Research Article

doi:10.25081/jpc.2025.v53.i3.10047
Journal of Plantation Crops, 2025, 53(3):35-44

Resilience and sustainability in the Indian coffee value chain: A Mixed-Method analysis

K. Venkateswaran[1], S. Jayasekhar[2,*], S. Usha[1] and Dharini Chittaragi[1]

[1] *Indian Institute of Plantation Management (IIPMB) Bengaluru - 560 056, Karnataka, India*
[2] *ICAR-Central Plantation Crops Research Institute, (ICAR-CPCRI), Kasaragod, Kerala- 671124, India*

(Manuscript Received: 03-03-2026, Revised: 02-07-2026, Accepted: 10-07-2026)

Abstract

The Indian coffee industry holds a significant position in the global coffee trade, supporting rural livelihoods, generating export revenue, and maintaining plantations rich in biodiversity. However, the sector faces increasing challenges due to climate variability, market volatility, sustainability compliance requirements, and uneven value distribution within the value chain. This study employed a mixed-method research approach, integrating quantitative and qualitative analyses to examine resilience, sustainability, and competitiveness in the Indian coffee industry. Trend analysis, descriptive statistics, comparative analysis, and compound annual growth rate (CAGR) were applied to secondary data from the Food and Agriculture Organisation, the World Bank, and the Coffee Board of India for 2013–2024. The qualitative component is based on documentary review and thematic analysis of value chain governance, certification programmes, climate adaptation strategies, and sustainability practices. The findings indicate improved economic outcomes associated with sustainable farming and certification practices, a moderate increase in coffee production, and a growing prevalence of climate-resilient Robusta cultivation. Nevertheless, institutional gaps, limited technical knowledge, and high compliance costs continue to restrict smallholder participation. The study underscores the importance of market diversification, digitalization, and sustainability in enhancing resilience and export competitiveness within the Indian coffee value chain.

Keywords*:* Global Value Chain, Coffee Industry, Climate resilience, Certification, Sustainability

Introduction

Coffee is one of the world's most widely traded agricultural commodities and is extensively integrated in international markets. The economic significance of coffee extends beyond trade value and is supporting rural livelihoods in developing economies across Latin America, Africa, and Asia (Bozzola *et al*. 2021; Nadaf *et al*. 2024). India ranks as the fifth largest coffee exporter globally, while Brazil remains the leading exporter. South American countries dominate global coffee exports, whereas the United States is the largest importer (Radimersky and Ulbrichtova, 2016). Although India's contribution to global output is relatively modest, its unique shade-grown cultivation system and biodiversity-rich production landscapes position it strategically within specialty and sustainable coffee markets (Pyk, 2018). International market experts highly regard Indian coffee for its diverse and complex flavour profiles, which offer a distinctive sensory experience through aroma, texture, and overall quality.

The coffee sector contributes substantially to the economic development of its cultivating regions, impacting both local economies and ecological systems. Kodigehalli and Wolfgang (2011) along with Gana shruthy, Kumar and Yadav (2016), indicate that coffee cultivation is a resource-intensive process, necessitating considerable investments across time, capital, and specialized knowledge. Babu *et al.* (2019) suggest that a stable and prosperous future for the coffee sector can be fostered through a combination of strategies, such as expanding export markets, implementing

**Corresponding Author: jaycpcri@gmail.com*

sustainable farming practices, and allocating resources to technological advancements. Fostering diversification among smallholder farmers is posited to enhance their long-term viability and competitiveness within international markets.

Technological innovation is transforming the Indian coffee industry by enhancing productivity, sustainability, and market competitiveness. Digital traceability solutions such as blockchain and QR code-based tracking provide supply chain transparency, ensuring authenticity and compliance. Precision farming methods, including IoT-enabled sensor-based satellite imaging and AI-powered data analytics, help maximize resource use (Kundu and Chopra, 2009). By monitoring soil, climate, and crop health, farmers can make data-driven decisions to improve yield quality and reduce input costs (Pham, Chuah and Feeny, 2022). Integrating digital tools in coffee farming increases productivity, resilience, and sustainability, strengthening India's position in the international market (Chopra and Kundu, 2008). Businesses that promote direct trade foster long-term partnerships and support sustainable livelihoods (Ponte, 2004). Strengthening regulations and increasing consumer awareness of fair-trade practices can help create a more equitable coffee industry in India.

Although the literature on sustainable coffee systems is expanding, comprehensive analyses of resilience, sustainability, certification, and value chain competitiveness in the Indian coffee sector using a mixed-methods framework remain limited. This study addresses this gap by integrating production trends, sustainability outcomes, and institutional dynamics within the Indian coffee value chain.

Methodology

This study uses both quantitative and qualitative methods to give a full picture of the coffee value chain. For the qualitative part, it draws on documentary reviews and insights from earlier research, policy reports, and case studies. The research focuses on Tamil Nadu, Kerala, and Karnataka, the main coffee-producing states in India. These states were chosen because of their economic importance, suitable climate, and strong links to both domestic and international coffee markets. Studying these regions helps us understand the wider trends and dynamics in India's coffee value chain.

The quantitative analysis relied on secondary data. These data were compiled from established sources, specifically the Food and Agriculture Organisation (FAO), the World Bank, the Coffee Board of India, and a review of published literature. Spanning the period from 2013 to 2024, the dataset incorporated several key variables: coffee production, export volumes, prevailing price trends, and various income indicators. This comprehensive scope allowed for an assessment of long-term trajectories in coffee production and exports, alongside the identification of salient challenges confronting the sector. To analyze the gathered information, comparative analysis and descriptive statistics were utilized. These methods served to investigate fluctuations in price, examine the distribution of income, and assess the distinctions between conventional and sustainable cultivation practices. The Compound Annual Growth Rate (CAGR) method was employed, and CAGR was calculated to measure long-term growth patterns in production and exports.

While quantitative data provides measurable trends and relationships, qualitative insights explain the structural and institutional dynamics influencing the coffee value chain. Primary data were collected from 120 coffee growers in Madikeri and Chikkamagaluru districts through a structured questionnaire. Farmers were classified as certified and non-certified. Information on annual farm income (₹/ha), farm size (ha), soil health, education access, and certification status was obtained. Soil health was evaluated using a composite index based on key soil quality indicators and standardized to a 0–100 scale, while education access was measured using an index incorporating educational infrastructure and participation in extension services. Descriptive statistics were used to summarize the data. Statistical analyses were conducted at a 5 per cent significance level. These findings clarify the factors behind the quantitative trends observed. This mixed-method approach

ensures a holistic evaluation of resilience, sustainability, and competitiveness in the Indian coffee sector.

Results and Discussion

Production trends in the Indian coffee sector

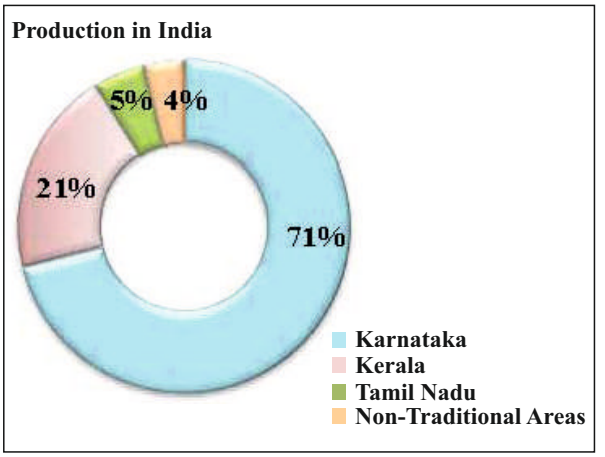
India's coffee production grew moderately during 2013-24, rising from 318,200 MT in 2013 to 374,200 MT in 2024. The production structure remained largely dominated by Robusta Coffee, which consistently accounted for nearly 70 per cent of total production, while Arabica production showed comparatively lower, fluctuating output levels (Table 1). The fluctuations observed during certain years, particularly 2017-20, were primarily associated with erratic rainfall, pest incidence, and changing climatic conditions in major coffee-growing areas. The increasing dominance of Robusta cultivation reflects a gradual structural shift towards climate-resilient coffee varieties within the Indian coffee sector. Compared to Arabica, Robusta demonstrates greater tolerance to temperature variability, excessive rainfall, and pest attacks, making it more suitable for changing agro-climatic conditions. The concentration of coffee production in Karnataka, followed by Kerala and Tamil Nadu (Fig. 1), further underscores the sector's dependence on ecologically sensitive regions of the Western Ghats.

Table. 1 Status of coffee production in India

Year	Arabica (MT)	Share (%)	Robusta (MT)	Share (%)	Total (MT)
2013	98600	31	219600	69	318200
2014	102200	34	202300	66	304500
2015	98000	30	229000	70	327000
2016	103500	30	244500	70	348000
2017	95000	30	217000	70	312000
2018	95000	30	221000	70	316000
2019	95000	30	224500	70	319500
2020	87000	29	211000	71	298000
2021	99000	30	235000	70	334000
2022	95000	28	247000	72	342000
2023	100000	28	252000	72	352000
2024	113000	31	261200	70	374200

Source: Coffee Board of India

Fig 1. Status of coffee production in India (% share)



These trends suggest that, although the Indian coffee sector has maintained production stability, long-term sustainability is vulnerable to climate variability and production risks. The gradual adoption of resilient cultivation practices and sustainable farm management is therefore essential for maintaining productivity, export competitiveness, and livelihood security within the coffee value chain. Similar observations were made by Abhinav and Kuruvila (2021), who reported that climate instability has increasingly affected Arabica cultivation in southern India.

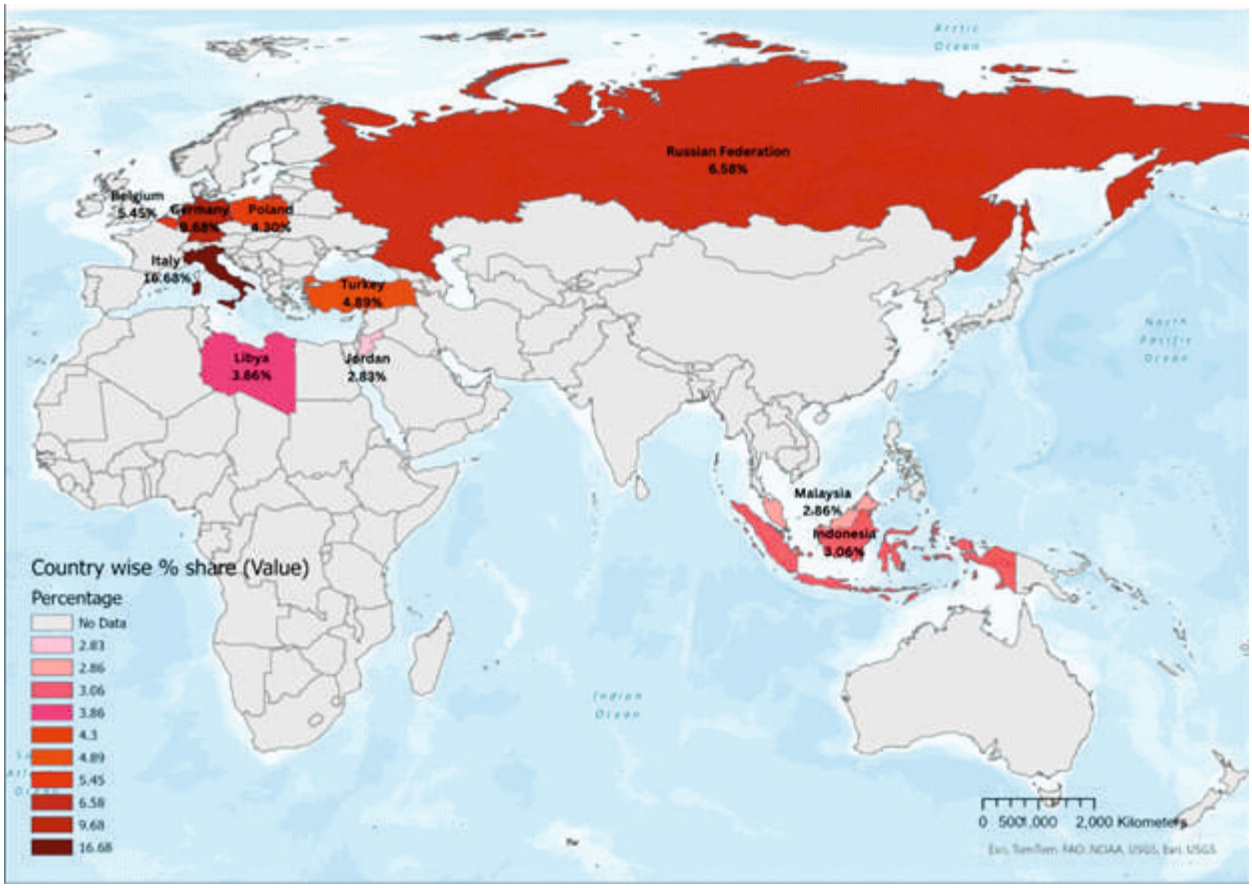
Export performance of the Indian coffee sector

India remains one of the world's major coffee exporters, with nearly 70-80% of domestic coffee production directed towards international markets. European countries continue to dominate as the primary export destinations for Indian coffee (Table 2). The primary export destinations for Indian coffee (Table. 2 & Fig. 2), based on market value, are Italy, Germany, Russia, Belgium, Jordan, and Libya. These countries collectively account for a substantial portion of India's coffee export revenue. Other notable importers of Indian coffee include Spain, Slovenia, the United States, Japan, Greece, the Netherlands and France. The diverse range of export destinations underscores the global appeal and acceptance of Indian coffee, reflecting its quality and the country's robust trade relationships.

Table. 2 Major export destinations of Indian coffee in the year 2024-25

S.No.	Countries	Quantity (MT)	Value (US $ Mn)	% share (Value)
1	Italy	63,999	202.29	16.68
2	Germany	42,792	126.61	9.68
3	Russian Federation	38,664	76.06	6.58
4	Belgium	27,096	68.34	5.45
5	Turkey	19,431	62.82	4.89
6	Poland	17,476	43.14	4.30
7	Libya	16,126	42.56	3.86
8	Indonesia	14,087	27.44	3.06
9	Malaysia	11,840	33.55	2.86
10	Jordan	10,983	45.38	2.83

Fig 2. Primary export destinations for Indian coffee, based on the market value



The strong dependence on external markets reflects the export-oriented nature of the Indian coffee value chain, but also increases the vulnerability to global market uncertainties. Emerging sustainability regulations, particularly the European Union Deforestation Regulation (EUDR), have increased compliance pressures on exporters and smallholder producers. At the same time, India's competitiveness in the global coffee trade remains constrained by limited value addition, market concentration, and a relatively lower comparative advantage compared with major coffee-exporting countries such as Brazil, Colombia, and Ethiopia. Studies by Chengappa *et al.* (2019) observed that certified and sustainability-oriented coffee value chains demonstrate stronger coordination and better market integration compared to conventional chains. Similarly,

Jagadeesh *et al.* (2024) noted that although Indian coffee has export potential, its revealed comparative advantage remains lower than that of leading global competitors. Enhancing export competitiveness in the Indian coffee sector requires greater diversification of export markets, increased value addition, stronger sustainable compliance and improved branding of specialty and GI-certified Indian coffees in the global markets.

The Compound Annual Growth Rate (CAGR) analysis indicates moderate, yet stable, growth in the Indian coffee sector during 2013–2024. Coffee production recorded a CAGR of 2.93 per cent (Table 3), reflecting gradual expansion in cultivation and increased dominance of climate-resilient Robusta varieties. Export quantity growth remained relatively stagnant at 0.28 per cent, suggesting limited expansion in export volumes despite India's strong dependence on international markets.

Table 3. CAGR of the Indian Coffee Sector (2013-2024)

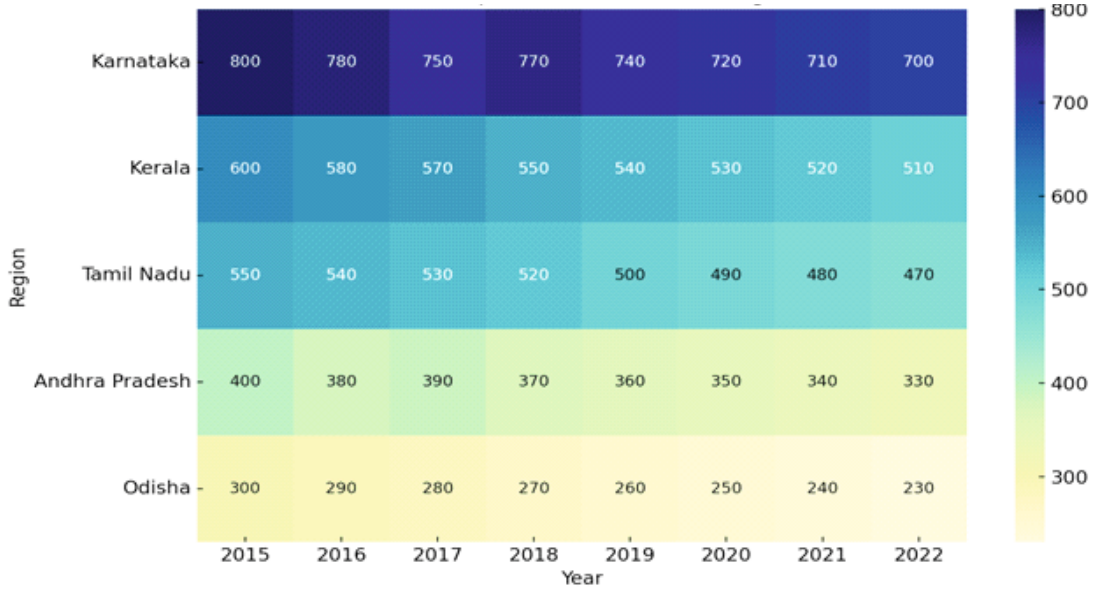
Indicator	CAGR (%)
Coffee Production	2.93
Coffee Export (Quantity)	0.28
Coffee Export (Value)	23.30
Domestic Consumption	1.25

In contrast, coffee export value registered a significantly higher CAGR of 23.30 per cent, indicating improved value realization driven by rising global coffee prices, increased demand for specialty coffee, and greater participation in value-added coffee exports. Domestic coffee consumption recorded a CAGR of 1.25 per cent, reflecting gradual growth in urban coffee culture and increasing domestic market penetration. The CAGR trends suggest that, while India's coffee sector has maintained production stability and improved export earnings, future competitiveness will depend on greater value addition, market diversification, compliance with sustainability standards, and climate-resilient production systems.

Climate vulnerability in the Indian coffee sector

Climate variability has emerged as a major challenge affecting the Indian Coffee sector, particularly in the coffee-growing regions of Karnataka and Kerala (Fig. 3). Irregular rainfall patterns, rising temperatures, prolonged dry spells and increased pest incidence have significantly affected coffee productivity and bean quality during recent years. Arabica coffee has been found to be more vulnerable to climatic stress, whereas Robusta has demonstrated relatively greater

Fig 3. Climate impact on coffee yields in various coffee-growing areas



resilience under changing environmental conditions. The findings indicate that climate-induced production risks not only reduce farm-level productivity and income stability, but also weaken export competitiveness due to supply fluctuations and quality deterioration. In response, farmers are increasingly adopting resilience-oriented practices such as shade-grown cultivation, water conservation, agroforestry systems and climate-resilient coffee varieties. These adaptive measures are becoming essential for ensuring long-term sustainability and resilience within the Indian coffee value chain.

Studies by Bunn *et al.* (2015) highlighted that coffee cultivation is highly sensitive to temperature and rainfall variability, and that climate change is expected to reduce the suitability of traditional coffee-growing regions over time. Similarly, Byrareddy *et al.* (2024), observed that rainfall variability and rising maximum temperatures significantly influence coffee yields in Indian agroforestry systems, particularly in the Kodagu, Chikkamagaluru, and Wayanad regions.

Sustainability practices in the Indian coffee sector

The adoption of sustainable practices within the Indian coffee sector has demonstrated significant environmental and economic benefits across the value chain. Sustainable cultivation measures such as shade-grown farming, organic manure application, rainwater harvesting, agroforestry systems and eco-certification have contributed to improved resource efficiency and ecological conservation. The findings of the study indicate (Table 4) that sustainable practices increased coffee yields from 750 kg/ha under conventional systems to 900 kg/ha, while reducing input costs by nearly 33 per cent. Similarly, net income levels were found to be considerably higher among farmers adopting sustainable practices due to improved productivity and better market realization.

Table 4. Impact of sustainable approaches on cost and environmental conservation of coffee

Indicator	Traditional practices	Sustainable measures	% Change
Yield (kg/ha)	750	900	20%
Cost of inputs (₹/ha)	30,000	20,000	-33%
Net income (₹/ha)	82,500	1,26,000	53%
Water use (m^3/ha)	5,000	2,600	−48.0%
Carbon footprint (kg CO_2e/ha)	3,200	2,080	−35.0%

These findings suggest that sustainability-oriented farming systems improve both ecological efficiency and economic viability in coffee cultivation. The improvement in farm-level performance can be attributed to reduced chemical dependency, enhanced soil fertility, efficient water management practices, and a reduced carbon footprint associated with shade-grown coffee cultivation. Sustainable systems also contribute to biodiversity conservation (Table 5) by preserving native tree cover and reducing environmental degradation in the coffee-growing regions of the Western Ghats. The results further indicate that sustainability practices strengthen long-term resilience within the Indian coffee value chain by improving productivity stability under climatic and market uncertainties. Farmers adopting eco-certification and sustainable cultivation methods were found to have relatively better access to premium markets and export-oriented supply

Table 5. Comparative analysis of the Western Ghats Region of Karnataka and Kerala

Factor	Karnataka (Western Ghats)	Kerala (Western Ghats)
Forest Cover and Tree Diversity	High tree diversity, native species like Silver Oak, Jackfruit, and Ficus	Rich in native tree species but often mixed with more commercial trees
Flora and Fauna	Home to endemic species like the Lion-tailed Macaque and Malabar Civet	Presence of species like the Nilgiri Langur and Malabar Hornbill
Agroforestry Practices	Preserving primary forest and mixed cropping (e.g., pepper, cardamom)	Some farms use mixed cropping (e.g., pepper, cardamom)
Impact on Pollinators	High bee and butterfly diversity, supporting natural pollination	Similar high pollinator presence, but more fragmented landscapes
Water Conservation	Efficient rainwater harvesting; natural stream preservation	Higher rainfall, but some water -intensive plantations
Threats to Biodiversity	Increasing shift to sun-grown coffee due to yield demands	Smaller landholdings leading to fragmented habitats

chains. However, the adoption of sustainability standards remains uneven among smallholders due to high certification costs, limited institutional support, and inadequate technical awareness.

These findings are consistent with earlier studies by Blackman and Rivera (2011), who highlighted the positive economic outcomes associated with sustainability certification and environmentally responsible farming systems. Similar observations were also reported by Anil Kumar, Saleem Khan, and Balakrishnan (2018) and Raman *et al.* (2021), who emphasized the ecological importance of shade-grown coffee systems in supporting biodiversity conservation and environmental sustainability in coffee-growing landscapes.

Certification in the Indian coffee sector

Certification-based cultivation systems demonstrated relatively higher economic outcomes among coffee growers due to improved market access, premium pricing opportunities and stronger integration into export-oriented supply chains. Farmers adopting certification standards such as the Organic, Fair Trade, and Rainforest Alliance conventions were found to realize better prices than conventional producers. The findings indicate that certified coffee farms recorded comparatively higher economic returns (Table 6) and greater market accessibility, owing to enhanced buyer confidence, compliance with traceability requirements, and access to sustainability-oriented international markets.

The improved performance of certified farms can be attributed to practices such as organic nutrient management, shade-grown cultivation, rainwater conservation, and adherence to sustainability standards. In addition, certification facilitates better market access, premium pricing opportunities, and stronger integration into export-oriented supply chains. These findings suggest that sustainability certification contributes positively to both ecological resilience and farmer income within the Indian coffee value chain. In addition, certified producers often benefit from improved institutional linkages, training support and greater participation in organized value chains.

Table 6. Comparative summary of certified and non-certified coffee farms

Category	Average income (₹/ha)	Average soil health score	Average water usage efficiency (%)	Average fertilizer usage reduction (%)
Certified Farms	11,64,267	81.75	78.40	32.50
Non-Certified Farms	9,42,322	71.10	61.25	14.80

However, despite the economic advantages associated with certification, adoption remains uneven among smallholder coffee growers. High certification and compliance costs, lack of technical awareness, limited access to institutional finance and complex documentation requirements continue to act as major barriers to participation. Small and marginal farmers often face difficulties in meeting traceability and sustainability standards required by international buyers, particularly under emerging regulatory frameworks such as the European Union Deforestation Regulation (EUDR).

The findings are consistent with the studies by Blackman and Rivera (2011), who highlighted that sustainability certifications can improve farmer livelihoods through premium prices and enhanced market integration. Similar observations were reported by Chengappa *et al.* (2019), who concurred that certified coffee value chains in India demonstrate better coordination, export competitiveness, and income realization compared to conventional marketing systems.

Strategic upgrading opportunities in the Indian coffee sector

The Indian coffee value chain can enhance its resilience and competitiveness through strategic upgrading, particularly via digitalization and market diversification. The adoption of digital technologies, such as e-commerce platforms, digital traceability systems, mobile-based advisory services, and precision farming tools, has improved access to market data, farm management techniques, and direct buyer connections. Furthermore, digital platforms have reduced farmers' dependence on traditional intermediaries by increasing price transparency.

The need for digital integration throughout the value chain is further underscored by the growing importance of sustainability compliance and traceability in the international coffee trade. Particularly in light of changing international laws, such as the European Union Deforestation Regulation (EUDR), technologies like blockchain-based traceability systems and digital certification platforms can enhance transparency, quality assurance, and export readiness. Additionally, specialty coffee branding and digital marketing give Indian coffee producers access to high-end niche markets and boost customer engagement in both local and foreign markets.

Market diversification is a critical strategy for reducing reliance on exports and enhancing long-term sectoral resilience. The persistent concentration of Indian coffee exports in European markets exposes the industry to fluctuations in external demand and regulatory changes. Expanding exports to developing markets in Asia, the Middle East, and North America, alongside promoting domestic coffee consumption, can mitigate risks associated with market concentration and improve income stability for producers and exporters.

Studies by Kaplinsky (2004), and Gereffi (2019) emphasized that value chain upgrading through innovation, technology adoption, and market diversification is essential for improving competitiveness in global agri-food trade. Similar observations were made by Chengappa *et al.* (2019), who highlighted the importance of institutional support, digital integration, and specialty market development for strengthening India's coffee export performance. Overall, the results indicate that the Indian coffee industry can greatly increase efficiency, traceability, export competitiveness and value realization through digital transformation and diversified market strategies. However, more robust digital infrastructure capacity-building programs, institutional coordination, and focused policy support for smallholder coffee growers will be necessary to achieve inclusive upgrading.

Policy Implications

The study underscores the need for comprehensive policy interventions to strengthen the competitiveness, sustainability, and resilience of India's coffee value chains. To reduce climate-related production risks in key coffee-growing regions, priority should be given to climate adaptation strategies such as agroforestry, shade-grown cultivation, rainwater harvesting, and drought-resistant coffee varieties. Increasing smallholder adoption of sustainable practices requires enhanced institutional support through technical training, extension services, and farmer awareness programs. The study also emphasizes the importance of inclusive, affordable certification processes to improve market access and value realization for small- and medium-sized importers. Group-based certification models, financial assistance, and simplified compliance procedures can help ease the burden of sustainability standards and traceability requirements under new international regulations, including the European Union Deforestation Regulation (EUDR). Investing in digital infrastructure, traceability systems, and precision farming technologies will further enhance productivity, transparency, and export readiness. Finally, policies that promote value-added specialty coffee branding and expand export destinations beyond traditional European markets are essential for long-term competitiveness and reduced dependence on external markets.

Conclusions

The study used both quantitative and qualitative methods to look at resilience, sustainability, and competitiveness in the Indian coffee value chain. Findings show that the industry has seen moderate growth in production and exports, with robusta coffee becoming more common because it handles climate change better. Still, the industry faces major challenges like market concentration, price swings, climate changes, and unfair value distribution along the supply chain.

The study also found that better market access and premium pricing, along with sustainable

farming and certification programs, help improve productivity, protect the environment, and raise farmer incomes. But small farmers do not adopt these practices evenly because of high costs, limited technical knowledge, and weak support from institutions. The findings highlight that digital traceability systems and market diversification are becoming more important for export competitiveness and long-term resilience in the coffee sector.

In summary, the study highlights the need for policies that support climate adaptation, stronger institutions, digital tools, farmer training, and fair value chain improvements to build a resilient and sustainable coffee sector in India. Future research should use primary surveys and advanced data analysis to provide detailed, reliable insights across different regions. Areas for further study include climate-yield modeling, consumer preferences for specialty coffee, blockchain traceability, and the effects of certification on smallholder livelihoods.

References

Abhinav, M. and Kuruvila, A. 2021. Indian coffee: A quadragenary growth analysis. *Econ. Aff.* **66**(3): 515–519.

Anil Kumar, N.P., Saleem Khan, A.I.K. and Balakrishnan, V. 2018. Coffee, climate and biodiversity: Understanding the carbon stocks of the shade coffee production system of India. In: *Handbook of Climate Change and Biodiversity*, Springer, Singapore, pp. 113–134.

Babu, P., Nagaraj, N., Gokavi, B., Rudragouda, C.S. and Reddy, V.B. 2019. Value chain upgrading strategies for integration of Indian small coffee growers in global coffee value chain. *Econ. Aff.* **64**(4): 855–861.

Blackman, A. and Rivera, J. 2011. Producer-level benefits of sustainability certification. *Conserv. Biol.* **25**(6): 1176–1185.

Bozzola, M., Charles, S., Ferretti, T., Gerakari, E., Manson, H., Rosser, N. and von der Goltz, P. 2021. *The Coffee Guide*. 4th edn. International Trade Centre, Geneva, Switzerland, 332 p.

Bunn, C., Läderach, P., Ovalle Rivera, O. and Kirschke, D. 2015. A bitter cup: Climate change profile of global production of Arabica and Robusta coffee. *Clim. Change* **129**(1): 89–101.

Byrareddy, V.M., Kath, J., Kouadio, L., Mushtaq, S. and Geethalakshmi, V. 2024. Assessing scale-dependency of climate risks in coffee-based agroforestry systems. *Sci. Rep.* **14**: 8028.

Chengappa, P., Devika, C. and Manjunatha, A. 2019. Coffee value chains in India: Exploring sustainability-oriented markets. *Agric. Econ. Res. Rev.* **32**(1): 91–104.

Chopra, A. and Kundu, A. 2008. The Fair Tracing project: Digital tracing technology and Indian coffee. *Contemp. South Asia* **16**(2): 217–230.

Gana Shruthy, M.K., Kumar, P. and Yadav, J.P. 2016. Sustainable coffee marketing: Challenges and the way forward. *Indian J. Mark.* **46**(1): 35–48.

Gereffi, G. 2019. *Global Value Chains and Development: Redefining the Contours of 21st Century Capitalism*. Cambridge University Press, Cambridge, UK, 494 p.

Jagadeesh, M., Jahnavi, A., Vinay, H., Abhishek, G., Abhishek, S. and Chikkalaki, A.S. 2024. Export competitiveness of Indian coffee: Analysing trade potential in the global market. *J. Sci. Res. Rep.* **30**: 51–61.

Kaplinsky, R. 2004. *Competition Policy and the Global Coffee and Cocoa Value Chains*. Paper presented at the United Nations Conference on Trade and Development (UNCTAD), Geneva, Switzerland.

Kodigehalli, B.V. and Wolfgang, B. 2011. *Value Chain Analysis for Coffee in Karnataka, India*. Unpublished Ph.D. Thesis, Ghent University, Belgium; Agrocampus Ouest, France; Humboldt University of Berlin, Germany; Slovak University of Agriculture, Nitra, Slovakia; and University of Pisa, Italy, in collaboration with Wageningen University, The Netherlands.

Kundu, A. and Chopra, A. 2009. The Fair Tracing project: Mapping a traceable value chain for Indian coffee. *Contemp. South Asia* **17**(2): 213–223.

Nadaf, S.A., Shivaprasad, P., Babou, C., Hariyappa, N., Chandrashekar, N., Kumari, P. and Nagaraja, J. 2024. Coffee (*Coffea* spp.). In: *Soil Health Management for Plantation Crops: Recent Advances and New*

Paradigms (George V. Thomas and V. Krishnakumar, eds.), Springer Nature Singapore, Singapore, pp. 337–389.

Pham, H.G., Chuah, S.H. and Feeny, S. 2022. Coffee farmer preferences for sustainable agricultural practices: Findings from discrete choice experiments in Vietnam. *J. Environ. Manage.* **318**: 115627.

Ponte, S. 2004. *Standards and Sustainability in the Coffee Sector: A Global Value Chain Approach*. International Institute for Sustainable Development and United Nations Conference on Trade and Development, Winnipeg, Canada, 52 p.

Pyk, F. 2018. *Determinants Influencing the Performance of Fair Trade Coffee Farmers in Tanzania*. M.Sc. Thesis, Swedish University of Agricultural Sciences, Uppsala, Sweden, 56 p.

Radimersky, M. and Ulbrichtova, K. 2016. *Coffee Trade in Developing Countries*. B.Sc. Thesis, Mendel University, Brno, Czech Republic, **57** p.

Raman, T.S., Gonsalves, C., Jeganathan, P. and Mudappa, D. 2021. Native shade trees aid bird conservation in tea plantations in southern India. *Curr. Sci.* **121**(2): 294–305.