



Maximizing Marketing Efficiency: A Deep Dive Analysis into Castor crop in Namakkal District, Tamil Nadu, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Castor is a vital industrial oilseed crop with a range of uses that have increased its global economic importance. The research study was conducted using primary data collected through personal interview using well-structured and pre-tested interview schedules with 125 castor farmers and 50 intermediaries were selected purposively random sampling method. The study revealed that marketing of castor, small farmers often sell to local traders due to transportation costs, while larger farmers transport directly to market for higher prices. Main markets for castor are Namakkal, Tiruchengode and Paramathi. The most efficient marketing channel for castor was found to be Producer, Village Trader and Processor i.e. Channel I followed by Producer, Wholesaler and Processor i.e. Channel II and subsequently, Producer and Processor i.e. Channel III. Major

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constraints identified include pests, labour shortages, monsoons failure, high input & labour costs and lack of market information. Fruitful suggestions to improve the marketing efficiency of agricultural commodities like castor, it is important to consider the benefits of value addition reaching farmers and customers. Dealing with insect pests is crucial, so farmers need access to resistant cultivars and pest management methods. Weather-based crop insurance can protect against production risks. The castor industry is hindered by a lack of infrastructure, so improvements in processing, value addition, grading, packaging, storage, and market infrastructure are necessary. Encouraging farmers to add value to castor could be a profitable strategy.

Keywords: Castor; marketing efficiency; price spread; village trader; wholesaler; constraints.

1. INTRODUCTION

Castor is an important industrial non-edible oil seed crop. It is best suited for dry land farming and may thrive in low fertility and rainfall environments. With 19.0% of the world's total oilseed acreage and 10.0% of the world's oilseed production, India is known as an oilseed crop paradise. India is second in the world for oilseed production and is the fourth-largest producer in terms of output [1]. With the introduction of the first hybrid GCH-3 in 1976, India is the only nation in the world to have commercially utilized hybrid technology. Numerous high-yielding hybrids that were resistant to numerous biotic challenges came after this. Landoni, M., et. al., [2].

Castor is largely produced in India, China, Brazil, Russia, Ethiopia, and the Philippines, which together account for 88% of global production. Due to its substantial economic contribution to the nation in the form of foreign exchange, the Indian castor crop has gained importance in recent years. Castor oil is the main commodity in the market, making up around 80% of the entire Castor trade in terms of both quantity and value, including both oil and beans (<https://agricoop.nic.in/> accessed on 27.01.2023). After pepper, castor oil is the second commodity to enter the international commodities market and the fourth one to be allowed for future trading. There is now a global supply and demand balance for castor oil. The top three countries that use castor seed are China, the EU, and Brazil. India holds a 70% global share of castor oil exports, making it the largest exporter, followed by China and Brazil. Kumar, R. M., & Boraiah, B., [3].

As the world's largest producer of castor, India accounts for almost 85% of worldwide output and dominates international trade with a share of about 9%. Approximately 10 lakh tones of castor seed and 5.5 lakh tones of castor oil are

produced in India. P. Murugan and Akila, N., [4]. The Namakkal district's 1300 hectares of castor growing fields were primarily irrigated and rainfed [5]. In Tamil Nadu, the districts of Namakkal, Krishnagiri, Dharmapuri and Salem have played a significant role in increasing the acreage and output of castor, which is mostly produced as an intercrop and border crop in rainfed conditions, major seasons for Castor cultivation are June-July and November-December. The productivity of Castor hybrid as pure crop under rainfed ecosystem is 1800 kg/ha and 3000 kg/ha as pure crop under irrigated ecosystem.

During 2022-2023, Tamil Nadu's castor production reached a total of 1813 tonnes, covering an area of 5814 hectares. With 541 tonnes, Namakkal district emerged as the leading producer of castor with 1735 hectares area dedicated to castor cultivation. Following closely behind is Krishnagiri, with 1086 hectares area under cultivation in 2022-23. Namakkal district, which contributes 28% (1593 hectares) of land area and 26.97% (481 tons) of castor production during a five-year average ending in 2022–2023 is the largest district in Tamil Nadu in terms of both area and production (Season and Crop report, Tamil Nadu 2022-2023).

In Namakkal district, castor is cultivated in high-risk locations where investment returns are erratic. When it comes to castor farming, prioritizing price, production, and marketing risk management has not gotten enough attention in the past. This scenario needs to be changed. More people are becoming aware of the necessity of efficient resource management in crop production and marketing if stakeholders are to continue growing castor crops. In order to do this, the Namakkal district must identify barriers to the production and selling of castors and enhance marketing effectiveness. More land has to be switched from growing crops to castor farming in order to help create jobs and more cash in this study area, as there is still a

substantial gap between the supply and demand for castor. Considering the aforementioned aspects of Castor's marketing efficiency and constraints analysis, the current study will be conducted with the following specific objectives:

- (i) to identify the major distribution channels involved in the marketing Castor.
- (ii) to study price spread and marketing efficiency of Castor
- (iii) to identify the constraints in production and marketing of Castor and suggests suitable policy measures to overcome the constraints.

The results of the study will be useful to farmers, input agencies, and policy makers who are interested in encouraging castor cultivation in Namakkal district in developing policies and strategies to boost castor production.

2. METHODOLOGY

Namakkal district in Tamil Nadu was purposefully chosen as the focus of this study based on largest area and production of castor cultivation and taking into consideration of time and resource availability to the researcher. Castor farmers of Namakkal district was the universe of study. In Namakkal district three blocks were selected based on largest area and production of Castor. In each block five villages were selected at randomly and each village five farmers were selected randomly total farmers was 75. Total sample size consists of 125 and 50 intermediaries were selected randomly based on largest volume of transaction. The primary data were collected from the sample respondents during the months of March-April, 2023 and the data collected were relating to the agriculture year of 2022-23. Primary data was used for this study. The data collection was carried out through personal interview using well-structured and pre-tested interview schedules. Three separate sets of interview schedules were prepared to collect details from farmers and market intermediaries. The data collected were tabulated, processed and subjected to statistical analysis.

2.1 Tools of Analysis

The following tools have been used to measure the marketing efficiency and price spread to full fill the objectives of the research study.

2.2 Price Spread Analysis

Price spread in general is referred to as difference between the price paid by the ultimate consumer and that received by the growers per unit of the commodity. Price spread analysis would estimate the share of different market functionaries in the consumer's rupee and this would often facilitate the understanding of the relative efficiencies and otherwise of alternate marketing channels [6]. For the present study, concurrent margin method is used to analyze the price spread.

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

Where,

P_p = price paid by the consumer

P_f = price received by the farmer

Moreover, farmer's share in consumer's rupee was also worked out in the estimation of price spread.

2.3 Farmer's Share in Consumer Rupee

Further, the Farmer's share in consumer rupee was calculated with the help of the following formula. [7].

$$F_s = (F_p / C_p) \times 100$$

Where,

F_s = Farmer's share in consumer rupee (percentage)

F_p = Farmer's price

C_p = consumer's price

2.4 Estimation of Marketing Efficiency

The following formulae were used to estimate the marketing efficiency of different channels of marketing of Castor in the present study.

a) Shepherd's Formula

Shepherd evaluated marketing efficiency as the ratio of total value of the goods marketed to the marketing cost.

$$ME = [(V/I) - 1] * 100$$

Where,

ME = Farmer's share in consumer rupee

V= Farmer's net selling price
I = Price paid by the consumer

2.5 Garrett's Ranking Technique

The respondents were asked to rank their constraints in Castor production and marketing. In Garrett's ranking technique, these ranks were converted into per cent position by using the formula [8].

$$\text{Percent position} = 100 \times (R_{ij} - 0.5) / N_j$$

Where,

R_{ij} = Ranking given to the i^{th} attribute by the j^{th} individual
 N_j = Number of attributes ranked by the j^{th} individual.

By referring to the Garrett's table, the per cent positions estimated were converted into scores. Thus, for each factor the scores of various respondents were added and the mean values were estimated. The mean values thus obtained for each of the attributes were arranged in descending order. The attributes with the highest mean value were considered as the most important one and the others followed in that order [9].

3. RESULTS AND DISCUSSION

3.1 The Major Marketing Channels Involved in the Marketing of Castor in Namakkal District

The research study found that the Castor producers sold their produce to wholesalers, processors, or local dealers. While larger farmers sold directly to distributors, smaller farmers typically sold to local traders due to the distance their produce needed to travel. The study found that the Castor region was geographically closer to major markets like Namakkal and Tiruchengode, with better road and transportation infrastructure. This allowed larger producers to easily transport their produce to

wholesalers and processors, where they could fetch higher prices compared to small farmers.

The various market channels through which Castor was sold were identified to gain insight into the marketing strategies and limitations employed in its promotion. The research revealed the following marketing channels in the study area: Castor growers sold their produce through three distinct channels, as outlined in Table 1.

Marketing of castor in Namakkal district revealed that Channel I, i.e. Producer, Village trader and Processor was the preferred choice for 40% of farmers surveyed. The main reason for choosing this channel was the convenience of selling their produce to village traders who paid immediately for their purchases. Channel II, i.e. Producer, Wholesaler and Processor was utilized by approximately 38.67% of respondents for their marketing needs. Farmers appreciated the fair prices they received when selling their produce to wholesalers through this channel. Only 21.33% of survey respondents opted to sell their produce directly to processing factories through Producer and Processor, i.e. Channel III.

3.2 Price Spread and Marketing Efficiency of Different Marketing Channels in Namakkal District

The distribution of consumer pricing for castor growers in Namakkal district across various marketing channels is shown in Table 2. It is evident that Channel I (i.e. Producer, Village trader and Processor) provide the highest percentage net price to farmers at 57.61%, followed by Channel III (i.e. Producer and Processor) at 53.00% and Channel II (i.e. Producer, Wholesaler and Processor) at 49.48%. Despite this, Channel III offers the most significant advantage to farmers in absolute terms. The data highlights that selling Castor directly to processors results in the largest share, although only a small number of farmers are currently utilizing this channel.

Table 1. Marketing channel followed by sample Castor farmers

Channel no.	Marketing channel	No. of farmers adopted
I	Producer → Village Trader → Processor	30 (40.00)
II	Producer → Wholesaler → Processor	29 (38.67)
III	Producer → Processor	16 (21.33)
	Total	75 (100.00)

Figures in parentheses indicate percentage to total

In terms of economic efficiency, Channel I was identified as the most efficient at 1.01, followed by Channel III at 0.92 and Channel II at 0.57. However, many farmers with limited resources and output are unable to access Channel I, leading them to lose market share to

intermediaries. To enable Castor growers to sell directly to consumers, it is crucial for them to receive financial support such as low-interest loans and incentives. Strategic marketing approaches are essential to reduce costs and enhance overall marketing efficiency.

Table 2. Price spread and marketing efficiency of different marketing channels (Rs. / Qtl.)

S. No.	Particulars	Channel I	Channel II	Channel III
1	Farmer			
	Gross price received by farmer	4134.00 (58.32)	4061.07 (50.20)	4081.08 (53.77)
A	Marketing cost			
I	Packing material cost	23.15 (0.33)	23.15 (0.29)	23.15 (0.31)
ii	Loading/ unloading	27.72 (0.39)	27.72 (0.34)	27.72 (0.37)
iii	Transport cost	-	7.40 (0.09)	7.40 (0.10)
	Sub total	50.87 (0.72)	58.27 (0.72)	58.27 (0.77)
B	Net price received by farmer	4083.13 (57.61)	4002.80 (49.48)	4022.81 (53.00)
2	Village Trader			
	Price paid by village trader	4083.13(57.61)	-	-
A	Marketing cost			
I	Packing material cost	55.65(0.79)	-	-
ii	Loading/ unloading	13.39(0.19)	-	-
iii	Transport cost	55.65(0.79)	-	-
	Sub total	124.69(1.76)	-	-
B	Profit margin	79.27(1.12)	-	-
C	Marketing Margin	203.96(2.88)	-	-
	Price received by village trader	4287.10(60.48)	-	-
3	Wholesaler			
	Price paid by wholesaler	-	4002.80(49.48)	-
A	Marketing cost			
I	Labour charge	-	60.84(0.75)	-
ii	Shop rent	-	601.40(7.43)	-
iii	Loading/ unloading	-	6.43(0.08)	-
iv	Losses	-	10.49(0.13)	-
	Sub total	-	679.16(8.40)	-
B	Profit margin	-	470.07(5.81)	-
C	Marketing Margin	-	1149.23(14.21)	-
	Price received by wholesaler	-	5152.03(63.68)	-
4	Processor			
	Price paid by processor	4287.10(60.48)	5152.03(63.68)	4022.81(53.00)
A	Marketing cost			
I	Cost of processing	445.17(6.28)	445.17(5.50)	445.17(5.87)
ii	Labour charge	27.42(0.39)	27.42(0.34)	27.42(0.36)
iii	Packing material cost	103.35(1.46)	103.35(1.28)	103.35(1.36)
iv	Loading/ unloading	6.88(0.10)	6.88(0.09)	6.88(0.09)
V	Transport cost	10.00(0.14)	10.00(0.12)	10.00(0.13)
	Sub total	592.82(8.36)	592.82(7.33)	592.82(7.81)
B	Profit margin	2208.15(31.15)	2345.15(28.99)	2974.37(39.19)
	Castor cake	1000.00(14.11)	2000.00(24.72)	1500.00(19.76)
C	Marketing Margin	3800.97(53.62)	4937.97(61.04)	5067.19(66.76)
	Price paid by processor	7088.07(100.00)	8090.00(100.00)	7590.00(100.00)
	Price Spread	3004.94	4067.19	3567.19
	Marketing Efficiency	1.01	0.57	0.92

Figures in parentheses indicate percentage to total

Table 3. Constraints faced by castor production by sample farmers

S. No.	Nature of Constraints	Mean Score	Rank
1	High incidence of insect- pests	67.40	I
2	Inadequate of labour supply	58.67	II
3	Monsoon failure	42.33	III
4	High cost of inputs	41.80	IV
5	High labour cost	39.80	V

Table 4. Constraints faced by castor marketing by sample farmers

S. No.	Constraints	Score	Rank
1	Insufficient storage facility	65.07	I
2	Lack of credit facility	62.27	II
3	High cost of labour	54.87	III
4	Lack of market information	32.80	V
5	Limited demand	35.80	IV

3.3 Constraints Faced by Castor Farmers in Castor in Namakkal District

Production constraints faced by castor farmers: The cultivation of castor has posed numerous challenges for farmers in the research region. As a result, a study was conducted to identify the primary obstacles hindering castor production in the area. The findings, outlined in Table 3, showcase the results of utilizing Garrett's ranking technique to assess the top five constraints reported by castor producers in the study region.

According to the producers surveyed, the most significant challenge they face is the prevalence of insect pests (67.40). Following closely behind is the issue of inadequate labour (58.67). The failure of the monsoon was identified as the third major obstacle, with a ranking of 42.33. Additionally, the high cost of plant protection chemicals and fertilizers was highlighted as the fourth concern, receiving a ranking of 41.80. Lastly, high labour costs for castor production were reported as the fifth major issue impacting castor producers, with a ranking of 39.80. Overall, these findings shed light on the key challenges faced by castor producers in the research region, providing valuable insights for future interventions and support strategies.

Marketing constraints faced by castor farmers: The study conducted on castor growers revealed that they faced various marketing challenges. Table 4 displays the results of rating the top five marketing limitations using Garrett's ranking technique. The primary obstacle identified by Castor growers was inadequate storage facilities, with a rating of 65.07. Following

closely behind was a lack of financial resources, rated at 62.27 by the castor farmers. The high cost of labour was also a significant barrier, with a rating of 54.87. Additionally, low demand (35.80) and a lack of market knowledge (32.80) were highlighted as key marketing-related challenges faced by Castor growers. Overall, the study sheds light on the obstacles that castor growers encounter in marketing their products, emphasizing the importance of addressing these challenges to ensure the success of the industry.

4. CONCLUSIONS

According to the results of the current study, Castor producers typically sold their harvest to local village merchants or wholesalers and processors. While larger-scale farmers usually sold directly to these larger entities, most farmers in the area chose to sell their Castor produce to local traders. The research identified three distinct marketing channels within the study area. Approximately 40% of farmers used channel I, which involved Producer Village Trader and Processor, 38.67% used channel II, which involved Producer, Wholesaler, and Processor, and 21.33% used channel III, which involved Producer and Processor for selling their goods.

The price spread for channels I, II, and III was Rs. 3004.94, Rs. 4067.19, and Rs. 3567, respectively, with Channel II commanding the highest price spread and Channel I the lowest. The percentage of the consumer rupee that ultimately reached the farmer was highest in channel I at 57.61%, followed by channel III at 53.00%, and channel II at 49.48%. Using Shepherd's approach, channel I demonstrated the highest marketing efficiency index at 1.01,

with channel III following at 0.92 and channel II at 0.57.

In this determination, the study highlights the different marketing channels used by Castor producers in the area and their impact on price spread and efficiency. The findings provide valuable insights for producers looking to optimize their marketing strategies and maximize their profits.

5. POLICY IMPLICATIONS

- The marketing efficiency of agricultural commodities like castor may not always increase with value addition. Before making changes to the marketing system, the benefits should be carefully considered to ensure they reach the farmer or customer.
- The Commission on Cost and Price can help address low prices by setting a minimum support price for castor raw materials and oil early on.
- Dealing with insect pests is crucial, and farmers should be given access to resistant cultivars and pest management methods. Weather-based crop insurance could protect against production risks.
- The lack of infrastructure is holding back the castor industry, and improvements are needed for processing, value addition, grading, packaging, storage, and market infrastructure. Encouraging farmers to add value to castor could be a profitable option.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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