



ESTIMATION OF COST OF CULTIVATION AND EVALUATION OF THE MARKETING CHANNELS OF TAPIOCA IN TAMIL NADU

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Abstract

Tapioca being one among the important crops cultivated in Tamil Nadu, the study attempted to estimate the cost of cultivation involved and to analyse the efficiency of different channels through which tapioca was marketed. Tamil Nadu formed the universe of the study. Salem district was purposively selected since area wise it stood first in tapioca cultivation among different districts of Tamil Nadu. With regard to selection of block, Gangavalli was purposively selected, since, area and production wise, the block occupies the first position in Salem district. Further, in the selected block the villages namely Pachamalai, Gudamalai, Kadambur and Aniyampatti were purposively selected, since area wise these villages occupy the first four positions in Gangavalli block. The reference year for the study was the agriculture year 2017-18. The result revealed that cultivation of tapioca is a profitable venture. But as far as marketing is considered, the bulkiness and perishability of tapioca limits the bargaining power of farmers. Also market intermediaries assume a dominating role ultimately reducing the farmer's share on consumer rupee. The study suggests that the farmers may be encouraged to form region based "Tapioca Farmers Association" or "Co-operative marketing Society" through which marketing of tapioca may be routed through, so as to establish a collective bargaining mechanism. This system could also curtail the role of unnecessary market intermediaries.

Key words: Cost of cultivation, Price spread.

Introduction

In India, the cultivation of tapioca is mainly undertaken in Tamil Nadu, Kerala, Andhra Pradesh, Nagaland, Meghalaya, Assam, etc. Tamil Nadu is the leading state, in which the cultivation area of the tapioca is 86,900 ha with a production of 2605.9 million tonnes followed by Kerala occupying the second position with a production of 2588.4 million tonnes and Andhra Pradesh occupying the third position with a production of 258.0 million tonnes (Horticulture Statistics Division, Department of Agriculture Cooperation and Farmers Welfare 2015). In Tamil Nadu, tapioca is cultivated in about ten per cent of the area and contributes to more than 70 percent of the total production to the country.

The foremost problem for tapioca farmers is that they are forced to sell their produce as soon as the harvest is over because of poverty and prior indebtedness added with the perishability and bulkiness of the produce.

Another problem is that there are large number of middlemen between the cultivators of tapioca and consumers. The middlemen take away a large share from the consumers' rupee. Generally, 50 percent of the price paid by the consumers goes to middlemen.

The sago factories are the major consumers of raw tuber. Due to fluctuation in rainfall and other reasons, the area coverage remains uncertain in almost all the years resulting in an unassured supply of raw material to sago factories. The price fluctuation in tapioca industry is more pronounced always due to the supply – demand mismatches.

Objectives

Considering the existing scenario, the present study was undertaken with the following objectives.

1. To estimate the cost of cultivation and income obtained by tapioca farmers.

- To analyse the price spread pattern of the tapioca marketing in Tamil Nadu.

Materials and Methods

Study Area

The study was conducted to analyse the production and marketing of tapioca in Tamil Nadu. Tamil Nadu formed the universe of study. Salem district was purposively selected as sample district since area wise it occupied the first position in tapioca cultivation in Tamil Nadu. Gangavalli block was purposively selected, since, area and production wise, it occupies the first position in Salem district. Further, in the selected block the villages namely Pachamalai, Gudamalai, Kadambur and Aniyampati were purposively selected, since area wise these villages occupy the first four positions in Gangavalli block.

Totally 120 sample respondents were selected in the study area by using stratified random sampling technique. Apart from this, primary data was collected from 10 sago industries, 20 sago wholesaler, 20 tuber wholesaler, 20 value addition processor and 30 retailers.

Tools of Analysis

Cost Analysis

Raju and Rao (1990) categorized and estimated different costs as involved in cultivation of an annual crop as Cost A₁, Cost A₂, Cost B and Cost C.

Cost A₁: It consists of all actual expenses in cash and kind incurred in production by the owner operator. It includes expenses incurred on human labour, bullock labour, machine labour, manures and fertilizers, plant protection chemicals, irrigation charges, interest on working capital, depreciation on capital assets and land tax.

Cost A₂: Cost A₁ plus rent paid for leased in land.

Cost B: Cost A₂ plus imputed rental value of owned land plus interest on fixed capital.

Cost C: Cost B plus imputed value of family labour. Cost C is the total cost of cultivation or gross cost.

Net Income: Gross return minus Cost C.

Cost of Production per Unit

Cost of production per tonne of tapioca was arrived at by dividing the net cost of cultivation per acre by the total per acre yield of tapioca in tonnes.

$$\text{Cost of Production} = \frac{\text{Cost of Cultivation} - \text{Value of by product}}{\frac{\text{Yield}}{\text{acre}}}$$

Price Spread Analysis

Price spread in general is referred to as the difference between the price paid by the ultimate consumer and what actually 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 alternative marketing channels. In the study, concurrent margin method was used to analyze the price spread.

Information on price prevailed and the cost involved in marketing of Tapioca at different stages of all identified marketing channels were collected from the farmers and market functionaries. The cost of marketing included cost spent on transport, loading and unloading, commission charge and other incidental expenses incurred for marketing the produce. Data on profits of the various market functionaries involved in moving the produce from the initial point of production till it reached the ultimate consumer were collected.

Farmer's Share in Consumer Rupee

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

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

Where,

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

F_p = Farmer's price

C_p = Consumer's price

In the price spread analysis marketing cost and profit margin and their expression as a percentage to the consumer's rupee were computed. Moreover, farmer's share in consumer's rupee was also worked out.

Garrett's Ranking Technique

To study the constraints in marketing of tapioca, Garrett's ranking technique was employed (Garrett, 1969). In this section, Garrett's Ranking Technique was used to rank the factors that affected the marketing of tapioca in the study area. The major factors that affect the marketing were identified and the growers were asked to rank the factors in order of their importance. The order thus given by the farmers were converted in to ranks by using the following formula:

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

Where,

R_{ij} = Ranking given to the ith attribute by the jth

individual

N_j = Number of attributes ranked by the j^{th} individual

By referring to the Garrett’s table, the percent 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 was considered as the most important one and the others followed in that order.

In the study Garrett’s ranking technique was used to identify the problems encountered by Tapioca producer and sago processing unit.

Results and Discussion

Cost of Cultivation of Tapioca

To estimate the cost of cultivation, cost concepts given by Raju and Rao were used. The cost of cultivation of tapioca has been worked out and the details are presented in table 1.

As per the information presented, for land preparation annually 9 human labours were used with Rs. 300 per labour which is estimated as Rs. 2,700 per acre. In the preparatory stage, tractor was used once for 3 hours for ploughing at the rate of Rs. 800 per hour, which cost Rs. 2,400 per acre.

Farmyard manure was the only organic manure used for the production of tapioca. Four tonnes of FYM was applied at the cost of Rs. 2,000 per tonne, which is estimated as Rs. 8,000. For the application of organic manure 2 men labours were used at the wage rate of Rs.300 per labour which was estimated as Rs. 600 per acre. Urea (60kg), Potash (55kg) and Complex (130kg) were the main inorganic fertilizers used for production of tapioca, which cost Rs. 6/kg, Rs.6/kg and Rs.16/kg respectively, and they accounted to Rs. 360, Rs. 360 and Rs. 2,080 per acre. For the application of inorganic fertilizers, 2 men labour were engaged at the wage rate of Rs.300 per labour, which was estimated as Rs. 600 per acre. The cost of total inorganic fertilizer applied was estimated as Rs. 3,370 per acre.

Yellow sticky traps and bio fungicide (*Tichoderma viride*) were the two management practices used to control the pest. The yellow sticky traps cost Rs. 1,000 per acre. 2.5 kg bio fungicide was applied which cost Rs. 400 per kg, and it accounted to Rs. 1,000/acre. For pest management, 2 men labours were engaged at the cost of Rs.300 per labour, which was estimated as Rs. 600. The total expenses estimated for plant protection accounted to Rs. 2,600.

Weeding was one of the main intercultural operations in tapioca cultivation. It was done 4 times in a cultivation. Each time 4 labours were used at the rate of Rs. 200 per labour, which was estimated as Rs. 800 per acre. Totally, the weeding expenses accounted to Rs. 3,200. The crop was irrigated 8 times per year. For every irrigation 2 men labours were used at the cost of Rs. 400 per labour, which was estimated as Rs. 6,400 per acre.

For harvesting of tapioca 15 women labours were used at the wage rate of Rs.200 per women labour. The estimated total expense on harvesting was Rs. 3,000 per acre. Other miscellaneous expenses accounted to Rs. 1,000. Depreciation on fixed capital was estimated as Rs. 600. The total operating cost was estimated as Rs. 33,270. Interest on working capital was estimated at the rate of 7 per cent. It worked out to Rs. 2,328.90. Since tapioca cultivation was done in own land by all respondents, rent paid for leased-in-land was excluded. Rental value of owned land was estimated as one third value of output which accounted to Rs. 12,066.30. The imputed wages for the family labour engaged accounted to Rs. 1,000 per annum. The summation of Cost B and family labour wages is considered as Cost C which accounted to Rs. 69,265.20. The average estimated yield of tapioca was 15 tonnes per acre, whereas average output price was Rs. 7/kg. The gross return is estimated as Rs. 1,05,000/acre, whereas net return of farmer was

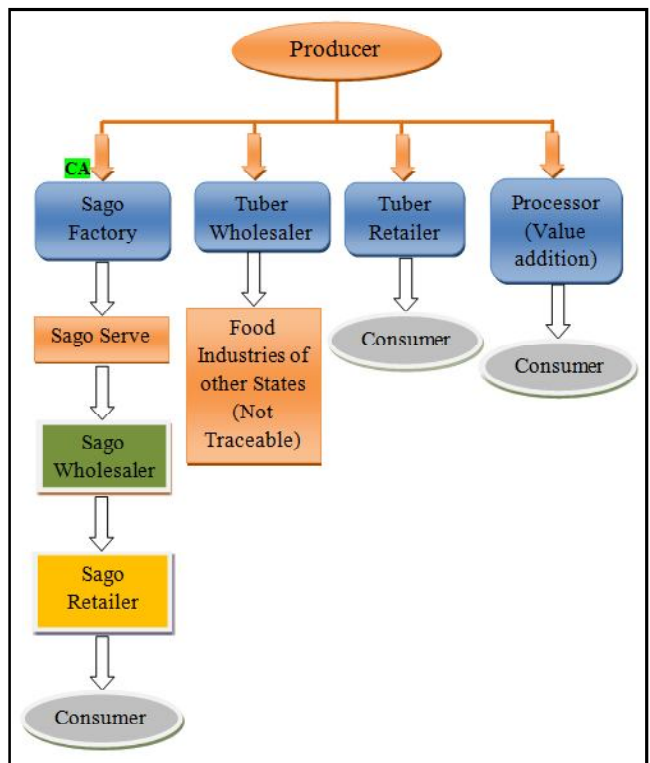


Fig. 1. Marketing Channels of Tapioca in Salem District.

Table 1: Cost of Cultivation of Tapioca.

Particulars	Quantity with Units	(Rs/acre)
		Cost (Rs. P.)
Cost A₁		
1. Land preparation		
a. Human labour	9 labour @ Rs.300/lab	2,700.00
b. Tractor labour	3 hrs @ Rs.800/hr	2,400.00
2. Organic fertilizer	FYM 4 tonnes @ Rs.2000/1 ton, 2 men lab @ Rs.300/lab	8,600.00
3. Inorganic fertilizer	Rs.2,770 (Urea (60kg), Potash (55kg) and Complex (130kg) @ Rs.6/kg, Rs.6/kg and Rs.16/kg), 2 men lab @ Rs.300/lab	3,370.00
4. Plant protection	IPM practice (Yellow sticky traps) @ Rs.1,000 and Trichoderma viride 2.5 kg @ Rs.400/kg with 2 men lab @ Rs.300/lab	2,600.00
5. Irrigation charge	8 times, 16 lab @ Rs.400/lab	6,400.00
6. Weeding	4 times, 16 women lab @ Rs.200/lab	3,200.00
7. Harvesting	15 lab @ Rs.200/lab	3,000.00
8. Miscellaneous cost	-	1,000.00
Total	-	33,270.00
Interest on working capital @ 7%	-	2,328.90
Depreciation on fixed capital @10%	-	600.00
Total Cost A ₁	-	36,198.90
Rent paid for leased-in-land	-	-
Total Cost A ₂	-	36,198.90
Rental value of owned land	1/3 value of output	12,066.30
Interest on owned fixed capital	-	20,000.00
Total Cost B	-	68,265.20
Family labour wages	2 women labour @ Rs.200/labour 3 men labour @ Rs.200/labour	1,000.00
Total Cost of C	-	69,265.20
Yield (kg)	-	15,000.00
Output Price (Rs/Kg)	-	7
Gross Return	-	1,05,000.00
Net Return	-	35,734.80
Benefit Cost Ratio	-	1.51
Cost of Production (Rs/Kg)	-	4.61

Rs. 35,734.80 per acre. The average cost of production for 1 kg tuber was Rs. 4.61.

Major Marketing Channels of Tapioca Marketing

Four major marketing channels were identified for

Table 2: Consolidated Statement of Price Spread for Different Marketing Channels of Tapioca.

Particulars	(Rs/ kg)			
	Channel I	Channel II	Channel III	Channel IV
Producer received price	7	15	14	18
Marketing cost (1)	8.69	2.95	1.87	17.72
Marketing margin (2)	5.81	4.05	4.13	44.28
Value addition in chain (1+2)	14.50	7.00	6.00	62.00
Consumer price	21.50	-	20.00	80.00
Producer's share in consumer rupee	32.56	-	70.00	23.50

tapioca in the study area as presented in fig. 1. In marketing channel I, the sago factory purchased the produce from the farmer through commission agent. After processing, the sago factory sells the produce to sago serve directly. Sago serve sells the produce to sago wholesaler through tender. The sago wholesaler sells the produce to sago retailer and ultimately sold to the consumer. In the channel II, the wholesaler (tuber) directly purchased the produce from the farmer and export to Kerala. In the channel III, farmer directly sells the produce to the retailer (tuber) and sold to the consumer. In the channel IV, the farmer directly sells the produce to processor (value addition) and the produce sold to ultimate consumer. The price spread pattern with the four channels are presented in table 2, in a consolidated form.

Table 3: Garrett Ranking for Constraints Faced by Farmer

S.No	Particulars	Rank
1.	Price fluctuation	I
2.	Cartel formation by Sago factory	II
3.	Malpractice in point scale fixation	III
4.	Lack of regulated market	IV
5.	Perishability	V
6.	Lack of government support	VI

Table 4: Garrett Ranking for Constraints Faced by Sago Factory

S.No	Particulars	Rank
1.	Price fluctuation	I
2.	Exploitation by middleman	II
3.	Procurement price fluctuation at sago serve tender	III
4.	Labour scarcity	IV
5.	High processing cost	V
6.	Lack of transport facilities	VI
7.	Finance problem	VII
8.	Market competitors	VIII

Inferences with Price Spread Analysis

The following salient inferences could be derived from the details presented in table 2.

- » In the four Tapioca marketing channels, the price received by the farmer was high in channel IV compared to the other three channels. It should also be taken into account that the present volume of transaction as well as future prospects is limited in channel IV.
- » Channel IV has high marketing cost and marketing margin followed by channel I and the lowest one is channel III.
- » The price received by farmer is high in channel II also. The prospects in this channel II has to be explored and exploited further.

Constraint Analysis by Garrett Ranking Technique

Constraints Encountered by Farmer

As evident from table 3, among the various problems faced by tapioca farmers, price fluctuation ranks first followed by cartel formation by sago factories, malpractice in point scale fixation, perishability and lack of government support. The first and second problem could be solved by government interventions by playing a role in regulating the price.

Constraints Encountered by Sago Factory

As evident from table 4, price fluctuation ranks first followed by exploitation by middleman, procurement price fluctuation at sago serve tender, labour scarcity, high processing cost, lack of transport facilities, finance problem and market competitors. Price fluctuation in the tapioca market is the major problem faced by tapioca farmers as well as sago industry. As discussed earlier, the governmental intervention is inevitably needed, so as to place in order a regulatory mechanism for managing tapioca prices throughout the year.

Policy Suggestions

- i. The bulkiness and perishability of tapioca limits the bargaining power of farmers. Farmers may be encouraged to form region based "Tapioca Farmers Association" or "Co-operative marketing Societies", through which marketing of produce may be routed through, so as to establish a collective bargaining mechanism. This system could also curtail the role of unnecessary market intermediaries.
- ii. The prospects for selling tapioca to food processing industries of other states seems to be enormous. The stakeholders need to explore and exploit this opportunity for the benefit of farmers.

Price fluctuation is an often experienced menace in tapioca industry affecting the farmer as well as sago industry. The government intervention is inevitably needed in this regard, so as to place in order a permanent regulatory mechanism for managing the tapioca prices throughout the year.

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