Assessing Marketing Efficiency in the Coconut Value Chain: A Case Study of Western Tamil Nadu's Coconut Landscape

ABSTRACT

India, the world's leading producer of coconuts, also faces challenges in optimizing farmer returns within its coconut value chain. This study investigates the marketing efficiency of Coconut value chain in Western Tamil Nadu, a significant contributor to national production. A multi-stage random sampling technique was employed to collect data from 300 coconut farmers, intermediaries (commission agents, harvest contractors), processors, wholesalers, retailers, and consumers across four districts (Coimbatore, Tirupur, Erode, and Namakkal). Marketing efficiency was assessed using Shepherd's method, Acharya's modified approach (incorporating post-harvest losses), and Calkin's index.Three marketing channels were identified: (i) Through Harvest Contractors (CVC I), (ii) Through Commission Agents (CVC II), and (iii) Through Farmer Producer Companies (FPCs) (CVC III). This article delves into the factors contributing to these results, explores the existing literature on coconut marketing efficiency, and proposes FPCs as a key strategy for enhancing farmer livelihoods in the region.The findings highlight the dominance of FPCs (CVC III) as the most efficient marketing channel across all districts, followed by CVC I (through harvest contractors) in most cases.

Keywords: *Coconut, marketing efficiency, value chain, farmer producer companies (FPCs)*

1.INTRODUCTION

India's agriculture sector, including horticulture, accounted for 50.00 percent of the total employment with a total production of 655.03 million tons in 2022-23(IBEF 2023). The horticulture sector contributed to 33 percent of total agriculture output (PIB 2023). Horticultural production has raised about 30 percent in the last five years (MOSPI 2023), with the total production of 341.63 metric tons, and the total area had marginally increased to 25.87 million hectares in 2022-23. India, endowed with rich coconut biodiversity, claims the title of the largest producer, contributing a hefty 33.02 percent to the world's coconut production, totaling a staggering 22167 million nuts. Leading the charge is Kerala, with a production of 7.63 billion nuts (35.69 percent) from 7.56 lakh hectares (34.74 percent). Karnataka follows suit, boasting 6.15 lakh hectares and clinching third place in production with 23.96 percent (5.123 billion nuts) (CDB, 2023)

Many factors have been cited as reasons for inefficient value chain framework, and the primary reason includes the presence of a large number of intermediaries, lack of technical know-how in coconut production, poorly organized small-scale producers, and lack of market information among the market actors(Ramakumar 2001). Performance of various channels of the coconut value chain and the factors which influenced and improved the profit resulted in providing an efficient and effective value chain of coconut is explained. There are also issues such as weak institutional arrangement, lack of coordination among the farmers to plan and organize the production and marketing by reducing the number and length of the chain and thus improving the market efficiency. Hence, this study focuses on analysing the market efficiency of coconut value chain in Western Tamil Nadu.

Several studies have explored the concept of marketing efficiency within agricultural value chains. Shepherd introduced a widely used method for measuring marketing efficiency, focusing on the ratio between the value of goods sold and the total marketing cost. However, this method does not account for post-harvest losses, which can significantly impact farmer income (Acharya & Agarwal, 2011). Acharya's modified approach incorporates this crucial factor, providing a more accurate measure of marketing efficiency. Additionally, Calkin's index (Ayoob, 2020) considers the

ratio between the sum of marketing margins and marketing costs, where a lower value indicates higher efficiency.

Studies specific to the coconut value chain in India (e.g., Banu, 2019), concerns about inefficient marketing practices and highlight the need for interventions that empower farmers and reduce marketing costs. Research conducted by Mahendran et al. (2020) in Kerala, another major coconut producing state, suggests that FPCs can play a significant role in improving market access, price realization, and overall marketing efficiency for coconut farmers.

2.METHODOLOGY

Coconut is grown in more than 25 countries worldwide in hectares of land, which constitute about 2.0 percent of the net crop of the world. In India, 33.02 percent of the total production is contributed by the states of Kerala, Tamilnadu, Karnataka, Andhra Pradesh, West Bengal, Maharashtra, Orissa, Assam. The state of Kerala tops in production accounted for 35.69 percent, followed by Tamil Nadu ranks second with 24.84 percent of the total production of the country.A multi-stage random sampling technique was employed to select the sample respondents based on the time and resource constraints of the investigator. In the first stage, among various districts in Tamil Nadu, Coimbatore, Tirupur, Erode and Namakkal were purposively selected based on the area and production of coconut. These districts contributed to 39.26 percent of the area under coconut cultivation in the state. Besides a large number of intermediaries, processing units were also available in these districts.

In the second stage, based on the area under coconut cultivation, three taluks in each district viz., Pollachi, Anaimalai and Kinathukadavu in Coimbatore district, Udumalpet, Dharapuram and Palladam in Tirupur district, Mohanur, ParamathiVelur, Kabilarmalai in Namakkal district were selected and due to wide spread area under coconut in Erode, five taluks viz., Perundurai, Gobichettipalayam, Sathyamangalam, Modakurichi and Kodumudi in Erode district were selected.

In the third stage, two blocks were selected from each taluk based on the highest area under coconut cultivation and farmers were randomly selected from the villages of selected blocks. In Namakkal, due to lesser area under cultivation, only one block was purposively selected. Twenty-five farmers from nine taluks i.e., Coimbatore (3 Taluks), Tirupur (3 Taluks) and Namakkal (3 Taluks) and fifteen farmers from five taluks of Erode district were selected with the total of 300 coconut farmers were selected randomly. The farmers were contacted individually for collection of details on production, marketing, post-production activities, value chain of coconut with the help of a well-structured and pre-tested interview schedule.

Besides the sample farmers, 40 commission agents, 40 harvest contractors, 20 exporters, 20 processors, 40 wholesalers, 40 retailers and 80 consumers involved in the value chain were selected randomly and the details are given in the below table.The data was collected during 2022-23 and it took three months to collect the data.

Table 1:Intermediaries and Consumers

District / Intermediaries	Coimbatore	Tirupur	Erode	Namakkal	Total
Commission agents	10	10	10	10	**40**
Harvest Contractors	10	10	10	10	**40**
Exporter	10	10	0	0	**20**
Farmer Producer Company	1	1	1	1	**4**
Processors	5	5	5	5	**20**
Wholesalers	10	10	10	10	**40**
Retailer	10	10	10	10	**40**
Consumer	20	20	20	20	**80**
Total	**71**	**71**	**71**	**71**	**284**

2.1 TOOLS OF ANALYSIS FOR MARKETING EFFICIENCY

2.1.1. ACHARYA'S METHOD

The conventional methods, Shepherd's method and Acharya's modified formula (Acharya and Agarwal 2011), do not mention the loss in produce during the marketing process as a separate item. However, the reduction due to post-harvest losses is one of the efficiency parameters. Therefore, it is the pivot to incorporate the loss component explicitly in the current marketing ratios to get the correct measures of marketing efficiency while comparing the market channels. The post-harvest loss/marketing loss component was incorporated in the formula given by (Acharya and Agarwal 2011), and the modified marketing efficiency (ME) was measured as

$$ME = \frac{NP_G}{MM + MC + ML}$$

ME = Marketing Efficiency
NP_G =Net price received by the farmers (Rs. /Kg)
MM = Total Marketing Margin of intermediaries
MC = Total Marketing Costs of intermediaries
ML = Total Marketing Loss of intermediaries

2.1.2. SHEPHERD'S FORMULA

The Marketing channel efficiency was calculated with the help of the following formula. The higher the ratio, the higher would be the efficiency and vice-versa. This can be expressed in the following form:

$$EMC = [(V/I)-1]$$

Where,

EMC = Index of efficiency of market channel
V = Value of goods sold
I = Total marketing cost

2.1.3. CALKIN'S INDEX

Calkin's index of marketing efficiency was estimated using the following formula. The lower the value of the index, the higher would be the efficiency.

$$\text{Marketing Efficiency} = 1 + \left\{ \frac{\text{Sum of profit or margin}}{\text{Sum of marketing cost}} \right\}$$

Marketing efficiency is good when the total marketing margin is higher compared to per unit of the marketing cost. The marketing efficiency in the identified value chains of coconut was estimated using Acharya's approach, Shepherd's formula and Calkin's index.

Shepherd's method does not account for the net margin and the net price received by the farmers in assessing the marketing efficiency, whereas Acharya's approach and Calkin's index consider the marketing margin and marketing cost of the intermediaries. Hence more than one method was used to check the accuracy of the efficiency.

3.RESULTS AND DISCUSSION

3.1 Coconut Value Chain in Western Tamil Nadu

The harvested nuts from the farm were sold in different marketing outlets such as harvest contractors, commission agents, exporters and Farmer Producer Companies (Kalidas, 2024). Six chains operated in Western Tamil Nadu; in that three chains are operated for the domestic market, two chains are operated for the processing chain and one chain for the export market. The value chains are illustrated in the below figure.

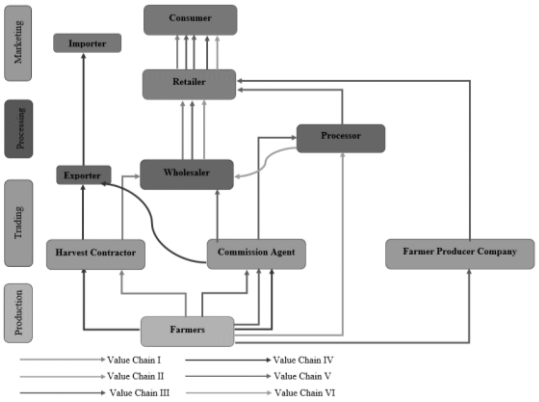

Fig. 1. Value chain analysis

3.1.1. Coimbatore District

Coconut Value Chain (CVC) I comprises of sales via harvest contractor, CVC II is done through commission agent, CVC III consists of sales via farmer producer company, CVC IV is through exporter, CVC V comprises of sales via processor and CVC VI as farmer as primary processor. The results of the marketing efficiency of coconut in Coimbatore district are presented in the Table 2.

Table 2 Marketing Efficiency of Coconut in Coimbatore district

(1000 nuts)

a. Shepherd's method				
S. No.	**Value Chain**	**Value of goods sold (Rs.)**	**Total marketing cost (Rs.)**	**Marketing Efficiency**
1	CVC I	23000	2783	7.26
2	CVC II	23000	2322	8.91
3	CVC III	28000	2296	11.20
4	CVC IV	30000	4091	6.33
5	CVC V	32000	4382	6.30
b. Acharya's method				
S. No.	**Value Chain**	**Price received by the farmer (Rs.)**	**Marketing cost + Marketing margin + Marketing loss (Rs.)**	**Marketing Efficiency**
1	CVC I	15257	7743	1.97
2	CVC II	15758	7242	2.18
3	CVC III	22278	5593	3.98
4	CVC IV	15343	16657	0.92
5	CVC V	16532	13468	1.23
c. Calkin's Index				
S. No.	**Value Chain**	**Sum of profit margin**	**Sum of marketing cost**	**Marketing Efficiency**
1	CVC I	20107	2783	8.22
2	CVC II	20518	4091	6.02
3	CVC III	25574	2322	12.01
4	CVC IV	25729	4382	6.87
5	CVC V	27488	2296	12.97

The results revealed that marketing efficiency was relatively higher in coconut value chain III. As the number of intermediaries was less and the coconut was sold via the farmer producer company, the retailer directly placed the order to the FPC and the same was supplied (demand-based supply). CVC VI is not present in Coimbatore district.

FPC's procured coconuts from the farmers field, the nuts are graded and sorted and sold to the retailer. Large-sized nuts were sold for consumption, and smaller nuts were used for processing by the FPCs. Hence in this chain, both the farmers and consumers were benefitted.

3.1.2.Tirupur District

The results of the marketing efficiency of coconut in Tirupur district are presented in the table 3.

Table 3. Marketing Efficiency of Coconut in Tirupur district

(1000 nuts)

a. Shepherd's method				
S. No.	**Value Chain**	**Value of goods sold (Rs.)**	**Total marketing cost (Rs.)**	**Marketing Efficiency**
1	CVC I	22000	2228	8.88
2	CVC II	23000	2339	8.83
3	CVC III	25000	2215	10.29
4	CVC V	33000	4334	6.61
5	CVC VI	28000	5735	3.88
b. Acharya's method				

S. No.	Value Chain	Net price received by the farmer (Rs.)	Marketing cost + Marketing margin + Marketing loss (Rs.)	Marketing Efficiency
1	CVC I	15027	6973	2.15
2	CVC II	16140	6860	2.35
3	CVC III	19713	5288	3.73
4	CVC V	15321	12679	1.21
5	CVC VI	14477	18523	0.78
c. Calkin's Index				
S. No.	**Value Chain**	**Sum of profit margin**	**Sum of marketing cost**	**Marketing Efficiency**
1	CVC I	19662	2228	9.83
2	CVC II	20501	2339	9.77
3	CVC III	22656	2215	11.23
4	CVC V	22135	5735	4.86
5	CVC VI	28516	4334	7.58

From the above table, it is evident that the marketing efficiency of CVC III was higher in all the methods with a value of 10.29, 3.72 and 11.23 using Acharya, Shepherd's and Calkin's index. CVC III was sustainable and market efficient model followed by CVC I, CVC II, CVC V and CVC VI in Acharya's and Calkin's index, whereas in the Shepherd model CVC III, CVC II, CVC I, CVC VI and CVC V were efficient, this was due to higher net price received by the farmer in those chains. In Tirupur district, CVC IV is not present. Hence it is concluded that when the chain length was reduced, the marketing efficiency was higher and it was profitable for the stakeholders and vice versa.

3.1.3.Erode District

The details of the farmers share in consumer rupee in Erode district are reported in the table below.

Table 4. Marketing Efficiency of Coconut in Erode district

(1000 nuts)

a. Shepherd's method				
S. No.	**Value Chain**	**Value of goods sold (Rs.)**	**Total marketing cost (Rs.)**	**Marketing Efficiency**
1	CVC I	19000	2404	6.90
2	CVC III	21000	2167	8.69
3	CVC V	25000	3804	5.57
b. Acharya's method				
S. No.	**Value Chain**	**Net price received by the farmer (Rs.)**	**Marketing cost + Marketing margin + Marketing loss (Rs.)**	**Marketing Efficiency**
1	CVC I	12160	6840	1.78
2	CVC III	16549	4451	3.72
3	CVC V	13032	11968	1.09
c. Calkin's Index				
S. No.	**Value Chain**	**Sum of profit margin**	**Sum of marketing cost**	**Marketing Efficiency**
1	CVC I	23326	2404	10.70
2	CVC III	23154	2167	11.69
3	CVC V	33015	3804	9.68

*CVC II, IV and VI is not present in Erode district.

It is clear from the above analysis that the marketing efficiency of CVC III (Through FPC) was higher in all the analysis (8.69, 3.72 and 11.69) followed by CVC I (Through HC). Farmer Producer Companies procured the coconuts, graded at their yard, sold the bigger size nuts to the retailer for retail sales and second quality nuts were used for processing coconut oil at their processing centre and followed by CVC I (Through HC), where the farmer received better price due to minimum intermediaries and less marketing margin among the intermediaries. In CVC V (Processor chain),

wherein the marketing cost and marketing margin was higher due to high investment in machineries that resulted in a less efficient value chain.

3.1.4.Namakkal District

The details of the farmers share in consumer rupee in Namakkal district are reported in the table 5.

Table 5. Marketing Efficiency of Coconut in Namakkal district

(1000 nuts)

a. Shepherd's method				
S. No.	**Value Chain**	**Value of goods sold (Rs.)**	**Total marketing cost (Rs.)**	**Marketing efficiency**
1	CVC I	19000	2404	6.90
2	CVC III	22000	2196	9.02
3	CVC V	23000	3759	5.12
b. Acharya's method				
S. No.	**Value Chain**	**Net price received by the farmer (Rs.)**	**Marketing cost + Marketing margin + Marketing Loss (Rs.)**	**Marketing efficiency**
1	CVC I	12160	6840	1.78
2	CVC III	17416	4584	3.80
3	CVC V	11731	11269	1.04
c. Calkin's Index				
S. No.	**Value Chain**	**Sum of profit margin**	**Sum of marketing cost**	**Marketing Efficiency**
1	CVC I	16486	2404	7.86
2	CVC III	19674	2196	9.96
3	CVC V	19091	3759	6.08

*CVC II, IV and VI is not present in Erode district.

From the above table, it could be observed that the marketing efficiency of CVC III was higher with the maximum value (9.02, 3.80 and 9.96) followed by CVC I (through HC) and CVC III (through Processor). The marketing efficiency of CVC III was higher because of the selling through FPC's. FPC's helped in getting a better price for farmers and providing good quality products to the consumers. Harvest contractor has provided services like harvesting, dehusking, transporting, loading/unloading, which helped the farmers to get better service and better price.

The marketing efficiency of Western Tamil Nadu was analyzed using Shepherd's method, Acharya's method and Calkin's Index. Among the various coconut value chains in Western Tamil Nadu, it was found that value chain III was the most efficient chain in all the districts. Coconut Value Chain III (Through FPC) changed the marketing scenario by providing better market price for the farmers in institutional marketing. Followed by CVC I (Through Harvest Contractors) in Tirupur, Erode and Namakkal district. However, in the case of Coimbatore district, CVC II (Through Commission Agents) was better with higher efficiency. The least efficient chain in Western Tamil Nadu was CVC V. This was due to lower farmers share in consumer rupee.

4.CONCLUSION

The main objective of the study was to understand the marketing efficiency of coconut value chain in Western Tamil Nadu. Among all the existing value chain in the study area, the study concluded that, promote the formation and operation of FPCs in the coconut sector to improve market access and farmer income, encourage collaboration between farmers, processors, and retailers to reduce marketing margins and improve value chain efficiency, implement policies to reduce post-harvest losses, which can significantly impact farmer income.

LIMITATIONS

The study focused on four districts in Tamil Nadu and may not be generalizable to other coconut-growing regions in India. Further research could explore the factors influencing FPC success and identify best practices for wider adoption.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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