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Price Spread Analysis of Castor in Salem and Namakkal District

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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

India is the world's largest producer of castor oil, producing over 75% of the total world's supply. Castor oil is unique owing to its exceptional diversity of applications. The oil and its derivatives are used in over 100 different applications in diverse industries such as paints, lubricants, pharmaceuticals, cosmetics, paper, rubber and more. Castor oil is possibly the plant oil industry's most underappreciated asset. This study is conducted in Salem and Namakkal district to find out the price spread among the marketing channels as well as the marketing efficiency of various marketing channels in the castor crop. Random sampling method was adopted for the study where the primary data has been collected from 100 castor farmers. Among the three marketing channels, the value chain III, namely Farmer – Processors (Oil Millers) - Retailers – Consumers was the most efficient value chain because it had the highest value chain efficiency 2.57 because it had fewer intermediaries than the other value chains.

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1. INTRODUCTION

Oilseed crops are the second most important agricultural product after cereals, accounting for 14% of total planted land. India, along with the United States, China, and Brazil, is one of the world's four major participants, being a key oilseed grower, oil producer, importer, and exporter [1,2]. These oilseeds are mostly grown in rainfed conditions and provide a source of income for small and marginal farmers in the country's arid and semi-arid habitats. The majority of vegetable oil produced in India comes from nine oilseeds: castor, rapeseed, mustard, sesame, safflower, niger, soybean, and sunflower, which constitute the edible group, and linseed and castor, which form the non-edible group. The plant Castor (*Ricinus communis* L.) is a belongs to Euphorbiaceae family [3-5].

Castor is native to Eastern Africa and originated in Ethiopia. Castor is a commercially significant plant across the world. Castor may have evolved in the tropical regions of both India and Africa. Castor has been used in Indian medicine from ancient times [6-8]. Castor is a significant non-edible industrial oilseed crop. Castor seed contains 45-48 percent non-edible oil, which is utilised in the home, medicine, and industry. Castor oil is a valuable vegetable oil derived from the seeds of the *Ricinus communis* plant. These seeds, often known as castor beans, contain ricin, a toxic enzyme. Castor oil is a colourless to light yellow liquid that has a unique flavour and odour [9,10]. To produce products for specific purposes, seeds must be crushed and pressed, followed by oxidation, hydrogenation, and heat treatments. It is largely utilised in the production of soaps, lubricants, hydraulic and brake fluids, paints, dyes, coatings, inks, cold resistant plastics, waxes and polishes, nylon, pharmaceuticals, and perfumes, among other things [11-14]. Growing global concerns about biofuels, particularly biodiesel and biopolymers, are driving castor oil to play a far greater role in the global economy [15-18]. Tamil Nadu is an important castor growing state in India, with an area of 15,000 hectare. Major castor producing districts are Salem, Namakkal, Erode, Dharmapuri and Perambalur. In Tamil Nadu castor is mostly raised as rainfed crop or intercrop with castor [19,20]. In Tamil Nadu 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 per ha and 3000 kg per ha as pure crop under irrigated ecosystem. Popular castor hybrids in Tamil Nadu are YRCH 1, DCH 519 and GCH 4.

In Tamil Nadu, the cultivation of castor is in high-risk regions where there are uncertain returns on investments. Managing price, production and marketing risks in castor cultivation is an area where little attention has been paid in the past, when compared to other oil seed crops [21-24]. A sustainable and efficient value chain might improve castor's contribution to local edible oil supply. As a result, it is essential to castor value chain and measure the efficiency of the actors in Tamil Nadu.

The present study has examined the following objectives:

1. To map the value chain of castor in the Salem and Namakkal districts.
2. To analyze the price spread of Castor in different Value chain.

2. METHODOLOGY

This study was conducted in Salem and Namakkal districts, as it had larger area under castor cultivation in Tamil Nadu, this study was purposively selected for the research. In Salem, two blocks namely Pethanaickenpalayam and Valapaddy; in Namakkal two blocks namely Trichengode and Elachipalayam were selected. Five villages from four blocks with five farmers from each village were selected at random based on the largest area under castor and totally 100 farmers were selected from twenty villages of four blocks. The intermediaries involved in marketing of castor in which 15 Wholesalers, 15 Village Traders 10 Retailers and 5 Processors were randomly selected to carry out the research.

3. RESULTS AND DISCUSSION

3.1 Mapping the Castor Value Chain Actors

3.1.1 Role of actors in castor value chain

1. Farmer (Producer)

Well drained red loamy fertile soil was preferred for the cultivation of castor. Local and University

variety seeds were used for castor cultivation. Irrigation was given immediately after sowing of seeds followed by weekly irrigation depending upon whether condition. Other cultural practices like weeding and spraying were done at the average cost of Rs.4006 and Rs.7830 per hectare respectively.

2. Village Traders

The wholesalers purchased the produce from the farmers. They sold the produce to the Wholesalers and processors.

3. Wholesaler

The wholesalers purchased the produce through Village traders or directly from the farmers. They sold the produce to the processors and consumers. Processors used produces for oil making and consumers purchased the oil for household and other uses.

4. Processor (Oil miller)

The processors purchased the produce from the wholesalers or through village traders, and they did value addition activities like drying, cleaning, sorting , processing , extraction of oil and they finally sold it to retailer or consumers. The processors decorticated the dry pods without charges in exchange of husk to the farmers. Most of the processors received the castor from the wholesalers.

5. Retailer

Retailers received castor oil from the processor through price negotiation. They purchased quality product in limited quantity. Retailers were breaking the bulk quantity and selling small or needed quantity to the consumers.

6. Consumer

Consumers bought the value added products directly from processors and also from the retailers and used it for consumption purposes.

3.2 Value Chain

In the present study, value chain is defined as the people and activities that bring agricultural product like castor from obtaining inputs and production in the field to the consumer, through stages such as processing, packaging and distribution.

The castor value chains identified for castor in the study area are as follows;

3.3 Value Chain I

Farmers – Village Trader – Wholesaler - Processors (oil miller) - Retailers – Consumers

3.4 Value Chain II

Farmers - Wholesalers - Processors (oil miller) – Retailers - Consumers

3.5 Value Chain III

Farmers - Processors (oil miller) - Retailers – Consumers

In the value chain I & II the processors purchased the product from the farmers through village traders, wholesalers or regulated market and process the product and sold it to retailers or consumers. In the value chain III, the processors purchased the product from the farmers directly and process the product and sold it to retailers or consumers.

3.6 Castor Value chain Mapping

In the value chain I, processors purchased the product from the farmers through village traders and wholesalers. Castor is processed into oil and oilcake and sold them to the retailers. Farmers did primary value addition activities like drying, cleaning, decorticating, grading and packing the castor. Village trader and Wholesaler performed repacking, storing and grading the product whereas the processor did major value addition of the castor in this chain. They also performed pressing, filtering, packing and labeling function. The retailers stored the product and sold the required quantity to consumers.

In the value chain II, the castor was purchased by wholesalers from the farmers and sold to processors. They performed similar functions as that of value chain I. Farmers, Wholesaler, processor and retailer perform similar function as that of value chain. The retailers stored the product and sold the required quantity to consumers.

In the value chain III, oil processor received the product directly from the farmers. The processors sold the product after value addition directly to the retailers. They performed similar functions as that of value chain II. The retailers sold the required quantity to consumer after storing it.

Table1. Price Spread across the Value chain

S.No	Particulars	Value chain I	Value chain II	Value chain III
1	**Farmers**	5495	5543	5650
		(56.09)	(57.19)	(58.94)
	Net price received	115	113	110
		(1.17)	(1.16)	(1.14)
	Marketing cost	5610	5656	5760
		(57.26)	(58.36)	(60.08)
	Gross price received			
2	**Village Traders**	5610	-	-
		(57.26)		
	Price paid			
	Marketing cost	45	-	-
		(0.45)		
	Marketing margin	155	-	-
		(1.58)		
	Price received	5810	-	-
		(59.30)		
3	**Wholesalers**			
	Price paid	5810	5656	
		(59.30)	(58.36)	
	Marketing cost	80	90	-
		(0.81)	(0.92)	
	Marketing margin	190	195	-
		(1.93)	(2.01)	
	Price received for oil	6080	5941	-
		(62.06)	(61.30)	
4	**Processors**			
	Price paid	6080	5941	5760
		(62.06)	(61.30)	(60.08)
	Marketing cost	530	545	545
		(5.41)	(5.62)	(5.68)
	Marketing margin	1380	1390	1405
		(14.08)	(14.03)	(14.65)
	Price received	7990	7876	7710
		(81.56)	(81.27)	(80.42)
	Price received for oil cake	1500	1500	1550
		(15.31)	(15.47)	(16.16)
5	**Retailers (Oil)**			
	Price paid			
	Marketing cost	7990	7876	7710
		(81.56)	(81.27)	(80.42)
	Marketing margin	64	67	69
		(0.65)	(0.69)	(0.71)
	Price received	128	130	135
		(1.30)	(1.34)	(1.40)
6	**Retailer (Oil Cake)**	8182	8073	7914
		(83.52)	(83.30)	(82.55)
	Price paid			
	Marketing cost	1500	1500	1550
		(15.31)	(15.47)	(0.47)
	Marketing margin	45	46	49
		(0.45)	(0.47)	(0.51)
	Price received	69	72	73
		(0.70)	(0.74)	(0.76)
7	**Consumers (Oil)**	1614	1618	1672

S.No	Particulars	Value chain I	Value chain II	Value chain III
		(16.47)	(16.69)	(17.44)
	Price paid			
8	**Consumers (Oil Cake)**	8182	8073	7914
		(83.52)	(83.30)	(82.55)
	Price paid			
	Price paid by consumers	1614	1618	1672
		(16.47)	(16.69)	(17.44)
	Price spread	9796	9691	9586
		2687	**2530**	**2264**

(Source: Primary data)
(Figures in parenthesis indicates percent to the total)

3.7 Analysis of Price Spread and Marketing Efficiency of Castor in Different Value Chain

3.7.1 Price Spread across the Value chain

The marketing cost, marketing margin and price spread for one quintal of castor were calculated and the results are presented in Table 1.

3.8 Value Chain I

After the harvest, the castor farmers performed value addition activities like cleaning and drying. After drying, farmers decorticated the castor pods. Total cost of transportation from farm to mill and mill to wholesaler was Rs.71/quintal and loading and unloading charges were Rs.44/quintal. The farmers sold the produce to village traders at the rate of Rs.5610/quintal. Village traders sold the produce to the Wholesalers at the rate of Rs.5810/quintal. Village traders earned the marketing margin of Rs.155/quintal and incurred marketing cost of Rs.45/quintal. Then, the wholesalers sold the produce to Processors at the rate of Rs.6084. Wholesalers earned the marketing margin of Rs.190/quintal and incurred marketing cost of Rs.80/quintal. Processors sold the produce at the rate of Rs.7990 per quintal of castor equivalent oil and Rs.1500 per quintal equivalent of oil cake to retailers. Processors earned the marketing margin of Rs.1380/quintal and incurred marketing cost of Rs.530/quintal. Oil retailers' marketing margin was Rs.128 per quintal and marketing cost was Rs.64 per quintal. Similarly, oil cake retailers' marketing margin was Rs.69 per quintal and marketing cost was Rs.45 per quintal. Retailers sold the produce at Rs.8182 per quintal of castor equivalent of oil and Rs.1614 per quintal of castor equivalent to oil cake to customers. From the table, the price spread was observed to be Rs.2687/quintal.

3.9 Value Chain II

In the value chain II, the farmer sold the produce to wholesalers at the price of Rs.5543/ quintal. The farmers performed cleaning, drying and decorticating before the sale. During the transaction to the wholesalers, the farmers incurred the marketing cost of Rs.113/quintal. Hence, the net price realized by the farmers was Rs.5556 per quintal. Wholesalers received the product from the farmers at the rate of Rs.5656/quintal and incurred the marketing cost of Rs.90/quintal. They sold the produce to Rs 5997/ quintal to the processors. The wholesalers received a marketing margin of Rs.195/quintal. Processors incurred marketing cost of Rs.545/quintal. Thus, they earned marketing margin of Rs.1390 per quintal. Processors sold the produce at the rate of Rs.7876 per quintal of castor equivalent oil and Rs.1500 per quintal equivalent of oil cake to retailers. Oil retailers' marketing margin was Rs.130 per quintal and marketing cost was Rs.67 per quintal. Similarly, oil cake retailers' marketing margin was Rs.72 per quintal and marketing cost was Rs.46 per quintal. Retailers sold the produce at Rs.8073 per quintal of castor equivalent of oil and Rs.1618 per quintal of castor equivalent to oil cake to customers. From the table, the price spread was observed to be Rs.2530/quintal.

3.10 Value Chain III

In the value chain III, the farmer sold the produce to Processors at the price of Rs.5650/ quintal. The farmers performed cleaning, drying and decorticating before the sale. During the transaction to the Processors, the farmers incurred the marketing cost of Rs.110/quintal. Processors received the product from the farmers at the rate of Rs.5760/quintal and incurred the marketing cost of Rs.545/quintal. Thus, they earned marketing margin of Rs.1405 per quintal. Processors sold the produce at the

rate of Rs.7710 per quintal of castor equivalent oil and Rs.1550 per quintal equivalent of oil cake to retailers. Oil retailers' marketing margin was Rs.135 per quintal and marketing cost was Rs.69 per quintal. Similarly, oil cake retailers' marketing margin was Rs.73 per quintal and marketing cost was Rs.49 per quintal. Retailers sold the produce at Rs.8992 per quintal of castor equivalent of oil and Rs.1672 per quintal of castor equivalent to oil cake to customers. From the table, the price spread was observed to be Rs 2264/ quintal.

It could be seen from the table 1 that the farmer got the maximum share of consumer's price in channel I (56.09) followed by channel-II (57.19) and channel-III (58.94). However in absolute terms farmer got maximum benefit in channel-III.

4. CONCLUSION

In value chain analysis-mapping, core processes involved in castor value chain such as cultivation, processing and retailing were identified. Farmers, regulated market, wholesaler, processor and retailers were identified as the actors and their specific activities were also identified to find out cost and margin of the actors of the value chain. In value chain of castor, processors, retailers were playing vital role in movement of castor to the final destination. In the price spread analysis, the costs involved in different stages were identified and calculated. It is concluded that the net price received by farmers directly from Village trader was Rs.5495 per quintal and through wholesaler was Rs.5543. Price spread was the lowest in the value chain I (Rs.2264/quintal) and price spread was the highest in value chain I (Rs.2687/quintal). It is concluded that farmer got higher profit in channel-III. It is evident from the results that maximum share is achieved by selling castor directly to processor but very less percentage of farmers could adopted this channel. To overcome this, processors can enter contract with the farmers for assured castor supply with prefixed price. Contract agreement would encourage farmers to expand area under castor cultivation. Markets can be strengthened with online eNAM platform in the study area to increase the participation of processors in the different part of the country which would improve the efficiency of value chains.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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