairtrade-certified producer countries, with certified rice producer organisations and exporters supplying international markets. Examples include the Fairtrade-certified Small Farmers Agribusiness Consortium (SFAC)-supported producer groups and farmer organisations engaged in certified rice exports.

Source: Compiled from various platforms, [fairtrade net](#), [sustainable rice](#), [global gap](#), [saipatform](#) (last accessed on May 31, 2026)

Most Indian companies adapting EU requirements are large companies. SMEs and small farmers are at increasing risk of

being unable to meet these requirements. Smaller farmers and manufacturers are likely to be excluded from the export supply chain

not only by stricter EU policy but by gaps in India's own policies that prevent direct sourcing and supply chain connects, and export control processes.

The information from the sustainability reports of various companies, their websites and other case studies show that many exporters have been able to identify the environment related risks and some have also been able to prioritise the risk and set targets for mitigation. However, labour risks have not been clearly identified and prioritised. This is a cause for concern. Indian exports face labour risk not only in the EU but also in other key markets like the USA. For example, US trade authorities, concerned over forced labour and child labour in global agricultural supply chains, including rice, have contributed to heightened scrutiny of Indian exports. In June 2026, the USTR¹⁸ proposed a 12.5 per cent additional tariff on Indian imports under Section 301, stating that India had not effectively implemented or enforced measures to prevent trade in goods associated with forced labour.

Overall, addressing the environment and labour issues requires co-ordinated institutional interventions, starting from conducive policies to support EU companies to working with their supply chain partners, capacity building, training, technology

implementation, having laboratories with equipment and staff to test for the requirements, moving from an export control system to farmer and SME support system, and identifying quality auditing and testing agencies based in India jointly with the EU so that the cost of compliance gets reduced. However, before any of these can be done, it is important to identify the core environment and labour risks, which, based on existing literature and data, are listed below.

5. Key Risks, Opportunities, and Policy Recommendations for India's Rice Exports

India's rice sector faces many environmental and labour risks that are well-documented and researched. As mentioned in Section 4.3, the EU has banned several chemicals due to the health risks associated with their use, while some chemicals are not banned but are subject to strict residue limits. Indian rice consignments continue to face rejection on grounds of use of banned chemicals and/or not adhering to the MRLs. Between 2021-2025, several serious and potentially serious notifications were raised on the EU's Rapid Alert System for Food and Feed (RASFF) portal for traces of banned chemicals or the presence of pesticide residue above the MRL limits in Indian rice (see Table 5.1).

¹⁸ <https://ustr.gov/about/policy-offices/press-office/press-releases/2026/june/ustr-makes-findings-and-proposes-action-60-section-301-investigations-relating-failures-take-action>, (last accessed June 3, 2026)

Table 5.1: EU's RASFF Notifications for Indian Rice Consignment from 2021-2025

S. No	Residue	No. of Notifications raised with Residue Occurrence (2021-2025)	Type of Risk Notified*	Stage at which this Risk Arises
Banned Chemicals in EU				
1	Carbendazim (a fungicide used to control fungal diseases in crops.)	1	Potentially serious; led to border rejection of the consignment	Cultivation stage (pesticide application)
2	Tricyclazole (a fungicide used primarily to control rice blast disease in rice cultivation.)	40	Serious; led to border rejections, with some alert notifications.	Cultivation stage (fungicide application during rice production).
3	Thiamethoxam (a neonicotinoid insecticide used to control insect pests in crops.)	29	Serious; led to border rejections, with some alert notifications.	Cultivation stage (insecticide application during crop production).
Non-Banned Chemicals (but under residue limitation)				
4	Aflatoxin B1 (a toxic fungal contaminant (mycotoxin) that develops in grains under warm and humid conditions)	12	Serious; led to border rejections, with some alert notifications.	Primarily during post-harvest storage, drying, handling and transportation when moisture levels are not adequately controlled.
5	Ochratoxin A (a toxic mycotoxin produced by fungi that can contaminate grains under poor storage conditions.)	23	Serious; led to border rejections, with some alert notifications.	Post-harvest storage, drying and handling
6	Imidacloprid (A neonicotinoid insecticide used to control insect pests in crops.)	5	Potentially serious; led to border rejection of the consignment	Cultivation stage (insecticide application during crop production).

Source: [RASFF Window - Search](#), (last accessed on June 2, 2026)

***Note:** Border Rejection means the following – reject entry into the EU, detain shipment, order re-dispatch to the exporting country, order destruction or place the consignment under customs control

5.1 Environmental Risks

Environmental risks in India's rice sector are closely linked to farm-level input

management, cultivation practices, soil and water quality, waste disposal mechanisms and post-harvest handling. Other environment challenges include extraction,

chemical inputs, water overuse/ground water depletion and energy subsidies promoting inefficient energy use (Kumar et al. (2021) & (Chatterjee et al., 2024)

1. Presence of Residues from Restricted Pesticides:

As seen in Table 5.1, the use of pesticides that are banned or subject to stringent EU residue limits poses a high risk and is classified as a “serious” issue in rice consignments from India. The European Food Safety Authority (EFSA, 2018) scientific assessments, which identify substances such as neonicotinoid pesticides (e.g., imidacloprid and thiamethoxam) as high-risk, suggest that these compounds lead to human health risks, forming the basis for strict EU regulatory controls. The consignments identified under the serious risk category were mainly subject to border rejection, which means the shipments were either re-dispatched to the country of origin, destroyed, or refused entry into the EU market.

2. Inadequate Storage, Drying and Post-Harvest Handling Leading to Aflatoxin B1 and Ochratoxin A Contamination:

Poor storage and handling practices can increase the risk of fungal contamination and the development of mycotoxins and is considered a high food safety risk in our exports to the EU. Between 2021 and 2025, there were many cases of aflatoxin B1 and ochratoxin A contamination in

Indian rice consignments (see Table 5.1), which may have arisen from storage under humid conditions, poor packaging or drying, and inadequate moisture management. Based on EFSA's 2020 risk assessment,¹⁹ the EU maintains strict limits for aflatoxin B1 because it is a genotoxic carcinogen capable of causing liver cancer in humans and exposure levels indicate a potential health concern. The contamination can arise due to poor storage in *mandis* and warehouses.

3. Green House Gas Emission: Rice cultivation contributes significantly to greenhouse gas emissions. According to the Intergovernmental Panel on Climate Change (IPCC Guidelines, 1996) and Indian Council of Agricultural Research (ICAR, 2025) studies, flooded paddy fields create anaerobic conditions that generate methane emissions, making rice cultivation one of the major agricultural sources of methane gas emissions.²⁰ In addition, crop residue burning remains prevalent in parts of the basmati growing belts of the Indian states of Punjab and Haryana after the paddy harvest, which leads to greenhouse gas emission, loss of soil nutrients and air pollution (ICAR, 2018).

4. Depletion of Ground Water: NITI Aayog's Composite Water Management Index (2019)²¹ and the annual report of

¹⁹ See EFSA (2020), [Risk assessment of aflatoxins in food - - 2020 - EFSA Journal - Wiley Online Library](https://www.efsa.europa.eu/en/risks/assessment/aflatoxins) (last accessed on June 2, 2026), ICAR, 2025 Study, <https://epubs.icar.org.in/index.php/OIJR/article/view/172215> (last accessed on June 2, 2026)

²⁰ Intergovernmental Panel on Climate Change (IPCC), 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other Land Use (AFOLU) (Hayama, Japan: Institute for Global Environmental Strategies, 2006), accessed on May 30, 2026, <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>., Singh, A. K., Sharma, R. C., & Singh, S. K. (2014). Effect of integrated nutrient management on yield and nutrient uptake in rice. *Agricultural Reviews*, 35(2), 93–98. Accessed on May 31, 2026, from <https://epubs.icar.org.in/index.php/AAR/article/view/37514>

²¹ NITI Aayog, *Composite Water Management Index 2.0: A Tool for Water Management* (New Delhi: Government of India, 2019), accessed on May 30, 2026, <https://www.niti.gov.in/sites/default/files/2023-03/CompositeWaterManagementIndex.pdf>

the Central Ground Water Board (2025) have identified Punjab and Haryana as being among the most water-stressed agricultural regions, with groundwater levels declining due to intensive paddy cultivation. The widespread use of tube wells, coupled with the water-intensive nature of rice production, has contributed to unsustainable water use patterns. Studies have shown that free or highly subsidised electricity for agriculture is linked to excessive groundwater extraction in north-western India (Badiani et al., 2019; Kumar et al., 2022).

- 5. Heavy Dependence on Chemical Fertilisers:** The large-scale use of chemical fertilisers leads to poor soil health. According to the Ministry of Chemicals and Fertilisers (2024-25), India's fertiliser consumption remains heavily skewed towards nitrogen use, with the national N:P: K ratio estimated at 9.3: 3.5: 1, significantly above the commonly referenced balanced ratio of 4:2:1.²² Assessments under the Soil Health Card Scheme (2025-26) have reported that in rice-growing states such as Punjab and Haryana, nearly 60 per cent of soil samples were deficient in organic carbon, reflecting the long-term impact of intensive cultivation and imbalanced nutrient use. Excessive fertiliser use in paddy fields leads to nitrogen and phosphorus losses through surface runoff under flooded and rainfall conditions, making rice cultivation a significant source of water pollution. It promotes eutrophication and degrades

surface water quality (Wang & Huang, 2021).

- 6. Monocropping and Loss of Biodiversity:** Monocropping of rice has been shown to degrade the paddy ecosystem by causing soil nutrient depletion, reduced soil fertility, and increased pest infestation due to continuous cultivation of the same crop on the same land (Pingali et al., 2012; FAO, 2019). This is also considered as a high risk under EUCS3D, which focuses on bio-diversity.

Based on existing literature and stakeholder consultations, these have been identified as the top six environmental risks that need immediate policy attention.

5.2 Labour Risks

Rice cultivation in India is highly labour-intensive and depends largely on manual work. Labour-related risks in the sector include reliance on seasonal migrant labour, occupational health hazards associated with exposure to chemical pesticides and concerns related to child labour across different stages of the supply chain (Chaithanya et al., 2024; Kumar et al., 2024). These risks are further compounded by the informal and fragmented nature of agricultural employment, which limits effective monitoring and enforcement of labour standards. There are four key labour-related risks.

- 1. Lack of Proper Labour Audits by MSME Processors/Farmers:** MSME producers typically source agricultural commodities through mandis and intermediary trader

²² Press Information Bureau, Government of India, accessed on May 30, 2026, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2244397®=3&lang=2>

networks, where produce from several smallholder farms is aggregated before reaching processors. Consequently, MSMEs often have limited visibility regarding the specific farms from which raw materials originate and the labour and production practices employed at the farm level. Indian agriculture is predominantly characterised by smallholder and family-operated farms, with household members contributing significantly to agricultural activities, often as unpaid family labour (Aubron et al., 2022). The fragmented nature of agricultural value chains and the presence of multiple intermediaries can constrain traceability and monitoring of farm-level practices (Mishra et al., 2018). As a result, MSMEs may face challenges in verifying labour conditions and demonstrating compliance with emerging sustainability and due-diligence requirements.

- 2. Informal Employment and Weak Contracts:** Rice cultivation, particularly in the Punjab-Haryana belt, relies heavily on seasonal migrant labour from states such as Uttar Pradesh, Bihar and Jharkhand, mainly for transplanting and harvesting operations. These workers are commonly engaged through informal employment arrangements with limited written contracts and weak regulatory oversight, creating challenges for labour monitoring and compliance audits (Verma, Singh & Singh, 2010). Studies on migrant agricultural labour in Punjab further indicate that seasonal workers often face inadequate housing,

sanitation and access to healthcare during peak agricultural seasons, increasing their vulnerability to poor living and working conditions (Verma, Singh & Singh, 2010; Maan & Sharma, 2019).

- 3. Occupational and Health-related Risks:** Rice cultivation in India relies heavily on pesticides, yet personal protective equipment (PPE) use remains extremely low, especially among smallholders and hired labourers. A field study of 120 farmworkers in Rangareddy district, Telangana, found that 99 per cent did not use PPE during pesticide application, resulting in significantly higher dermal pesticide residues. The Food and Agriculture Organization (FAO, 2018)²³ and the World Health Organization (WHO) identify pesticide exposure as a major occupational hazard in agriculture in developing countries, including India, with risks compounded by weak training and poor enforcement of safety standards.
- 4. Child Labour and the Challenges of Monitoring it:** The use of child labour, especially family labour, in cultivation has been identified as a high labour related risk in case of rice cultivation in India. Children may be involved in field activities or post-harvest processing such as milling, while in some cases their presence alongside adult workers can lead to underreporting or misclassification in monitoring systems. This complicates enforcement in fragmented and informal supply chains. As mentioned above, the US Department

²³ <https://www.who.int/publications/i/item/9789241516884>, (last accessed on June 3, 2026)

of Labor (Bureau of International Labor Affairs)²⁴ import monitoring frameworks have identified rice from India as a commodity at risk of child and forced labour, particularly in agro-processing clusters in states such as Tamil Nadu, highlighting the need for stronger traceability, audit systems and corrective action.

The environmental and labour risks identified above are based on available evidence and existing literature. However, the larger challenge lies in addressing these risks within India's highly fragmented rice value chain. As compliance requirements increasingly extend beyond food safety to environmental sustainability, labour standards and supply-chain due diligence, a clear gap is emerging between large firms and small farmers, and SME businesses (millers). Large firms/exporters/Tier 1 partners of EU companies have begun adopting traceability systems, sustainability initiatives, certifications and supplier-monitoring mechanisms, but small farmers and millers/SME processors lack knowledge of EU regulatory requirements, or often do not have the resources, technology, information and capacity to comply with these requirements. Smaller farmers and SME processors are at risk of exclusion from the EU market if EUCS3D is implemented unless there is targeted support for this group. At the institutional level, the risks show that the Indian export control system fails to maintain food safety standards. These agencies may not have the mandate to address labour related requirements and

other requirements of environmental sustainability as laid down by EUCS3D. Overall, meeting the EUCS3D requires co-ordinated effort across various government agencies at the central and state level, and multistakeholder partnerships. The India-EU FTA provides a framework for the two parties to discuss and resolve some of the issues as discussed below.

5.3 India-EU FTA: Implications for the Rice Sector

The India-EU Free Trade Agreement does not extend tariff liberalisation to rice. However, the Agreement contains several chapters/provisions that are directly relevant to the regulatory barriers documented in Sections 3, 4 and 5 of this paper that, if utilised strategically, can reduce the compliance burden on Indian rice exporters.²⁵

- **SPS Chapter (Chapter 5) and the Compliance Ecosystem**

Article 5.12 of the SPS chapter provides for co-operation and information exchange on import controls, inspection systems, certification procedures and audits. India may use this provision to seek EU equivalence recognition for its existing systems, specifically APEDA's portal "Basmati.Net" traceability platform and the National Programme for Organic Production (NPOP) or organic rice. Such recognition would eliminate duplicate testing and re-certification requirements for Indian exporters, directly reducing compliance costs. The SPS Committee established under

²⁴ [List of Goods Produced by Child Labor or Forced Labor | U.S. Department of Labor](#) (last accessed on June 3, 2026)

²⁵ [India-EU text-agreements](#), (last accessed on June 8, 2026)

the FTA provides the standing forum for India to raise MRL-related challenges documented in Table 5.1 and to seek bilateral co-operation on pesticide transition timelines (e.g., one-crop year) and testing method harmonisation.

- **Customs & Trade Facilitation and Digital Trade (Chapter 4 & Chapter 9): Traceability and Pre-shipment Verification for SPS Compliance**

Strengthening end-to-end digital traceability will be increasingly important for food safety and sustainability requirements in the EU market. The SPS chapter encourages electronic certification, transparency and technical consultations, while the Customs and Trade facilitation and Digital Trade chapters promote electronic submission of trade documents, inter-agency co-operation, and paperless trading. Together, these provisions can support pre-shipment verification of compliance information and stronger farm-to-market traceability.

- **Sustainable Food Systems (Chapter 15) and the Deceptive Practices Risk**

Under Articles 15.4 and 15.5 of the Sustainable Food Systems chapter, both parties have committed to co-operation on transitioning towards sustainable food systems and to addressing deceptive practices in agri-food supply chains. The latter provision carries a direct legal risk for India. India's rice consignments have repeatedly triggered RASFF notifications for EU-banned pesticide residues and mycotoxin contamination from poor post-harvest management. When a consignment is certified as compliant before export but

found in violation at the EU border, it provides a credible basis for invoking the deceptive practices provision. This exposes India to enhanced surveillance, loss of FTA co-operative benefits, and broader restrictions on market access – risks that go well beyond individual consignment rejections.

- **Trade and Sustainable Development (Chapter 16)**

The Trade and Sustainable Development chapter provides a framework for dialogue and co-operation on environmental protection, climate change, labour rights and responsible business conduct. This is directly relevant to the environmental and labour risks identified in Sections 5.1 and 5.2. The Committee on Trade and Sustainable Development, established under the FTA, provides a standing forum through which India can engage with the EU on capacity building support for smallholders and SME processors, technical assistance for sustainable cultivation practices and jointly recognised audit frameworks aligned with CS3D requirements.

Together, these chapters establish the India-EU FTA as a strategic platform for addressing the regulatory, environmental and labour-related barriers facing India's rice exports that go well beyond its limited tariff scope. However, the Agreement's co-operative provisions can only deliver tangible benefits if India addresses its domestic compliance gaps in parallel. The recommendations in the following section outline the priority actions required.

5.4 Recommendations to Mitigate Rice Sector-related Risks

The above discussion shows that while initiatives are being taken by companies and certain organisations to address the environmental and labour risks, the risk persists. This section outlines recommendations to mitigate food safety, environmental and labour-related risks in India's rice sector. The proposed measures can support compliance with emerging sustainability and due diligence requirements, particularly under the EUCS3D, while also helping address growing regulatory concerns in other key export markets such as the USA. Collectively, these actions can strengthen the competitiveness, sustainability and resilience of India's rice sector in the global market.

1. Traceability to the Farm Level: There is an urgent need to establish traceability to all farms from which export originates. In this context, APEDA has rolled out basmati.net but this should be strengthened to ensure strict adherence to EU requirements. Traceability should not only include food safety but also labour and environmental audits to reduce export concerns linked, for instance to soil health, or agricultural labour and their working conditions.

International experience suggests that digital traceability systems are increasingly becoming a competitiveness tool rather than merely a compliance requirement. Countries such as South Korea are already working towards aligning their cross-border paperless trade initiatives and the EUCS3D, so that

when the EU implements the regulations, exports do not face any barriers and/or the barriers are reduced.

2. Indian Companies have to Focus on Environmental and Social Audits: Rice exporters and processors should undertake regular environmental and social audits covering pesticide use, water management, labour conditions, occupational safety and child labour risks across their supply chains. The central and state governments should support the development of sector-specific due diligence frameworks and capacity building programmes, particularly for MSMEs. Existing practices adopted by companies such as LT Foods Ltd. and KRBL Ltd. demonstrate the feasibility of integrating sustainability reporting, supplier monitoring and labour compliance systems into business operations. These practices should be scaled-up through awareness building and training programmes.

3. Exporters and Export Control Agencies Should Strictly Follow EU's Quality Standard: Export control agencies should strengthen monitoring, inspection and certification systems to ensure compliance with EU food safety requirements. A designated nodal agency should be established on the Indian side as the single point of contact for co-ordinating farm level traceability data such as geotagging, laboratory test results, audit reports and certification records to facilitate electronic exchange with EU regulators through a shared digital platform as both India and the EU move towards cross-border paperless

trade. Any concerns related to exports then can be raised with data and evidence using the platform agreed upon in the FTA. The central and state governments should strengthen regulation and monitoring of pesticides that are banned or highly restricted in key export markets and promote good agricultural practices (GAP), sustainable rice platform (SRP) standards and the judicious use of agricultural inputs. Exporters and millers should complement these efforts through farmer training, supplier monitoring and residue-testing programmes.

4. **Improve Post-Harvest Practices to Reduce Aflatoxin B1 and Ochratoxin A Contamination:** The government should prioritise upgrading APMC infrastructure with modern warehousing systems and temperature and moisture control mechanisms to reduce post-harvest spoilage and fungal growth. This should be supported by technology-based digital recording and traceability systems to ensure end-to-end tracking of produce from farm to export, enabling quick identification of contamination sources in the case of Aflatoxin B1 or Ochratoxin A detections. At the industry level, exporters and processors should strengthen post-harvest management practices by adopting improved drying methods, hygienic storage conditions, moisture control systems and routine mycotoxin testing throughout storage and logistics.
5. **Reduce Greenhouse Gas Emissions through Clear Strategies and Measurable Targets:** The central and

state governments should develop targeted strategies to reduce greenhouse gas emissions from rice cultivation, with measurable targets for methane reduction and elimination of crop residue burning. States should also strengthen programmes for in-situ crop residue management and provide greater access to residue-management machinery to discourage stubble burning. Industry stakeholders should support adoption of these practices through farmer training and sustainable sourcing initiatives.

6. **Promote Water-Efficient Rice Cultivation and Sustainable Groundwater Management:** State governments in Punjab, Haryana, and western Uttar Pradesh should prioritise the adoption of water-efficient cultivation practices such as alternate wetting and drying (AWD), system of rice intensification (SRI), and direct-seeded rice (DSR), supported by subsidies and demonstration projects for small and marginal farmers. These states should also review and rationalise electricity subsidies for agriculture to discourage excessive groundwater extraction through tube wells and strengthen the regulation of groundwater use. Water governance should be improved by establishing state-level water data centres with real-time data to support better irrigation planning and groundwater management. At the industry level, companies sourcing from the basmati belt [as demonstrated by Tilda (Ebro Foods) through its Responsible Growing Programme in Haryana, Punjab, and Uttar Pradesh],

should scale up support for water-efficient farming among smallholder suppliers.

7. Focus on Improving Soil Health and Reducing Nitrogen-Based Fertiliser Use:

There should be strong focus on improving soil health through regular soil testing (NPK balance), supported by co-ordinated efforts of the central and state governments. The government should strengthen soil health card programme, enhance soil testing infrastructure and promote balanced fertiliser use through the adoption of organic and bio-fertilisers. Excessive use of nitrogen-based fertilisers should be reduced due to its adverse impacts such as soil degradation, water pollution and greenhouse gas emissions. At the industry level, agribusinesses should support farmers through soil monitoring programmes, training on sustainable

input use and adoption of precision agriculture techniques. LT Foods Limited already demonstrates such practices through sustainable farming initiatives, nutrient management programmes and farmer training aimed at improving soil fertility and reducing chemical input dependency.

8. Farm-Firm Linkage: The best way to increase exports to the EU by meeting various existing and upcoming compliance requirements is to produce exclusively for the EU market. This can be best achieved by linkage and agreements between exporting firms and producers. States should facilitate such arrangements by enabling legal provisions like contract farming. FPOs interested in receiving premium price should also be encouraged to tap this opportunity.

Box 5.1: Prime Minister Narendra Modi on Soil Health and Fertiliser Self-Reliance

Prime Minister Narendra Modi has consistently emphasised both the environmental costs of excessive fertiliser use and the need for domestic self-reliance in fertiliser production. Addressing the nation from the Red Fort on the 73rd Independence Day on 15 August 2019, he cautioned against indiscriminate chemical use:

"Have we ever thought about the health of mother earth? The way we are using chemical fertilisers and pesticides, we are destroying the earth. Can we reduce the use of chemical fertilisers by 10 to 25 per cent in our farmlands?"

In 2023, addressing the Indian Co-operative Congress, the Prime Minister stated that "*chemical-free farming, natural farming is the priority of the government*" and highlighted the PM-PRANAM scheme to incentivise states to shift farmers toward alternative and organic fertilisers.

Sources: Prime Minister's Independence Day Addresses, 15 August 2019 and 17th Indian Co-operative Congress, 2023

9. Promote Biodiversity: The central and state governments should promote

biodiversity in rice cultivation by encouraging crop diversification away

from monocropping systems and integrating biodiversity considerations into agricultural policies and subsidy frameworks. Integrated rice-fish farming (IRFF), already piloted in West Godavari, Andhra Pradesh, enhances nutrient cycling, reduces chemical input dependence, can increase rice yields and generates additional farmer income.²⁶ State agricultural departments should scale up such models through demonstration projects, farmer training and targeted financial support for small farmers. Incentives for organic and sustainable farming practices, supported by strengthened extension services, should complement these efforts.

The EU's Common Agricultural Policy (CAP) 2023-27 recognises rice paddies as functional wetland ecosystems and provides biodiversity-linked payments to farmers under its eco-scheme framework. India should draw on this experience to design biodiversity incentives within its own agricultural subsidy architecture.

10. Support Farmers and SMEs in Getting Carbon Credits: It is extremely important to develop a package of practices for farmers to get carbon credits as well as a standardised environmental, social and governance (ESG) framework for SMEs.

11. Implement the Four Occupational Codes: Four labour codes have been enacted by the central government but their implementation depends on state governments, as labour is a concurrent

subject. State governments should ensure time-bound implementation by strengthening state-level enforcement mechanisms, inspection system and worker grievance redressal frameworks to improve occupational safety, wages and social security compliance across the agricultural and agro-processing sectors. States should also build institutional capacity for effective monitoring and standardisation of labour practices. At the industry level, companies should conduct regular independent labour audits covering wage compliance, occupational health and safety, working conditions and contractual labour practices.

12. Strictly Enforce “No Child Labour” and “No Forced Labour” Across the Rice Value Chain: State governments should enforce a zero-tolerance policy on child labour through stronger inspections, surprise audits and effective implementation of labour laws across agricultural and export supply chains, with swift penalties for violations. Monitoring mechanisms should be strengthened at the farm and procurement levels, particularly in informal rural labour markets. At the industry level, exporters and agribusinesses should implement strict supplier codes of conduct, regular third-party audits and traceability systems to ensure that no child labour is used at any stage of production or procurement.

Compliance with food safety, environmental and labour standards is no longer a market-

²⁶ [The potential of Integrated Rice Fish Farming System to boost agroecological transitions in India's West Godavari | CGIAR System](#), (last accessed on June 8, 2026)

specific requirement but a universal condition for accessing premium global markets. Overall, the EU is moving from voluntary sustainability standards to legally binding regulations with clear mechanisms for enforcement and penalties, which has significant implications for exporters. Therefore, exporters must prepare for future policies such as the EUCS3D, which is likely to be applied uniformly across exports to the EU. India's rice sector faces risks across all three dimensions; managing these requires co-ordinated action across central and state governments, export control agencies and industry. Domestic compliance gaps in farm-level traceability, pesticide management, post-harvest handling and

labour monitoring must be addressed as a precondition for sustained market access. Establishing a single nodal agency is the most critical institutional reform required to deliver accountable and cost-effective export compliance. The India-EU FTA provides a strategic platform to reduce compliance costs through mutual recognition of audit and certification systems, and bilateral co-operation on sustainability and due diligence under EUCS3D. Strengthening India's compliance ecosystem domestically while leveraging the FTA's co-operative provisions will determine its long-term competitiveness in the EU and other regulated markets.

References

- Amira Nature Foods Ltd. (2019, March 15). *Form 20-F/A annual report for the fiscal year ended March 31, 2018*. [U.S. Securities and Exchange Commission \(SEC\). <https://www.sec.gov/Archives/edgar/data/1552448/000114420419013616/tv51602320fa.htm>](https://www.sec.gov/Archives/edgar/data/1552448/000114420419013616/tv51602320fa.htm) (last accessed on May 7, 2026)
- Aubron, C., Bainville, S., Philippon, O., & Dorin, B. (2022). Neither corporate, nor family: The Indian “patronal” farm. *Frontiers in Sustainable Food Systems*, 6, 850545. <https://doi.org/10.3389/fsufs.2022.850545> (last accessed on June 3, 2026).
- Badiani-Magnusson, R., & Jessoe, K. (2019). Electricity prices, groundwater, and agriculture: The environmental and agricultural impacts of electricity subsidies in India. In W. Schlenker (Ed.), *Agricultural productivity and producer behavior*. University of Chicago Press. <https://www.nber.org/books-and-chapters/agricultural-productivity-and-producer-behavior/electricity-prices-groundwater-and-agriculture-environmental-and-agricultural-impacts-electricity> (last accessed on June 2, 2026).
- Bhardwaj, M., & Dutta, T. (2025). Analysis of determinants of groundwater depletion in rice-wheat ecosystems of Punjab: A case of India. *Environment, Development and Sustainability*, 27(12), 29969–29987. <https://doi.org/10.1007/s10668-024-04902-0> (last accessed on May 29, 2026).
- Chaithanya, L. K., Joshi, P. P., Barua, S., Sangeetha, V., & Satyapriya. (2024). Occupational health hazards in paddy cultivation practices in the coastal region of Andhra Pradesh. *Journal of Scientific Research and Reports*, 30(7), 456–463. <https://doi.org/10.9734/jsrr/2024/> , (last accessed on July 3, 2026)
- Chatterjee, S., Lamba, R., & Zaveri, E. D. (2024). The role of farm subsidies in changing India's water footprint. *Nature Communications*, 15(1), 8654. <https://doi.org/10.1038/s41467-024-52858-6> , (last accessed on June 2, 2026).
- Foundation for Agrarian Studies (FAS) & International Rice Research Institute (IRRI) (2024). *Trends in costs and incomes from crop production in India*. FAS-IRRI collaborative report. https://fas.org.in/wp-content/uploads/2024/02/Work-Package_2-new_FAS-IRRI-CCPC_Report.pdf (last accessed on June 3, 2026).
- KRBL Limited. (2024). Annual report 2023–24. <https://krblrice.com/wp-content/uploads/2024/08/KRBL-Annual-Report-2024.pdf> (last accessed on May 7, 2026)
- Kumar, N., Nie, V., Palaniappan, K., & Bohatko-Naismith, J. (2025). Insecticide exposure and associated acute health effects in farmers in a rice growing district of India. *International Journal of Environmental Health Research*, 35(5), 1143–1155. <https://www.tandfonline.com/doi/full/10.1080/09603123.2024.2382305>
- Kumar, M. S., Palanichamy, N. V., Shivakumar, K. M., Chandrakumar, M., Kalpana, M., & Murugananthi, D. (2025).

Impact of climate change on global economy: A comprehensive review. *Regional Sustainability*, 6(6), 100274. <https://doi.org/10.1016/j.regsus.2025.100274> (last accessed on June 2, 2026).

LT Foods Limited (2025). *Annual report 2024–25: Built on resilience, driven by global vision*. https://ltf.ltfoods.com/docs/LT_Foods_%20AR_2024_25.pdf (last accessed on May 7, 2026)

Maan, A. S., & Sharma, V. K. (2019). Employment and income pattern of migrant agricultural labour in South Western Punjab. *Indian Journal of Economics and Development*, 15(1), 105–110. <https://doi.org/10.5958/2322-0430.2019.00012>. (last accessed on June 3, 2026)

Mishra, P. K., & Dey, K. (2018). Governance of agricultural value chains: Coordination, control and safeguarding. *Journal of Rural Studies*, 64, 135–147. <https://doi.org/10.1016/j.jrurstud.2018.09.020> (last accessed on June 3, 2026).

Mukherjee, A., Goyal, T. M., Miglani, S., & Kapoor, A. (2019). *SPS barriers to India's agriculture export: Learning from the EU experiences in SPS and food safety standards*. Indian Council for Research on

International Economic Relations (ICRIER). https://icrier.org/pdf/SPS_Barriers_to_India_Agriculture_Export.pdf (last accessed on May 10, 2026).

Pingali, P. L. (2012). Green revolution: Impacts, limits, and the path ahead. *Proceedings of the National Academy of Sciences of the United States of America*, 109(31), 12302–12308. <https://doi.org/10.1073/pnas.0912953109> (last accessed on June 2, 2026).

Tilda (2025). *Tilda impact report 2025*. Tilda. <https://tilda.com/wp-content/uploads/2026/05/2025-Tilda-ImpactReport.pdf> (last accessed on May 30, 2026).

Verma, A., Singh, G., & Singh, B. (2010). An analysis of socio-cultural and economic changes in migrant agricultural labourers in Punjab. *Social Change*, 40(3), 275–301. <https://doi.org/10.1177/004908571004000303> (last accessed on June 3, 2026)

Wang, L., & Huang, D. (2021). Nitrogen and phosphorus losses by surface runoff and soil microbial communities in a paddy field with different irrigation and fertilization managements. *PLOS ONE*, 16(7), e0254227. <https://doi.org/10.1371/journal.pone.0254227>, (last accessed on June 2, 2026)

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