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The value leak: Marketing channel efficiency and value distribution in geographical indication rice varieties of Kerala

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Abstract

A rice variety can carry a government-certified tag of origin, sell at a premium in the market, and still leave its grower no better off, this is the paradox at the heart of Kerala's six Geographical Indication (GI) rice economies. This study traces where that premium actually goes, examining marketing channel efficiency and value distribution across Palakkadan Matta, Pokkali, Navara, Kaipad, Wayanadan Jeerakashala, and Wayanadan Gandhakashala rice, using primary data from 55 stakeholders spanning farmers, cooperatives, millers, wholesalers, and retailers. Nine distinct marketing channels were identified, and their performance was evaluated through Shepherd's Index, Acharya's Measure, and a purpose-built Composite Marketing Efficiency Index (CMEI) that integrates producer's share, price spread, marketing cost, and cost efficiency into a single normalized ranking. The results are striking in their consistency: direct farmer-to-consumer sale recorded the highest CMEI across every single variety (0.780-0.914), while intermediary channels lost 55-62 per cent of that efficiency on average, with the most heavily intermediated pathways in Kaipad and Gandhakashala collapsing to near zero. One variety broke the pattern, Navara, where extraordinary cost efficiency in one channel partly offset a weak producer's share, exposing a cost-value tension that single-indicator methods miss entirely but the composite index resolves. Constraint analysis further stated that labour shortage, climate variability, and logistics, emerged as the real barriers stakeholders faced. Together, these findings show that a GI tag alone cannot guarantee producers their fair share, the marketing channel decides that. The study offers a replicable diagnostic framework for GI product marketing systems and points policymakers toward channel-level intervention rather than continued certification expansion.

Keywords: Geographical indication, marketing efficiency, composite index, producer's share, GI rice, Kerala

1. Introduction

Geographical Indications (GIs) link product quality and reputation to territorial origin, aiming to let producers capture a price premium that would otherwise dissipate in anonymous commodity markets. GI protection schemes are increasingly explored worldwide as tools supporting local sustainable development, though this contribution depends on the strategies adopted by producers, cooperatives, and public agencies, and can be undermined by weak valorization design (Belletti, *et al.* 2017). Kaplinsky and Morris (2001)^[2, 6] provided the value chain framework that underlies much of this analysis, showing how value is created and distributed across production and marketing systems, with the greatest potential gains for smallholders typically residing in processing and direct marketing stages rather than in production itself. This framework is applied here directly to GI rice.

India's GI landscape has grown steadily, reaching 530 registered GIs by 2023 across agricultural, manufactured, and handicraft categories (Thirumarudhan *et al.*, 2025)^[15]. Yet

whether this registration activity translates into producer level gains is inconsistent and depends heavily on the commodity concerned. Jena and Grote (2012)^[5], studying Basmati cultivation in Uttarakhand, found that GI linked production increased household welfare relative to non-Basmati cultivation, one of the clearer positive cases in the literature. Kerala's six rice GIs, Navara, Palakkadan Matta, Pokkali, Kaipad, Wayanadan Jeerakashala, and Wayanadan Gandhakashala, tell a more uneven story despite strong quality credentials and long-standing reputations in specialty and Ayurvedic markets. Radhika *et al.* (2021)^[10], assessing the institutional performance of all six Kerala rice GIs, found that although average market prices rose after registration, gains were not consistently transmitted to producers, since registered proprietor bodies had not initiated participatory marketing and promotion processes for most varieties. A near identical pattern has recently been documented outside Kerala: Bhagat and Pathak (2025)^[3], studying GI tagged Jeeraphool rice in Chhattisgarh, found that farmers achieved profitable returns overall, but that the specific marketing

channel used, rather than GI status itself, largely determined how much of the final price actually reached the farm gate. The methodological basis for examining this channel level mechanism is well established in Indian agricultural marketing economics. The Acharya and Agarwal framework, which extends Shepherd's original cost-based efficiency measure by incorporating marketing margins, remains the standard tool for comparing channel performance. Raina *et al.* (2024)^[12], applying this framework to potato marketing in Himachal Pradesh, found that a direct farmer to consumer channel achieved more than twice the marketing efficiency of a channel involving traders, wholesalers, and retailers combined. This pattern extends to rice specifically. Dey and Singh (2025)^[4] combined the Acharya and Aggarwal composite index with propensity score matching to show that market participation raises paddy farm income in eastern India, with channel choice shaped significantly by education, access to price information, and distance to market. At a national scale, Naik and Mohan (2026)^[9] found, using nationally representative survey data, that awareness of minimum support price and access to technical advice significantly shaped farmers' choice between government administered and private marketing channels for paddy. Despite this consistent evidence that channel structure drives marketing performance, single efficiency measures capture only part of the picture: Shepherd's Index reflects cost efficiency while remaining insensitive to how margins are distributed, and Acharya's Measure privileges value transmission without fully reflecting absolute cost differences across channels of unequal length. Composite indicators offer a proven remedy to this kind of multidimensional measurement problem elsewhere in agricultural research. Talukder, *et al.* (2017)^[14], in developing composite sustainability indicators for coastal farming systems in Bangladesh, demonstrated that min-max normalization remains one of the most widely used techniques for such construction, since it rescales indicators of different original units onto an identical, interpretable range, a property directly relevant to combining rupee denominated cost measures with percentage-based share measures.

This study builds on that base by constructing a Composite Marketing Efficiency Index that integrates producer's share, price spread, marketing cost, and Shepherd's Index into a single normalized measure, applied consistently across nine identified marketing channels and six GI rice varieties of Kerala. In doing so, it extends the institutional evidence of Radhika *et al.* (2021)^[10] with transaction level economic quantification and links channel level efficiency outcomes to stakeholder reported constraints. Three questions guide the analysis:

1. what are the major marketing channels for GI rice in Kerala and how do they differ in structure?
2. How do marketing cost, margin distribution, price spread, producer's share, and efficiency vary across these channels?
3. what constraints do stakeholders face in the marketing system?

Based on the evidence reviewed above, efficiency is expected to decline as channel length increases and producer's share to

be higher in direct and short channels, with variety specific quality attributes playing a smaller role than channel structure itself, expectations examined descriptively in the results rather than through formal statistical hypothesis testing.

2. Methodology

2.1 Data and Sampling

Primary data were collected from 55 stakeholders across the GI rice value chain, comprising 19 farmers, 4 cooperatives, 3 millers, 7 wholesalers, and 22 retailers, spanning six varieties: Palakkadan Matta, Pokkali, Kaipad, Navara, Wayanadan Jeerakashala, and Wayanadan Gandhakashala. A combination of convenience and purposive sampling was used, convenience to ensure accessibility within major producing regions, purposive to deliberately capture each functional role in the chain. Data covered transaction prices, cost components, marketing practices, and constraints; all computations were performed in R 4.2.1 software.

2.2 Analytical Framework

The framework operates at two levels. At the intermediary level, cost, gross margin, and net margin were estimated for each actor. At the channel level, these were aggregated into total marketing cost, total margin, price spread, producer's share, and efficiency, allowing both granular and system-wide comparison across varieties and channels (Kaplinsky and Morris, 2001)^[6].

2.3 Channel Identification

Marketing channels were derived from observed transaction patterns, standardized through frequency analysis and cross-tabulation across varieties. This produced nine configurations, direct, short, niche, processing-based, medium, long, and institutional, though each variety used only a subset of these in practice.

2.4 Cost and Margin Estimation

Marketing cost was defined as the sum of variable expenses incurred in moving product between stages (transportation, storage, processing, packaging, spoilage, labour):

$$MC = \sum C_i$$

Total marketing cost as the sum of variable expenses incurred in moving product between stages.

$$GM = SP - PP$$

Gross margin as selling price minus purchase price.

$$NM = GM - MC$$

Net margin as gross margin minus marketing cost, computed first at the intermediary level and then aggregated to the channel level.

2.5 Price Spread and Producer's Share

$$\text{Price Spread} = P_c - P_f$$

Price spread as the gap between consumer price and farmer price.

$$\text{PSCR} = (P_f / P_c) \times 100$$

Producer's share in the consumer rupee, following the standard formulation for Indian agricultural marketing studies (Acharya and Agarwal, 2011) ^[1].

2.6 Marketing Efficiency Measures

$$\text{MEs} = P_c / \text{MC}$$

Shepherd's Index, capturing cost efficiency (Shepherd, 1965) ^[13].

$$\text{ME}_a = P_f / (\text{MC} + \text{MM})$$

Acharya's Modified Measure, where MM is total marketing margin, incorporating both cost and margin to reflect the share of value accruing to producers (Acharya and Agarwal, 2011) ^[1].

2.7 Composite Marketing Efficiency Index (CMEI)

Shepherd's Index and Acharya's Measure are retained individually for comparability with prior literature (Shepherd, 1965; Acharya and Agarwal, 2011) ^[1], but the two can rank a channel differently, one reflecting cost efficiency, the other value transmission. The CMEI integrates both into a single normalized measure to resolve this divergence. CMEI was constructed integrating producer's share, price spread, marketing cost, and Shepherd's Index ^[13].

$$Z_i = (X_i - X_{\min}) / (X_{\max} - X_{\min})$$

Min-max normalization of each indicator onto a common (0,1) range (Talukder *et al.* 2017) ^[14].

$$\text{CMEI} = w_1(\text{PSCR}) + w_2(1/\text{Price Spread}) + w_3(1/\text{Cost}) + w_4(\text{MEs})$$

Equally weighted aggregation of the normalized indicators, yielding a continuous, ranked measure of channel performance comparable across all six varieties.

2.8 Assumptions

Farmer price was defined as the first farmgate transaction price, consistent with standard practice for estimating producer's share (Acharya and Agarwal, 2011). Fixed costs, difficult to allocate per unit, were apportioned at 12.5 per cent of total marketing cost, reflecting shared infrastructure use, an approach consistent with conventional marketing cost studies (Shepherd, 1965). Identified channels reflect observed transactions within the sampled regions rather than an exhaustive market census, and reported cost/margin figures are indicative rather than a strict accounting identity, particularly in institutional and niche channels involving administered pricing. Retailers were split into two categories, with Retailer 2 representing eco-shops selling organic/GI products at premium prices ^[1, 13].

2.9 Constraint Analysis

$$\text{Percentage} = (\text{Frequency} / \text{Total Respondents}) \times 100$$

Severity of stakeholder-reported constraints, production, marketing, and institutional, assessed through percentage analysis (Raina *et al.*, 2024; Krishan *et al.*, 2026) ^[7, 12].

3. Results

3.1 Channel Structure Across Varieties

Nine channel types were defined from observed transaction patterns (Table 1 and Fig. 1), but each variety draws on only a subset of these in practice. The matrix (Fig. 2) visualizes this directly: Kaipad is the only variety with an active institutional cooperative pathway (C7), while Palakkadan Matta is the only variety lacking a simple short retailer channel (C2), moving instead straight to niche eco-shop or processing-based routes. The remaining four varieties share an identical six-channel footprint (C1-C6), suggesting a common regional marketing infrastructure for Kerala's aromatic and coastal rice varieties, distinct from Palakkadan Matta's more processing-centric system and Kaipad's more institutionally layered one.

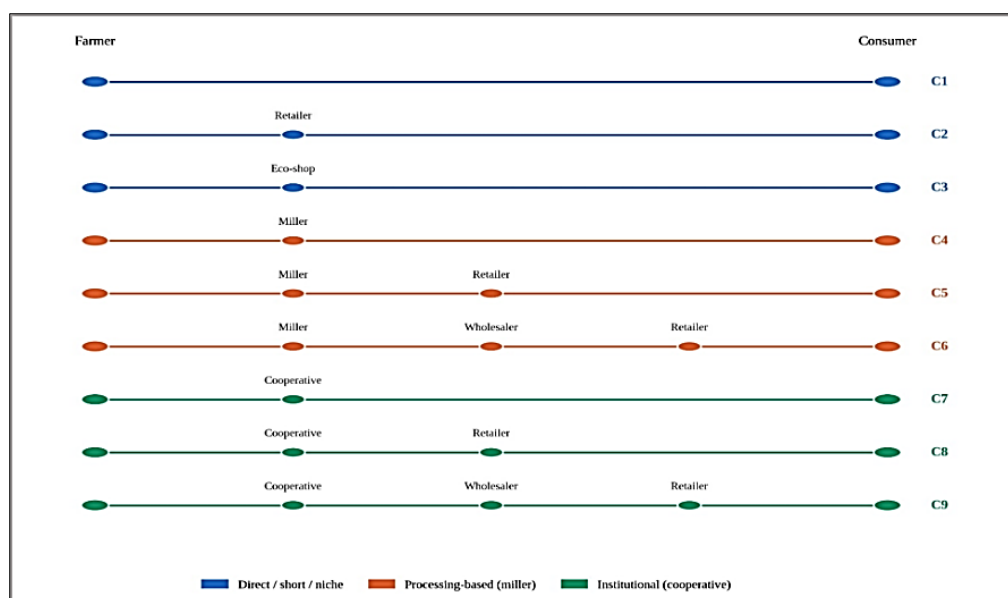
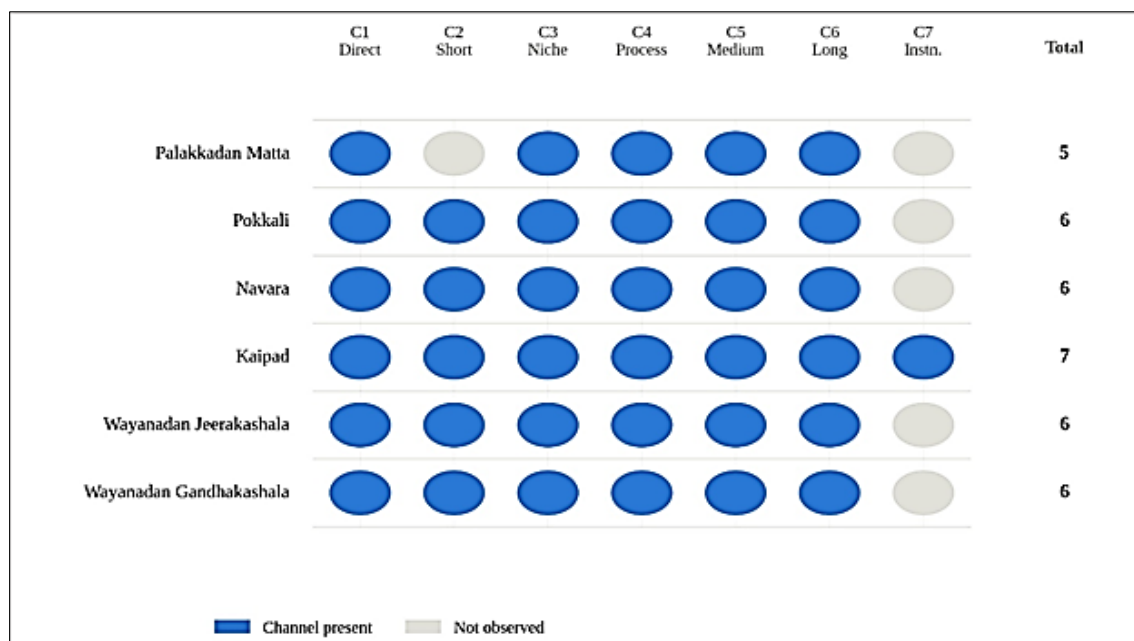


Fig 1: Configuration of marketing channels for GI rice in Kerala

Table 1: Identified Marketing Channels

Code	Structure	Type
C1	Farmer → Consumer	Direct
C2	Farmer → Retailer → Consumer	Short
C3	Farmer → Eco-shop Retailer → Consumer	Niche
C4	Farmer → Miller → Consumer	Processing-based
C5	Farmer → Miller → Retailer → Consumer	Medium
C6	Farmer → Miller → Wholesaler → Retailer → Consumer	Long
C7	Farmer → Cooperative → Consumer	Institutional
C8	Farmer → Cooperative → Retailer → Consumer	Institutional-extended
C9	Farmer → Cooperative → Wholesaler → Retailer → Consumer	Institutional-long

**Fig 2:** Availability of marketing channels by GI rice variety

3.2 Palakkadan Matta Rice

Table 2: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	55	55	26.20	0	0	100.00	2.10	2.10
C2*	28.32	-	23.71	-	-	-	-	-
C3	100	120	45.44	20	20	83.33	2.64	1.53
C4	26	42	26.00	16	16	61.90	1.62	0.62
C5	26	75	37.00	49	49	34.67	2.03	0.30
C6	26	75	44.50	49	49	34.67	1.69	0.28

*C2 is a structurally distinct welfare/procurement-based channel and is excluded from efficiency comparison

The direct channel (C1) retains the full consumer price at moderate cost (₹26.20), while C3, an intermediary channel, sustains a high 83.33 per cent producer's share alongside the highest Shepherd's Index in the set (2.64), indicating that value transmission and cost efficiency can coexist when the intermediary structure remains simple. C4 shows a lower marketing cost than C3 but a markedly weaker producer's

share (61.90 per cent), while C5 and C6 converge on an identical, sharply reduced producer's share of 34.67 per cent despite different cost levels, indicating that beyond a certain point additional marketing cost stops correlating with any offsetting gain in farmer returns (Acharya and Agarwal, 2011) ^[1].

Table 3: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	0.990	0.471	0.865
C3	0.745	0.592	0.000	1.000	0.584
C4	0.417	0.673	1.000	0.000	0.523
C5	0.000	0.000	0.435	0.402	0.209
C6	0.000	0.000	0.048	0.069	0.029

C1 leads the ranking at 0.865, and C3 follows at 0.584 despite bearing the highest absolute cost among all channels, confirming that its strong value transmission fully compensates for weaker cost efficiency. C6 falls to 0.029, the lowest non-welfare channel recorded for this variety, driven by the combined effect of low producer's share, high cost, and

a comparatively weak Shepherd's Index, illustrating the cumulative inefficiency that follows from extended intermediation (Talukder *et al.*, 2017)^[14].

3.3 Pokkali Rice

Table 4: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	110	110	76.50	0	0	100.00	1.44	1.44
C4	80	120	84.30	40	40	66.67	1.42	0.64
C5	80	160	95.50	70	80	50.00	1.68	0.48
C6	80	185	120.15	105	105	43.24	1.54	0.36
C7	65	140	104.88	75	75	46.43	1.33	0.36
C8	65	180	119.28	115	115	36.11	1.51	0.28

Pokkali records the highest direct-channel marketing cost of any variety (₹76.50), consistent with the added logistics of saline-tract cultivation. C4 sustains the strongest intermediary producer's share (66.67 per cent) at a comparatively moderate cost, while C6 carries the highest

absolute marketing cost in the set (₹120.15) without a corresponding improvement in farmer returns. C7 and C8 both draw on a lower farmer price base (₹65) than C4-C6, indicating a separate, lower-value transaction tier within this variety's marketing system.

Table 5: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	1.000	0.341	0.829
C4	0.478	0.652	0.821	0.257	0.552
C5	0.217	0.304	0.565	1.000	0.522
C6	0.111	0.087	0.000	0.600	0.200
C7	0.162	0.348	0.350	0.000	0.215
C8	0.000	0.000	0.020	0.514	0.134

Despite its elevated direct-channel cost, C1 still records a CMEI of 0.829, reinforcing that composite efficiency is dominated by value transmission rather than absolute cost (Acharya and Agarwal, 2011)^[1]. C4 leads the intermediary channels (0.552), narrowly ahead of C5 (0.522), which compensates for a lower producer's share with the highest

Shepherd's Index in the set (1.68). C8 records the lowest CMEI (0.134), driven by the lowest producer's share (36.11 per cent) and the highest price spread (₹115) observed for this variety.

3.4 Navara Rice

Table 6: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	180	180	90.44	0	0	100.00	1.99	1.99
C2	80	200	108.75	120	120	40.00	1.84	0.35
C3	200	250	131.63	50	50	80.00	1.90	1.10
C7	110	330	106.53	220	220	33.33	3.10	0.34
C8	110	350	129.93	240	240	31.43	2.69	0.30
C9	110	360	152.33	250	250	30.56	2.36	0.27

Navara commands the highest consumer prices recorded in the study, reaching ₹360 in C9 against a farmer price of only ₹110, the widest absolute spread of any variety. C3 shows a balanced structure, combining a high producer's share (80 per cent) with a comparatively controlled price spread (₹50). C7 is the study's clearest case of a cost-value divergence: its

Shepherd's Index (3.10) is the highest recorded across all 37 channel observations, yet its Acharya's Measure (0.34) is among the lowest, exposing the precise tension the composite index is designed to resolve (Shepherd, 1965; Dey and Singh, 2025)^[4, 13].

Table 7: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	1.000	0.119	0.780
C2	0.136	0.520	0.704	0.000	0.340
C3	0.712	0.800	0.334	0.048	0.473
C7	0.040	0.120	0.740	1.000	0.475
C8	0.013	0.040	0.362	0.675	0.272
C9	0.000	0.000	0.000	0.413	0.103

C7's exceptional cost efficiency lifts its CMEI to 0.475, narrowly ahead of C3 (0.473), the only instance across the entire study where a channel with weak producer's share outranks a value-transmission-led channel. This near-tie illustrates why Shepherd's Index and Acharya's Measure are

retained individually alongside CMEI: neither alone would reveal how closely two structurally different channels can perform once both dimensions are weighed together.

3.5 Kaipad Rice

Table 8: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	100	100	63.78	0	0	100.00	1.57	1.57
C4	24	80	54.05	56	56	30.00	1.48	0.22
C5	24	120	65.45	96	96	20.00	1.83	0.15
C6	24	130	79.85	106	106	18.46	1.63	0.13
C7	30	120	77.00	90	90	25.00	1.56	0.18
C8	30	130	89.80	100	100	23.08	1.45	0.16
C9	30	140	114.60	110	110	21.43	1.22	0.13

Kaipad shows the lowest sustained farmer price of any variety outside its direct channel, falling to ₹24 across C4-C6, less than a quarter of the ₹100 achieved through direct sale. Producer's share remains persistently low across every intermediary channel (18-30 per cent), and C9 combines the

highest marketing cost in the set (₹114.60) with the lowest Shepherd's Index (1.22), indicating this channel is structurally the least efficient pathway available to Kaipad farmers.

Table 9: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	0.848	0.574	0.855
C4	0.141	0.491	1.000	0.426	0.515
C5	0.019	0.127	0.812	1.000	0.490
C6	0.000	0.036	0.574	0.672	0.321
C7	0.080	0.182	0.620	0.557	0.360
C8	0.057	0.091	0.409	0.377	0.233
C9	0.037	0.000	0.000	0.000	0.009

C9's CMEI of 0.009 is the lowest recorded anywhere in the study, confirming numerically that low producer's share cannot be offset by any other component once cost and Shepherd's Index also collapse simultaneously. C5's relatively strong Shepherd's Index (1.83, the highest among Kaipad's intermediary channels) fails to lift its CMEI above

0.490, reinforcing that for this variety, weak value transmission is the dominant constraint rather than cost inefficiency (Radhika *et al.* 2021)^[10].

3.6 Wayanadan Jeerakashala Rice

Table 10: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	140	140	73.13	66.87	0	100.00	1.91	1.91
C2	140	180	85.73	54.27	40	77.78	2.10	1.11
C3	180	220	96.18	63.82	40	81.82	2.29	1.32
C7	60	170	93.60	76.40	110	35.29	1.82	0.29
C8	60	180	106.40	73.60	120	33.33	1.69	0.27
C9	60	175	113.00	62.00	115	34.29	1.55	0.26

C2 and C3 both sustain farmer prices at or above the direct-channel level (₹140-180), an outcome not observed in any other variety, where intermediaries add margin from the consumer side rather than depressing what farmers receive.

This breaks sharply at C7, where farmer price drops to ₹60, less than half of C1-C3, marking a clear divide between this variety's premium-aligned channels and its lower-value channels.

Table 11: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	1.000	0.486	0.872
C2	0.667	0.667	0.684	0.743	0.690
C3	0.728	0.667	0.422	1.000	0.704
C7	0.030	0.083	0.486	0.365	0.241
C8	0.000	0.000	0.166	0.189	0.089
C9	0.014	0.042	0.000	0.000	0.014

This structural divide is captured cleanly in the CMEI, which clusters C1-C3 tightly between 0.690 and 0.872 before falling sharply to 0.241 at C7 and to near-zero by C9, a threshold effect rather than a gradual decline (Naik and Mohan, 2026) [9]. Unlike the Navara case, Shepherd's Index, Acharya's

Measure, and CMEI all agree on the ranking of C2 and C3 here, reinforcing rather than complicating the composite result.

3.7 Wayanadan Gandhakashala Rice

Table 12: Comprehensive Marketing Analysis

Channel	FP (₹)	CP (₹)	Cost (₹)	Margin (₹)	Spread (₹)	PSCR (%)	Shepherd's	Acharya's
C1	150	150	73.13	0	0	100.00	2.05	2.05
C2	150	210	94.73	60	60	71.43	2.22	0.97
C3	180	220	96.18	40	40	81.82	2.29	1.32
C7	60	170	93.60	110	110	35.29	1.82	0.29
C8	60	200	114.40	140	140	30.00	1.75	0.24
C9	60	220	138.60	165	160	27.27	1.59	0.20

C2's farmer price (₹150) matches C1 exactly, meaning the entire retailer margin in this channel is absorbed from the consumer side, the most favourable short-channel outcome recorded for any variety. Marketing cost then climbs steadily

from ₹73.13 in C1 to ₹138.60 in C9 while farmer price falls to ₹60, producing the widest price spread among this variety's channels (₹160).

Table 13: Composite Marketing Efficiency Index

Channel	Z(PSCR)	Z(Spread)	Z(Cost)	Z(Shepherd's)	CMEI
C1	1.000	1.000	1.000	0.657	0.914
C2	0.608	0.625	0.670	0.900	0.701
C3	0.751	0.750	0.648	1.000	0.787
C7	0.110	0.313	0.689	0.329	0.360
C8	0.038	0.125	0.371	0.229	0.191
C9	0.000	0.000	0.000	0.000	0.000

Gandhakashala records both the highest direct-channel CMEI (0.914) and the highest CMEI among intermediary channels (C3, 0.787) of any variety in the study, while C9 is the only channel across all 37 observations to reach a CMEI of exactly zero, positioning this variety as the clearest single illustration of the study's central finding (Bhagat and Pathak, 2025) [3].

Fig. 3 summarises the channel-wise composite efficiency results by contrasting the direct channel (C1) of each variety against the arithmetic mean of all its intermediary channels. The direct channel returned the highest CMEI for every variety without exception, ranging from 0.780 for Navara to 0.914 for Wayanadan Gandhakashala, while the corresponding intermediary means clustered narrowly

between 0.321 and 0.408. The resulting shortfall in composite efficiency was remarkably consistent, varying only between 55.4 per cent for Wayanadan Gandhakashala and 62.4 per cent for Kaipad, despite the six varieties differing widely in agro-ecology, scale of cultivation and channel architecture. This uniformity indicates that the efficiency deficit is structural rather than variety-specific, arising from the act of intermediation itself rather than from the particular attributes of any single production system. It is reflected most directly in producer's share, which falls from 100 per cent under direct sale to a variety-wise mean of 23.0 to 53.6 per cent once intermediaries enter the chain, with Kaipad rice recording the sharpest erosion.



Fig 3: Direct versus mean intermediary composite marketing efficiency by GI rice variety, with the resulting efficiency loss

3.8 Constraints in GI Rice Marketing

Table 14: Stakeholder-Reported Constraints

Constraint	Frequency	Share (%)
Others (labour shortage, climate variability, pest/bird damage, harvest loss)	36	30.5
High transportation and storage cost	22	18.6
Limited consumer awareness	18	15.3
Price fluctuation	10	8.5
Delay in payment	9	7.6
Aggregation difficulty	8	6.8
Competition from non-GI rice	7	5.9
Demand-supply mismatch	7	5.9
Certification cost	1	0.8
Lack of premium for GI rice	0	0.0

Production-adjacent and logistical constraints dominate over regulatory burden: certification cost was cited by under 1 per cent of respondents, directly contradicting the common policy assumption that certification expense limits GI marketing effectiveness. The real bottlenecks lie in labour and climate exposure upstream, and in transport, storage, and consumer awareness downstream (Naik and Mohan, 2026)^[9].

4. Discussion: The findings are discussed below in relation to channel structure, the determinants of marketing performance, and the constraints shaping the system, before being synthesized in relation to the broader question of whether Geographical Indication status has translated into equitable value distribution for Kerala's rice producers.

4.1 Channel Structure and Diversity

The channel configurations identified across the six varieties are not drawn from a single, uniform numbering sequence; Palakkadan Matta operates through C1 and C3-C6, Pokkali through C1 and C4-C8, Navara through C1-C3 and C7-C9, Kaipad through C1 and C4-C9, and both Wayanadan varieties through C1-C3 and C7-C9. This variation itself is informative: it indicates that the marketing pathways available to each variety are shaped by locally specific actor configurations rather than a standardized system imposed uniformly across Kerala's GI rice basket, consistent with Kaplinsky and Morris's (2001)^[6] contention that channel structure in agricultural systems reflects commodity- and context-specific cost and actor arrangements rather than a universal template. This extends the institutional account offered by Radhika *et al.* (2021)^[10], who found that registered proprietor bodies had initiated participatory marketing processes for only one of Kerala's six rice GIs, by showing, at the transaction level, that this institutional unevenness corresponds to genuinely different channel architectures rather than a common structure applied inconsistently.

A related assessment by Radhika *et al.* (2018)^[11] similarly found that financial returns from GI registration varied sharply by variety, highest for Navara and lowest for Pokkali, a divergence consistent with the variety-specific cost and margin differences documented here. This pattern is not confined to Kerala: Thirumarudhan *et al.* (2025)^[15] report that India's GI registration volume has grown at a compound annual rate of 5.76 per cent since 2004, consistently outpacing the institutional and marketing support required to operationalize newly registered products.

4.2 Determinants of Marketing Performance

Across all six varieties, marketing cost and price spread rise while producer's share and composite efficiency fall as channels lengthen, regardless of how individual channels happen to be numbered within each variety's system. The pooled correlation between producer's share and CMEI ($r = 0.86$) indicates that value distribution, rather than transaction cost ($r = -0.45$), is the dominant determinant of composite performance, a distinction Shepherd's (1965)^[13] cost-based index alone cannot capture but which the Acharya and Agarwal (2011)^[1] framework, and the composite index derived from it, is designed to address.

This channel-length effect recurs across commodities well beyond GI rice. Raina *et al.* (2024)^[12] report that direct potato marketing in Kangra achieved more than double the efficiency of a four-intermediary channel, Kumar *et al.* (2022) find an analogous pattern for black gram in Tamil Nadu, and Dey and Singh (2025)^[4, 8] similarly find channel choice, more than production cost, to be the binding determinant of farm income among paddy growers in eastern India. The closest parallel is provided by Bhagat and Pathak (2025)^[3], who report that Jeeraphool rice farmers in Chhattisgarh retained the full consumer price only through direct sale, with their share falling below half once trader-based channels were used, a structural pattern that closely mirrors the direct-channel premium documented here.

A more nuanced result emerges from Navara's channel C7, where an exceptionally high Shepherd's Index (3.10), the highest recorded across all 33 channel observations in this study, partially offset a comparatively weak producer's share (33.33 per cent), lifting its CMEI narrowly above the value-transmission-led channel C3. This is the single instance in the dataset where cost efficiency and value transmission diverge sharply enough to reverse an otherwise expected ranking, and it underscores the necessity of composite measurement of the kind advanced by Talukder *et al.* (2017)^[14]: a researcher relying on Shepherd's Index alone would rank C7 as the strongest channel in Navara's entire system, while Acharya's Measure alone would rank it among the weakest.

4.3 Structural versus Institutional Constraints

Production-adjacent and logistical constraints, labour shortage, climate variability, and transport and storage costs, together account for approximately half of all reported constraints, whereas certification cost, frequently assumed to be a primary friction point in GI marketing, was cited by fewer than one per cent of respondents. This finding qualifies

the assumption, embedded in much of the GI public-goods literature, that value-capture failures are primarily institutional or legal in nature.

Belletti *et al.* (2017)^[2] argue that GI value capture depends on the interaction between valorization strategy and public policy, while Vandecastelaere *et al.* (2009)^[16] similarly emphasize institutional facilitation as a precondition for GI success; the present evidence suggests that in Kerala's case, the binding constraint lies further upstream, in production reliability, and downstream, in logistics, rather than within the GI governance apparatus itself. Kaipad illustrates this concretely: its most heavily intermediated channel (C9) records the lowest CMEI in the entire study (0.009), driven by the simultaneous collapse of producer's share, cost efficiency, and Shepherd's Index together, rather than by any single institutional failure. This is corroborated by national-scale evidence from Naik and Mohan (2026)^[9], who find that farmers' channel choice for paddy is shaped considerably more by access to market information and technical advice than by certification or registration factors, suggesting that the constraint pattern observed here reflects a broader structural feature of Indian smallholder rice marketing rather than a symptom specific to GI-tagged produce.

Considered together, these findings indicate that GI status in Kerala's rice sector has not, by itself, altered either the structure of marketing channels or the constraints stakeholders face within them, and has consequently not guaranteed that the price premium associated with GI recognition reaches producers. This stands in contrast to Jena and Grote's (2012)^[5] finding for Basmati rice in Uttarakhand, where GI-like protection was associated with measurable welfare gains, an outcome that appears to have depended on marketing conditions not yet replicated for Kerala's rice GIs. The consistent 55-62 per cent CMEI loss between the direct channel and the average intermediary channel across all six varieties suggests that the mechanism constraining producer benefit is structural and channel-based rather than product- or policy-specific, pointing toward channel-level intervention, rather than further certification activity, as the more direct policy lever available for improving outcomes among Kerala's GI rice producers.

5. Conclusion

This study set out to examine whether Geographical Indication status has translated into equitable marketing outcomes for Kerala's six GI-tagged rice varieties, and to provide a channel-level, multi-variety quantification that the existing literature on Kerala's rice GIs had not yet offered. By constructing a Composite Marketing Efficiency Index that integrates producer's share, price spread, marketing cost, and Shepherd's Index into a single normalized measure, the study demonstrates that marketing performance across all six varieties is governed overwhelmingly by the degree of intermediation rather than by variety-specific quality attributes, GI status, or absolute marketing cost. The consistent 55-62 per cent CMEI loss between direct and intermediary channels, and the collapse of both Kaipad's C9 channel (CMEI 0.009) and Gandhakashala's most extended channel (CMEI 0.000), represent the clearest empirical evidence to date that Kerala's rice GIs share a common structural vulnerability, one that institutional assessments such as Radhika *et al.* (2021)^[10] had identified qualitatively but not previously quantified at the transaction level.

6. Policy Implications

Three implications follow directly from the results rather than from general GI policy discourse. First, since certification cost was cited by fewer than one per cent of respondents as a constraint, policy resources currently directed at reducing certification burden would be better redirected toward the production-side and logistical constraints, labour availability, climate resilience, and transport and storage infrastructure, that together account for roughly half of all reported constraints, a reallocation consistent with the market-access findings of Naik and Mohan (2026)^[9] for paddy nationally. Second, the collapse of Kaipad's most intermediated channel to the lowest CMEI recorded in the entire study indicates that longer institutional or multi-actor pathways cannot be assumed to protect producer interests by default; strengthening these pathways would require the kind of active participatory engagement that Radhika *et al.* (2021)^[10] found largely absent among Kerala's GI proprietor bodies, rather than the mere presence of an additional intermediary. Third, given that direct and short channels consistently outperform longer ones across every variety, and that Wayanadan Jeerakashala and Gandhakashala both show farmer prices in short channels matching or exceeding the direct-channel level, targeted investment in farmer-facing retail infrastructure, eco-shop linkages, local farmers' markets, and digital direct-sale platforms, would likely yield larger producer welfare gains than continued expansion of GI registration itself, echoing the broader caution raised by Belletti *et al.* (2017)^[2] that GI protection alone does not guarantee value capture without complementary market-facing investment.

7. Limitations of the study

The findings should be read alongside several limitations. The sample of 55 stakeholders, while purposively structured to represent each functional role in the chain, is modest relative to the six-variety, multi-channel scope of the analysis, and some variety-channel cells rest on a small number of transactions. Reported cost and margin figures are indicative rather than a strict accounting identity, particularly in institutional and niche channels involving administered pricing, as noted in Section 2. The CMEI's equal weighting scheme, while transparent and consistent with common practice (Talukder *et al.*, 2017)^[14], is one of several defensible weighting choices, and sensitivity to alternative weights was not tested here. Finally, the cross-sectional design captures channel performance at a single point in time and cannot speak to how efficiency has evolved since each variety's GI registration.

8. Future Research

Three extensions would strengthen this line of inquiry. Longitudinal tracking of CMEI before and after specific market interventions, such as eco-shop expansion or cooperative restructuring, would allow causal claims that the present cross-sectional design cannot support. Sensitivity analysis using alternative normalization and weighting schemes, following the methodological comparisons demonstrated by Talukder *et al.* (2017)^[14], would test the robustness of the variety rankings reported here. Finally, extending the composite index framework applied in this study to other Indian GI food-grain products, building on the

precedent set by single-variety studies such as Bhagat and Pathak (2025)^[3] for Jeeraphool rice, would test whether the structural pattern identified here for Kerala is a general feature of India's GI food-grain economy or specific to its institutional context.

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