

Digital Transformation in the Spice Sector: An Analytical Study of Cardamom Marketing in Idukki District

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Abstract: Idukki District in Kerala, serves as the global hub for high-quality small cardamom production. However, traditional supply chains in this mountainous region remain heavily dependent on multi-tiered intermediary networks and conventional auction systems, which often dilute profits for local growers. In the agriculture industry, digital marketing plays a central role in increasing the profits of cardamom planters. This study investigates the strategic adoption of digital marketing by cardamom planters in Idukki. It explores how modern e-commerce models, social media avenues and electronic business-to-business (B2B) networks can transform traditional trade. Utilizing a mixed-methods research design, empirical data was gathered through a structured survey of cardamom planters across Udumbanchola, Peerumade, Idukki and Devikulam taluks. Growers of cardamom who choose to e-market their product at various stages can benefit from e-marketing. Due to lack of e-NAM execution, e-marketing of agricultural produce is not gaining the necessary traction in those states. A survey conducted among the ranchers adopting this marketing strategy gives a direct evaluation of it. Therefore, a thorough understanding of e-marketing, its advantages, problems and opportunities in this industry is required. This understanding should also include how these innovations can be leveraged for effective marketing. It is therefore necessary to focus on how farmers perceive the benefits and needs of e-marketing. Hence, it is an inducing factor for author to conduct study on digital marketing strategies for cardamom planters in Idukki district also to analyze the opportunities and constraints.

Keywords: E-Marketing, ICT, Digital Technologies, E-NAM, Agri-commerce, Government Support and Sustainability.

Introduction

Digital marketing strategies are essential for increasing brand awareness and attracting new online customers for agricultural businesses. The promotion of brands, products and services through online platforms and digital technology is known as digital marketing. Increased online visibility through digital marketing can help more potential customers find agricultural businesses. Long-term revenue can be improved by increasing website traffic, leads and modifications through the use of effective digital marketing strategies and missions. The cardamom market in future will, in general, be essential for organisation to understand the market landscape, discern learning experiences related to methodologies, services and clientele, mitigate risks such as financial variables, impact business, restrict risks and gain insight into market trends such as current trends, advancements, buyer inclinations, elements, top-cutting pursue informed decisions and achieve reasonable development in a serious business climate. Crucial elements include information-driven knowledge, assessing methods, customer loyalty, the upper hand and approved strategies like long-term business outcomes. The market is evolving swiftly in tandem with the business's ongoing growth. Advances in innovation have provided the current organisation with a variety of benefits that enable regular financial transactions. Therefore, in order to improve planning, a company should really take note of market developments. An effective approach gives the organisation a head-start on planning and a competitive advantage over rivals. Digital marketing is a reliable resource for obtaining market reports that will provide one with the leading business world in industry exploration. Lal, H. (2022)

Objectives Of the Study

1. To evaluate the current level of awareness and adoption rate of digital marketing strategies among cardamom planters in Idukki.
2. To analyse the socio-economic and structural constraints (such as price volatility, rugged terrain logistics, and rigid grading systems) hindering successful digital trade.
3. To propose a strategic framework for policymakers, cooperatives and planters to optimize digital Agri-commerce in the spice sector.

Statement Of the Problem

The introduction of e-auctions and digital marketing channels in Idukki District was intended to eliminate intermediaries and ensure fair price for cardamom planters, the digital transition has introduced critical systemic challenges that threaten the financial sustainability of growers. Planters experience severe cash-flow distress due to prolonged payment delays from electronic auctioning agencies, forcing them into high-interest debt cycles. Large-scale traders exploit the electronic bidding system through unregulated re-pooling, artificially distorting auction prices to the detriment of primary producers. Stringent regulatory prerequisites, such as the mandatory Cardamom Registration (CR) certificate, lock out a vast number of smallholders operating on unregistered lands, cutting them off from direct digital trade. Digital literacy gap is another setback among the planters due to which online brand-building and predictive price data, growers remain highly dependent on centralized intermediaries rather than successfully executing direct-to-consumer digital marketing. This study aims to analyse these systemic gaps and evaluate their economic impact on local planters.

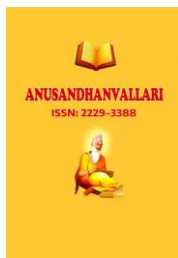
Reviews Of Related Literature

Scaria et al. (2025) evaluated the impact of Direct-to-Consumer (D2C) platforms (such as local Agri-tech startups like *Farmers Fresh Zone*) in Kerala. They proved that digital branding allows farmers to bypass middlemen entirely, secure higher price premiums, and minimize post-harvest waste through demand-driven harvesting.

Aithal et al. (2022) noted that despite generating significant yield and revenue, smallholder spice farmers in South India frequently face compressed profit margins. This is heavily attributed to high commission charges, unfair price deductions by local brokers, and steep localized transport costs.

Bist, Pratibha & Bhatt, Prashant. (2021) have conducted research and found that the large cardamom plant is a flavorful crop with a high potential yield. The largest producer of enormous cardamom is Nepal. The review study's main focus is on the conditions surrounding the development, promotion, and products in Nepal's massive cardamom industry. The massive cardamom is thought to be developing at an increasing rate, but its efficiency was declining. The assortments are being enlisted at this time. The enormous cardamom status of the nation can be raised by delivering the item with quality norm through specialised preparation and studio from public and confidential area.

Paudel, Anup & Malla, Shraddha. (2020) have written an article that was intended to identify the current state of massive cardamom production and marketing in Nepal, ranging from local to global contexts. The analysis revealed that the majority of people living on the eastern slope had power over the massive cardamom crop. Its production has not increased at a typical rate, despite the growth in global demand for cardamom and the planting of massive amounts of the plant in Nepal. Ranchers learned about a range of quality and price variations following the adoption of the business cultivation process. The massive cardamom's marketing channel was limited to a particular assortment focus in the eastern region. Roughly



90-95 percent of the massive amounts of cardamom that were delivered to the country were exchanged. India was the main buyer of cardamom. The lack of innovation and the increase in cost were major problems encountered during the creation and marketing process.

Bhandari, Nirajan & Bhandari, Thaneshwar. (2018) have conducted a review and used a means to assess the state of cardamom endeavours in one of the pocket areas of significant cardamom creation in Teharthurm Locale, eastern Nepal. The boundaries that were used included the area where cardamom is produced, the type of fertiliser that is used, drying offices, the specialised skills of ranchers, market channels and variable expenses. According to the study, the most common marketing strategy was making direct offers to dealers who were located in the settlement region. Many factors affected the enormous cardamom's efficiency. For instance, the number of dynamic relatives, the cultivating period, the region, the intercultural tasks, the variable expense and the devalued fixed cost explained nearly 75.2% of the variation in efficiency.

Digital Marketing Platform for Agricultural Product

Conventional marketing provides coverage targeting, which targets different consumers with different backgrounds and interests. This suggests that traditional marketing approaches often target consumers who aren't interested in what is being offered. However, digital marketing enables targeted and tailored marketing messages to reach specific customer groups based on their interests, hobbies, socioeconomic status and more. The possibilities are endless. As a result, one can market their services to more people who might become clients, boosting sales and revenue. With so many available digital marketing tools and programming options, it is definitely possible to measure and monitor the results of digital marketing initiatives. Boroowa, D. K., & Dutta, K. (2022)

Conventional marketing efforts are difficult to measure, making it impossible to track the development of methodologies. It is attempting to replicate the results of traditional marketing campaigns, which makes it difficult to know if procedures and conjecture are worthwhile in the long run. One doesn't have to worry about wasting money on systems that aren't generating revenue for their company because it is easy to measure and monitor the results of digital marketing initiatives. This suggests that they will be able to obtain a larger return on their investment. The global cardamom market is poised for significant growth between 2022 and 2030, with a promising outlook through 2022 and beyond. The market is expected to expand as key players in the industry adopt compelling methodologies, creating a number of new opportunities for advancement.

Digital Marketing Strategies for Cardamom Planters

A major factor in determining the zest ranchers' compensation and benefits is marketing. The functional definition of e-marketing is the promotion of cardamom through various electronic trading platforms. The tasks involved in developing produce from the planters to the final buyers are operationalized as marketing. In India, the Flavours Board had introduced the main e-sell off focus in order to combat the problems inherent in cardamom clamour closeout on the attraction of cardamom planters. There were forty purchaser terminals at this e-sell off focus. With sixty terminals, the e-closeout focus that followed was established in Vandanmedu, Idukki, Kerala in December 2007. Because e-closeout encourages a fair competition among bidders, it is beneficial to cardamom growers as well as brokers. Exchanges are electronically verified and a sincere offer is used to determine the base cost. The approved sellers in the new framework receive a client ID and secret word. Only the name of the most notable bidder appears on the bartering experts' terminal. Every parcel held in the closeout has a main showcase board that displays the part number, quantity, number of sacks and the current highest bid. The closeout interaction has become more transparent in the e-sale off framework.

Various online marketing tools for cardamom include website marketing and web-based entertainment. Daily basis in various media, live sales to the general public, which can be used in conjunction with cost analysis and marketing pattern analysis, steady interest in and recognition of the product and valuation through simple cycles. In contrast to the traditional cardamom marketing methods, e-closeout is a completely legal and safe marketing system where value disclosure is simple compared to conventional marketing. Taking part in an electronic closeout necessitates that buyers adhere to particular guidelines and requirements, ensuring the system's dependability.

Analysis Part of the Study

From 200 randomly selected cardamom planters, details were collected for the study especially from Idukki district. Following are the summarized result of data collected from the respondents about their perception on digital marketing strategies to be used by cardamom planters for marketing:

Table 1 Scale of Cardamom Plantation by the Planters

Scale	Frequency	Percent	Cumulative Percent
Small	28	14	14.00
Medium	78	39	53.00
Large	94	47	100.00
Total	200	100	

Source: Primary data

Table 2 Perception of the Respondents towards Benefits of Digital Marketing on Cardamom Marketing

Benefits	SA	A	N	DA	SDA	Mean	S.D.
Access to live auctions makes it easier to analyse price ranges and marketing trends (B1)	40	26	21	8	5	2.25	1.313
Buyers must abide by specific rules and guidelines in order to participate in an e-auction, which guarantees their credibility (B2)	27	34	26	7	6	2.50	1.299
Continuous acceptance and demand for the product (B3)	28	32	23	10	7	2.49	1.307
Defense against changes in price (B4)	31	37	20	7	5	2.31	1.245
Every day, new market data is updated and made available across multiple media (B5)	33	35	21	7	4	2.28	1.240
Guaranteed prompt payment to farmers and timely shipping of cardamom to buyers (B6)	19	44	23	10	4	2.49	1.159
Guarantees a competitive price in contrast to traditional marketing (B7)	40	27	21	7	5	2.24	1.311
In social media and website marketing, there are few	43	29	19	6	3	2.10	1.235

middlemen and short marketing channels (B8)							
Produce that has been graded may be sold for a higher price (B9)	35	31	23	6	5	2.32	1.302
Setting prices using open and honest procedures (B10)	43	29	21	4	3	2.12	1.258
The correct invoices and transaction information are accessible (B11)	37	31	20	8	4	2.23	1.254
There is no informational disparity between sellers and buyers (B12)	27	33	24	8	8	2.53	1.329
Totally safe and compliant marketing system (B13)	27	32	24	10	7	2.52	1.306
When compared to traditional marketing, there is less farmer exploitation by middlemen (B14)	25	41	19	10	5	2.38	1.196
When comparing price discovery to traditional marketing, it is simple (B15)	23	37	25	7	8	2.58	1.304

Source: Primary data

It is clear from Table 2, all the statements asked related to perception of the respondents towards benefits of digital marketing on cardamom marketing the maximum of the respondents have opined agree and strongly agree. And the statement '*when comparing price discovery to traditional marketing, it is simple*' secured top mean score.

Table 3 One-way ANOVA Test to Analyse Significance between Scale and Perception of the Respondents towards Benefits of Digital Marketing on Cardamom Marketing

		Sum of Squares	d.f.	Mean Square	F	Sig.
B1	Between Groups	.763	2	.381	.218	.805
	Within Groups	169.987	97	1.752		
	Total	170.750	99			
B2	Between Groups	4.234	2	2.117	1.262	.288
	Within Groups	162.766	97	1.678		
	Total	167.000	99			
B3	Between Groups	.951	2	.476	.275	.761
	Within Groups	168.039	97	1.732		
	Total	168.990	99			
B4	Between Groups	.836	2	.418	.266	.767
	Within Groups	152.554	97	1.573		
	Total	153.390	99			

B5	Between Groups	.789	2	.395	.253	.777
	Within Groups	151.371	97	1.561		
	Total	152.160	99			
B6	Between Groups	3.591	2	1.795	1.346	.045
	Within Groups	129.399	97	1.334		
	Total	132.990	99			
B7	Between Groups	.642	2	.321	.184	.832
	Within Groups	169.598	97	1.748		
	Total	170.240	99			
B8	Between Groups	3.674	2	1.837	1.209	.003
	Within Groups	147.326	97	1.519		
	Total	151.000	99			
B9	Between Groups	4.404	2	2.202	1.307	.275
	Within Groups	163.356	97	1.684		
	Total	167.760	99			
B10	Between Groups	5.788	2	2.894	1.862	.051
	Within Groups	150.772	97	1.554		
	Total	156.560	99			
B11	Between Groups	1.646	2	.823	.518	.597
	Within Groups	154.064	97	1.588		
	Total	155.710	99			
B12	Between Groups	6.625	2	3.312	1.909	.154
	Within Groups	168.285	97	1.735		
	Total	174.910	99			
B13	Between Groups	.921	2	.461	.266	.767
	Within Groups	168.039	97	1.732		
	Total	168.960	99			
B14	Between Groups	7.650	2	3.825	2.771	.048
	Within Groups	133.910	97	1.381		
	Total	141.560	99			
B15	Between Groups	1.358	2	.679	.394	.675

	Within Groups	167.002	97	1.722		
	Total	168.360	99			

Source: Primary data

It is evident from Table 3, the benefit factors guaranteed prompt payment to farmers and timely shipping of cardamom to buyers (B6), in social media and website marketing, there are few middlemen and short marketing channels (B8), setting prices using open and honest procedures (B10) and when compared to traditional marketing, there is less farmer exploitation by middlemen (B14).

Table 4 Analysis on Constraints of Digital Marketing Perceived by the Cardamom Planters

Constraints	SA	A	N	DA	SDA	Mean	S.D.
A cardamom registration (CR) certificate is needed to participate in an e-auction, which makes it challenging for farmers who grow on unregistered land to sell without one (C1)	26	35	26	9	4	2.47	1.243
After the e-auction, payment is delayed for up to 20–30 days, which causes financial hardship (C2)	42	26	20	7	5	2.20	1.310
Along with planters, traders are taking part in the e-auction; the prices offered for their lots are greater than those for the farmers (C3)	36	31	22	6	5	2.29	1.297
Farmers are compelled to borrow money from the auctioning company, paying interest, and being taken advantage of in the process, in order to receive early payment (C4)	29	39	22	6	4	2.33	1.223
Farmers are compelled to sell their produce at the price specified in the online auction since they lack the ability to negotiate (C5)	30	38	22	6	4	2.32	1.230
Farmers' produce has a shorter bidding period than traders' produce, which prevents farmers from getting the best auction price (C6)	30	44	16	8	2	2.16	1.089
It is not feasible to sell at real-time prices because of the significant lag between pricing and payment (C7)	23	44	19	9	5	2.39	1.180
Longer marketing campaign and comparatively greater involvement of middlemen in an online auction (C8)	26	40	20	9	5	2.38	1.213
Produce loses value when its green colour fades, so farmers are compelled to sell quickly (C9)	36	27	23	7	7	2.38	1.362
Produce samples that are on display during an online auction are taken by the auctioning company and are not part of the sales (C10)	32	33	25	7	3	2.34	1.249
Spices Board oversight and regulation of the e-auction	33	31	21	8	7	2.38	1.324

system is deficient (C11)							
The farmers do not personally participate in the e-auction process when selling their produce (C12)	33	31	23	7	6	2.38	1.316
The price in an e-auction will not increase because there are no buyers from within the state who can participate in it, and buyers from outside have a set price cap for bidding (C13)	39	34	19	6	2	2.11	1.180
The price offered in the e-auction is determined by the lot number; lots positioned at the start and finish of the auction will not have any competition for bids (C14)	26	42	21	8	3	2.33	1.164
There is inconvenient transportation to the agency's cardamom collection locations (C15)	35	33	21	7	4	2.26	1.252
Traders in e-auction re-pool with inferior cardamom, which lowers the average auction price (C16)	42	28	19	6	5	2.17	1.295
When it comes to online and social media marketing, there shouldn't be any consistent demand (C17)	30	31	26	8	5	2.45	1.298

Source: Primary data

It is explored from Table 4, from all statements asked about constraints of digital marketing perceived by the cardamom planters the majority of the respondents opined 'strongly agree' and 'agree' and the statement '*A cardamom registration (CR) certificate is needed to participate in an e-auction, which makes it challenging for farmers who grow on unregistered land to sell without one*' secured top mean score.

Suggestions

- Forming Digital Marketing Cooperatives (FPOs) to pool resources with neighbouring planters to share the costs of building a single, high-quality e-commerce website, allowing smallholders to sell directly to consumers without individual financial strain.
- Launch B2B WhatsApp broadcast networks among local brokers targeting bulk buyers-like commercial bakers, sweet manufacturers and organic spice retailers-in major metro cities.
- Print unique QR codes on your packaging that link buyers directly to a short smartphone video of your Idukki plantation, proving the authenticity and premium Geographical Indication (GI) origin of your crop.
- Coordinate bulk dispatches through digital logistics aggregators to secure affordable, fast and moisture-controlled shipping from remote hilly terrains, preserving the crop's vital green colour.
- Diversify beyond traditional physical auctions by listing daily harvests on established national digital platforms like e-NAM (Electronic National Agriculture Market) and specialized B2B Agri-tech portals to attract national buyers.

Discussion and Conclusion

The development of e-marketing for agricultural products necessitates the active participation of the public as well as a private sector to provide structure, data and planning, all of which can contribute to competitive marketing in the region. Understanding the benefits and requirements of cardamom e-marketing could help evaluate the e-marketing's presentation and usefulness as well as the drawbacks of the framework. As a result, it may be used to suggest potential interventions that could increase ranchers'

acceptance of e-marketing. Although local merchants are actively involved in the marketing channel, value vacillation of case is a significant problem. The number of dynamic relatives involved, the cultivating period, the region, intercultural tasks, variable expense, and deteriorating fixed cost are the main factors affecting cardamom's efficiency in the area. If the massive cardamom could be delivered using more modern methods, avoiding diseases and microbes with established marketing channels and objections, this yield might prevent young people from moving from the mountains to other countries in search of employment opportunities. The world has been impacted by the internet, and any company with a website can now access a global market. The agro-industry is not an exception to this rule. In any case, considering effective marketing becomes important due to the perishable nature of agricultural products. It is critical to provide capacity, easy transportation, legitimate handling and bundling and information on online activities for marketing. India has small ranches and there is little information available about how ranchers use Information and Communication Technology (ICT) for agricultural marketing.

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