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PERSPECTIVES AND MARKETING PROBLEMS OF ORGANIC GREEN CARDAMOM IN IDUKKI DISTRICT, KERALA

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ABSTRACT
Organic green cardamom cultivation has emerged as a rapidly expanding agricultural practice in the high-altitude zones of Kerala, driven by rising domestic and international demand for sustainably produced, chemical-free spices. Idukki District, which contributes the largest share of India's cardamom output, holds significant promise for scaling organic production. However, despite this potential, farmers encounter persistent structural and marketing challenges when shifting to and maintaining certified organic systems. This empirical study, conducted in 2025, investigates the production environment, certification processes, marketing mechanisms, and value-chain constraints shaping the experiences of organic cardamom growers in Idukki.

The study adopts a mixed-method research design, combining quantitative data from field surveys with 150 certified and transitioning organic farmers alongside qualitative insights from key informant interviews and field observations. The results reveal multiple barriers, including high certification fees, recurring audit and compliance requirements, limited access to collective marketing institutions, insufficient post-harvest infrastructure, and strong dependence on intermediaries. Price volatility, inconsistent auction performance, and inadequate access to real-time market intelligence further diminish farmers' ability to secure premium prices.

While organic cardamom enjoys strong market demand and export potential, farmers capture only a modest portion of the final consumer price due to fragmented value chains and weak direct linkages with exporters and organized buyers. The study proposes a comprehensive roadmap featuring FPO-led group certification, decentralized drying and curing units, digital spice marketplace integration, improved branding and traceability systems, and targeted financial and institutional interventions. These measures can enhance income stability, strengthen market competitiveness, and ensure the long-term sustainability of organic cardamom cultivation in Idukki.

Keywords: *Organic Green Cardamom, Marketing Constraints, Value Chain Analysis, Certification Challenges, Idukki District.*

INTRODUCTION
Cardamom, often referred to as the "Queen of Spices," is one of India's most valuable spice commodities, with Kerala—particularly Idukki District—playing a dominant role in its production and export. Idukki accounts for the largest share of India's small cardamom cultivation, supported by favourable agro-climatic conditions, traditional expertise, and a well-established spice economy. In recent years, the global shift toward chemical-free, sustainably produced agricultural commodities has accelerated the demand for organically grown spices, positioning organic green cardamom as a high-value niche segment in both domestic and international markets. This trend aligns with consumer concerns regarding food safety, environmental conservation, and the long-term health impacts of conventional chemical-intensive farming.

Despite the apparent opportunities, the transition to organic cardamom cultivation presents significant challenges for farmers in Idukki. Organic farming requires strict adherence to certification norms, high conversion-period investments, and rigorous post-harvest handling to maintain quality standards. Marketing of organic cardamom is further constrained by fragmented value chains, limited direct market access, inconsistent price realization, and heavy dependence on intermediaries. While national and international markets demonstrate strong demand for certified organic spices, farmers often fail to benefit proportionately due to inadequate collective marketing mechanisms, limited bargaining power, and the absence of integrated digital and export-oriented platforms.

Given this context, systematic research is essential to identify the structural bottlenecks, market inefficiencies, and institutional gaps affecting organic cardamom growers. This study, conducted in 2025, examines farmer perspectives, certification realities, and value-chain challenges, with the objective of proposing sustainable strategies to enhance market access, improve income stability, and strengthen the overall competitiveness of organic green cardamom cultivation in Idukki District.

ISSN 2394 - 7780

REVIEW OF LITERATURE

The literature on cardamom cultivation, organic agriculture, and spice value chains highlights both the commercial potential of high-value spices and the complex institutional, infrastructural and market barriers that constrain smallholder benefits. Scholarship on cardamom in India emphasizes the crop's distinct agroecological advantages in the Western Ghats while documenting recurring problems in marketing efficiency, price transmission and export competitiveness (Indhushree & Kuruvila, 2021; Thomas, Rajeev & Sanil, 2019). These studies show that price formation for small cardamom is influenced by both local auction mechanisms and global demand–supply dynamics, with implications for farm-level income volatility (Indhushree & Kuruvila, 2021).

Regionally focused research from the Journal of Spices and Aromatic Crops provides detailed agronomic and trade analyses. Korikanthimath and Krishnamurthy (2022) review agronomic investigations and cropping systems, noting that sustainable shading, soil management and integrated pest management are necessary for yield stability factors particularly relevant when farmers convert to organic production. Arya Gopan and Mathews (2024) add a historical lens, demonstrating how policy regimes (including pre- and post-WTO trade environments) have shaped farm-level incentives and export performance for Indian cardamom, reinforcing the notion that institutional context matters for market outcomes.

Recent empirical work documents marketing inefficiencies and suggests that auction centres and intermediary networks often determine farmer returns. Sreedhar et al. (2024) measure marketing efficiency in Tamil Nadu and find that channel structure markedly affects the producer's share of the consumer rupee, a finding echoed by Murugan et al. (2024) who analyze governance and strategic interventions required for reviving the small cardamom sector. Collectively, these studies underscore two linked realities: (a) that cardamom's high unit value makes it sensitive to post-harvest handling and grading, and (b) that institutional arrangements auction systems, trader networks, cooperatives—shape how much of that value accrues at the farmgate.

The broader literature on organic agriculture and sustainability standards supplies an important complementary perspective. Pan-India surveys and economic assessments indicate that organic systems can deliver environmental benefits and potentially premium prices, but conversion entails transitional yield reductions, higher labour or management costs, and certification burdens (Reddy et al., 2022; Poonam et al., 2024). Meemken's (2020) review of sustainability standards finds mixed welfare outcomes for smallholders: while standards can open high-value markets, benefits are conditional on farmers' ability to meet compliance requirements and access collective marketing arrangements.

Market access and value-chain scholarship highlight structural constraints common across high-value agriculture. Reardon and Minten (2021) and Jaffee, Henson, and Diaz-Rios (2019) argue that modernization of food value chains through aggregation, processing capacity, and integration with organized buyers is central to enabling smallholders to capture greater value. Narayanan (2020) and Sundaram & Krishnan (2022) emphasize the role of digital platforms and improved market information in reducing transaction costs and countering intermediary capture; digital integration has been shown to improve price transparency and bargaining power where infrastructural supports exist.

Specific to spices, the literature also stresses post-harvest losses and quality control as determinants of export readiness and price realization. Studies on spice post-harvest handling show that inadequate drying, inconsistent grading and suboptimal storage degrade volatile oil content and appearance, diminishing marketability challenges that are particularly acute for organically produced cardamom where chemical remediation is not an option (Anand & Varughese, 2023; Thomas et al., 2019). These technical weaknesses interact with market structure: without aggregation and certification support, smallholders face prohibitive per-unit costs for audits and limited capacity to meet buyer specifications (Harris & Stolton, 2021).

Taken together, the literature reveals several key gaps. First, while general findings suggest that group certification and FPO-led aggregation can reduce per-farmer certification costs and strengthen market access, localized empirical evidence on such interventions in Idukki's organic cardamom sector is sparse (Murugan et al., 2024; Meemken, 2020). Second, few studies combine granular post-harvest quality measurements with marketing channel analysis to quantify how improvements in drying/grading translate into price premiums for organic cardamom. Third, despite the potential of digital marketplaces, there is limited empirical work measuring real adoption and price effects of such platforms among hill-range smallholders (Sundaram & Krishnan, 2022). Finally, while international price volatility is well documented, its direct transmission to farmgate prices for organic cardamom in Idukki and the mediating role of auction systems—remains under-researched (Costa & Yu, 2022; Indhushree & Kuruvila, 2021).

ISSN 2394 - 7780

This study addresses these gaps by providing a 2025 empirical assessment of organic cardamom producers in Idukki that links certification costs, post-harvest practices, digital and auction participation, and marketing channel efficiency. By integrating field survey data with marketing margin analysis and governance considerations, it aims to produce actionable recommendations that align agronomic improvements with institutional reforms to increase farm-level value capture.

STATEMENT OF THE PROBLEM

Organic green cardamom cultivation in Idukki District has gained momentum in recent years due to rising consumer preference for chemical-free spices and the growing export demand for organically certified produce. Despite this promising market environment, organic cardamom farmers continue to face multiple challenges that limit the economic viability and long-term sustainability of organic production.

Farmers encounter high certification and renewal expenses, complex audit procedures, and limited institutional support for transitioning to organic systems. Marketing constraints such as heavy dependence on intermediaries, inconsistent auction prices, inadequate access to value-added processing facilities, and poor market intelligence further reduce their ability to secure premium prices. Although organic cardamom commands strong domestic and international demand, farmers' share in the final consumer price remains disproportionately low due to fragmented value chains, weak bargaining power, and insufficient branding or traceability mechanisms.

Moreover, there is limited empirical evidence examining how farmers in Idukki perceive organic cultivation, the specific marketing challenges they experience, and the extent to which these challenges affect profitability and market participation. The lack of systematic research on the perspectives of organic farmers and the structural bottlenecks in the organic cardamom value chain creates a critical knowledge gap.

Therefore, the present study seeks to analyze the perspectives of organic green cardamom growers in Idukki District and examine the major marketing problems they face. The insights from this study will support the development of targeted interventions and policy strategies aimed at strengthening the organic cardamom sector in Kerala.

NEED FOR THE STUDY

Organic green cardamom has emerged as a high-value crop with strong domestic and international demand, yet the transition to organic cultivation presents significant economic and institutional challenges for small and marginal farmers in Idukki District. Although Idukki remains the leading cardamom-producing region in India, limited research exists on the marketing constraints, certification hurdles, and value-chain inefficiencies specific to organic producers. Existing studies often focus on general spice cultivation or conventional farming systems, leaving a critical gap in understanding the unique dynamics of organic cardamom production.

Furthermore, despite the potential for premium pricing, farmers frequently fail to capture sufficient value due to weak market linkages, heavy intermediary dependence, fragmented supply chains, and inadequate post-harvest infrastructure. Understanding these constraints is essential for designing effective interventions that enhance marketing efficiency, improve income stability, and support sustainable agricultural development in Kerala's high-range regions. This study is necessary to generate evidence-based insights that can guide policymakers, certification bodies, FPOs, and market institutions in strengthening the organic spice sector.

OBJECTIVES OF THE STUDY

- To examine the socio-economic profile of organic green cardamom farmers in Idukki District.
- To analyze farmers' perspectives, motivations, and challenges in adopting organic cardamom cultivation.
- To identify and evaluate the major marketing problems faced by organic cardamom growers, including price volatility and market access barriers.
- To assess the influence of organic certification, compliance requirements, and post-harvest infrastructure on marketing outcomes.
- To propose suitable strategies and policy measures to enhance marketing efficiency and income stability for organic cardamom farmers.

HYPOTHESES OF THE STUDY

- **H1:** Socio-economic factors significantly influence the adoption of organic cardamom cultivation.
- **H2:** Certification costs and compliance requirements significantly affect farmers' marketing outcomes.

ISSN 2394 - 7780

- **H3:** Marketing constraints, including price volatility and intermediary dependence, significantly reduce premium price realization.
- **H4:** Post-harvest infrastructure availability significantly impacts the quality and market competitiveness of organic cardamom.
- **H5:** Stronger value-chain linkages significantly improve farmers' income stability and market participation.

SCOPE OF THE STUDY

The scope of this study is limited to the analysis of organic green cardamom cultivation and its associated marketing dynamics in Idukki District, Kerala India's primary cardamom-producing region. The study focuses on farmers who are fully certified as organic growers or are in various stages of transitioning to organic certification. It covers key aspects including socio-economic characteristics, adoption behaviour, certification requirements, post-harvest management, and marketing channels.

The research specifically examines farmers' perceptions, the constraints they face in organic production, market access issues, price realization patterns, and the role of intermediaries in shaping marketing outcomes. The study also includes an assessment of value-chain factors influencing farmers' share in consumer prices and the overall competitiveness of organic cardamom in domestic and export-oriented markets.

Geographically, the scope is restricted to major cardamom-growing regions of Idukki such as Udumbanchola, Devikulam, and Peerumedu and does not include non-organic cardamom farmers or spice markets outside the district. Institutional stakeholders like FPOs, auction centers, certification agencies, and traders are considered only to the extent that they affect farmer-level marketing performance.

The findings of this study are expected to support policymakers, agricultural extension systems, certification authorities, and market institutions in designing strategies to enhance marketing efficiency, income stability, and sustainability in organic cardamom cultivation.

RESEARCH METHODOLOGY

This study adopts a descriptive and analytical research design to investigate the production practices, marketing challenges, and value-chain dynamics associated with organic green cardamom cultivation in Idukki District, Kerala. The methodology integrates both quantitative and qualitative approaches to develop a holistic understanding of farmers' experiences and market realities.

RESEARCH DESIGN

A mixed-method research design was employed, combining:

- Quantitative methods (structured survey)
- Qualitative methods (key informant interviews, field observations)

This design ensures a comprehensive assessment of marketing problems, certification barriers, and value-chain inefficiencies affecting organic cardamom farmers.

Study Area

The research was conducted in the major cardamom-producing regions of Idukki District, specifically: Udumbanchola, Devikulam, Peerumedu.

These areas were selected due to their high concentration of organic growers and relevance to Kerala's cardamom economy.

Population and Sample Selection

The target population includes:

- Certified organic cardamom farmers
- Farmers transitioning to organic certification

Sampling Technique

A purposive sampling method was used to ensure adequate representation of organic and transitioning farmers.

Sample Size

A total of 150 respondents were selected for the survey.

ISSN 2394 - 7780

Data Collection Methods

Primary Data
Primary data were collected using:

- Structured questionnaires administered to farmers
- Key informant interviews with traders, auctioneers, FPO leaders, and certification officers
- Field observations of farms and post-harvest units

Secondary Data
Secondary information was obtained from: Spices Board publications, Government reports, Academic journals, Relevant agricultural and market databases

Tools and Techniques for Analysis
The following analytical tools were used to interpret the data:

- Descriptive statistics (frequency, percentage, mean) to analyze farmers' socio-economic characteristics and perceptions
- Garrett Ranking Technique to prioritize major marketing constraints
- Value-chain mapping to evaluate market flows, pricing distribution, and stakeholder roles
- SWOT Analysis to assess strengths, weaknesses, opportunities, and threats
- Chi-square tests (where applicable) to test the association between variables

Study Period
The study was conducted during the year 2025, covering data collection, analysis, and interpretation.

DATA ANALYSIS
The study analysed primary data collected from 150 organic and transitioning green cardamom farmers in Idukki District. Statistical tools such as percentages, descriptive statistics, Chi-square, ANOVA, and multiple regression were applied using SPSS 27.

Socio-Economic Profile of Respondents

Table 1: Demographic and Farm Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Age	Below 35	22	14.7
	35–50	61	40.7
	Above 50	67	44.6
Education	Primary	29	19.3
	Secondary	54	36.0
	Higher Secondary	38	25.3
	Graduate & Above	29	19.3
Farm Size	< 2 Acres	48	32.0
	2–5 Acres	67	44.7
	> 5 Acres	35	23.3
Farming Experience	< 10 Years	31	20.7
	10–20 Years	59	39.3
	> 20 Years	60	40.0

Interpretation: Most organic farmers are experienced (>20 years), moderately educated, and manage small to medium farms.

Farmers' Perspectives Toward Organic Cardamom
A Likert-scale assessment (1 – Strongly Disagree to 5 – Strongly Agree) measured farmers' attitudes.

Table 2: Mean Scores of Farmers' Perceptions

Statement	Mean	SD	Interpretation
Organic cardamom fetches better long-term income	4.21	0.61	High agreement
Organic cultivation improves soil health	4.44	0.52	Very high agreement

ISSN 2394 - 7780

Certification procedures are difficult	4.08	0.77	High agreement
Market access for organic produce is limited	3.98	0.82	Moderately high
Dependence on intermediaries reduces income	4.32	0.67	High agreement

Interpretation: Farmers strongly acknowledge sustainability benefits but report serious marketing difficulties.

Major Marketing Problems Faced by Farmers

Table 3: Marketing Problems Ranked by Weighted Mean Score

Marketing Problem	Weighted Mean	Rank
Price volatility	4.51	1
High certification & renewal cost	4.43	2
Intermediary dependence	4.37	3
Poor post-harvest infrastructure	4.28	4
Lack of direct export linkages	4.11	5
Inadequate grading & branding	3.89	6

Interpretation: Price instability and certification costs are the most severe barriers.

ANOVA: Impact of Farm Size on Market Access

Hypothesis Tested:

- **H_0:** Farm size does not significantly influence access to premium organic markets.
- **H_1:** Farm size significantly influences access to premium organic markets.

Table 4: ANOVA Results

Source	SS	df	MS	F	p-value
Between Groups	6.92	2	3.46	5.18	0.006
Within Groups	98.48	147	0.67		
Total	105.40	149			

Interpretation: Since $p = 0.006 < 0.05$, farm size significantly influences market access. Larger farmers are more likely to reach premium and export-oriented segments.

Regression Analysis: Factors Influencing Farmers' Market Income

Dependent Variable: Annual income from organic cardamom

Independent Variables:

X_1 = Certification cost, X_2 = Post-harvest infrastructure, X_3 = Intermediary dependence, X_4 = Value-chain linkages (FPO/digital), X_5 = Farm size

Table 5: Multiple Regression Results

Variable	β Coefficient	t-value	p-value	Interpretation
X_1 Certification cost	-0.312	-4.21	0.000	Significant negative impact
X_2 Post-harvest facilities	0.284	3.89	0.000	Significant positive impact
X_3 Intermediary dependence	-0.261	-3.47	0.001	Significant negative impact
X_4 Value-chain linkages	0.355	4.86	0.000	Strong positive impact
X_5 Farm size	0.168	2.13	0.035	Positive, significant

Model Summary: $R = 0.78$, $R^2 = 0.61$ (61% of variation explained), $F = 45.72$, $p < 0.001$

Interpretation: Certification cost and intermediary dependence decrease farmers' income, while post-harvest facilities and improved value-chain linkages significantly increase income.

FINDINGS FROM DATA ANALYSIS

- Organic farmers face severe price volatility, high certification expenses, and limited processing facilities.
- Value-chain participation through FPOs and digital platforms emerges as the strongest positive income driver.
- Larger farmers experience better market access and export opportunities compared to smaller holdings.
- Intermediaries still dominate the marketing channel, reducing farmers' ability to secure premium prices.

ISSN 2394 - 7780

- Post-harvest improvements significantly enhance product quality and grade, increasing market competitiveness.

FINDINGS

The major findings derived from the statistical analysis and field observations are summarized below:

- **Socio-economic characteristics influence adoption:** Most organic cardamom farmers belonged to the 35–50 and 50+ age groups, had moderate education, and possessed long farming experience. ANOVA showed that farm size significantly influences access to premium markets, indicating structural disparities in organic market participation.
- **Farmers perceive organic cultivation as beneficial, but challenging:** Respondents strongly agreed that organic farming improves soil quality and ensures long-term sustainability. However, they cited complex certification procedures, high compliance requirements, and inadequate institutional support as major barriers.
- **Price volatility is the single largest marketing problem:** Price fluctuations in the Spices Board auctions and private markets emerged as the most severe constraint (Weighted Mean = 4.51). The lack of transparent price information reduces bargaining power and income stability.
- **Certification and renewal costs significantly reduce income**: Regression analysis showed that certification cost has a strong negative effect on farmers' market income ($\beta = –0.312$, $p < 0.001$). Individual certification remains unaffordable for many smallholders.
- **Post-harvest infrastructure remains inadequate**: A majority of farmers reported inadequate access to scientific curing, drying, and grading units. Post-harvest deficiencies lead to lower quality grades, restricting access to premium and export markets.
- **Heavy dependence on intermediaries' limits price realization:** Intermediary reliance negatively impacts income ($\beta = –0.261$). Small farmers rarely engage in direct selling or contract-based procurement due to weak institutional linkages and lack of market information.
- **Weak value-chain integration limits farmers' share of consumer price:** Fragmented supply chains, lack of organized buyer networks, and limited FPO involvement reduce farmers' ability to capture value. Only 12% of farmers had access to digital marketplaces or direct export channels.
- **Value-chain linkages significantly improve market outcomes:** Better market linkages through FPOs, collective marketing, digital spice platforms, and direct sales showed the strongest positive impact on income ($\beta = 0.355$, $p < 0.001$). This confirms the potential of institutional strengthening to improve competitiveness.
- **Organic cardamom has strong demand, but weak farmer benefits:** Despite high domestic and export demand, farmers capture only a small portion of the final consumer value due to quality inconsistency, limited branding, and weak negotiation capacity.

SUGGESTIONS

- Promote direct marketing, digital trading, and contract farming to improve market access and price realization.
- Simplify organic certification through single-window centres, subsidies, and group certification models.
- Strengthen post-harvest infrastructure including curing units, grading centres, storage, and quality testing facilities.
- Enhance farmer capacity through regular training, digital literacy, and model organic demonstration farms.
- Strengthen institutional support by empowering FPOs, expanding Spices Board initiatives, and improving credit access.
- Ensure income stability through floor-price mechanisms and organic-specific crop insurance.
- Promote export competitiveness through trade fair participation, branding, and traceability systems.
- Encourage sustainable, climate-resilient organic cardamom cultivation by promoting bio-inputs and resilient varieties.

CONCLUSION

Organic green cardamom cultivation in Idukki District presents significant opportunities for enhancing farmer income, securing premium market prices, and positioning Kerala as a leading source of sustainably produced spices. The study reveals that although farmers are motivated by rising global demand and health consciousness, they continue to face substantial challenges related to certification costs, compliance procedures, marketing inefficiencies, and inadequate post-harvest infrastructure. Price volatility and dependence on intermediaries further limit their ability to capture the full value of organic produce, while fragmented value-chain linkages constrain direct access to high-value domestic and export markets.

Despite these constraints, the findings demonstrate that organic cardamom has strong economic potential, provided that structural bottlenecks are addressed through targeted institutional, financial, and technological interventions. Strengthening FPO-led aggregation, improving quality testing and curing facilities, simplifying certification systems, and expanding digital market platforms can significantly boost farmers' competitiveness. Furthermore, climate-resilient cultivation practices, enhanced capacity-building programs, and robust traceability systems can help sustain long-term market trust and environmental resilience.

Overall, the study underscores the need for a coordinated approach involving farmers, government agencies, the Spices Board, cooperatives, and private sector institutions to build an efficient, transparent, and inclusive value chain for organic cardamom in Idukki. With appropriate policy support and market-driven reforms, organic cardamom farming can evolve into a highly profitable, environmentally sustainable, and globally competitive agricultural enterprise for smallholders in the region.

FUTURE SCOPE

The growing demand for organic spices offers considerable future opportunities for expanding organic cardamom cultivation in Idukki. Further research is required to quantify long-term economic gains from organic versus conventional farming using multi-year cost–benefit models. There is also potential to explore advanced digital tools—such as blockchain traceability, AI-based price forecasting, and mobile market-intelligence platforms—to strengthen transparency and farmer decision-making. Future studies can focus on evaluating the effectiveness of FPO-led group certification and decentralized processing hubs in reducing costs and improving marketing efficiency. In addition, climate change impacts on organic cardamom productivity, pest dynamics, and soil health warrant deeper scientific investigation. Comparative studies across major spice-growing regions in India and international organic spice clusters can provide broader insights for policy harmonization and export competitiveness. Overall, the future scope lies in integrating technology, climate resilience, institutional innovations, and global market alignment to unlock the full potential of organic cardamom farming in Idukki.

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