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Impact Assessment of Cassava YTP 2 Cultivation in Tamil Nadu

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A B S T R A C T

Cassava is being one of the essential crop cultivated in Tamil Nadu, this study was attempted to estimate the impact assessment and to examine the efficiency of different marketing channels. 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. Multi-stage random sampling pertains to the selection of the blocks followed by villages. Thalivasal and Macheri block was selected in Salem district. Three villages from Thalivasal block namely Kamakapalayam, Sitheri and Thiyaganur; Three villages from Macheri block namely Vellar, Pukkampatti and Olaipatti was selected purposively. From each village 15 cassava growers. This will constitute 90 cassava growers were selected randomly. Apart from this, primary data was collected from 10 sago industries, 20 sago wholesaler, 20 tuber wholesaler, 20 value addition processor and 30 retailers. The reference year for the study was the agriculture year 2021-22. The result revealed that cultivation of Cassava YTP 2 is a profitable venture. But as far as marketing is considered, the bulkiness and perishability of Cassava YTP 2 limits the bargaining power of farmers. 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 Cassava YTP 2 may be routed through, so as to establish a collective bargaining mechanism. This system could also restrict the role of unnecessary market intermediaries.

INTRODUCTION

In India, the cultivation of Cassava 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 Cassava 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. In Tamil Nadu, Cassava 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 world-class problem for Cassava farmers is that they are forced to sell their produce as soon as the harvest is finished 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 Cassava and consumers. The middlemen proceeds 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 insecure supply of raw material to sago factories. The price fluctuation in Cassava industry is more noticeable always due to the supply - demand mismatches.

THEORETICAL FRAMEWORK

Considering the existing set forth, the present study was undertaken with the following objectives

1. To assess the impact of Cassava YTP 2 cultivation in Tamil Nadu;
2. To analyse the price spread of the Cassava YTP 2 marketing in Tamil Nadu
3. To study the constraints and to suggest suitable measures to improve the Cassava YTP 2 productivity

METHODS

The study was conducted to analyse the impact assessment, production and marketing of Cassava YTP 2 in Tamil Nadu. Multi-stage random sampling pertains to the selection of the blocks followed by villages. Thalivasal and Macheri block was selected in Salem district. Three villages from Thalivasal block namely Kamakapalayam, Sitheri and Thiyaganur, Three villages from Macheri block namely Vellar, Pukkampatti and Olaipatti was selected purposively. From each village 15 cassava growers. This will constitute 90 cassava growers were selected randomly. Apart from this, primary data was collected from 10 sago industries, 20 sago wholesaler, 20 tuber wholesaler, 20 value addition processor and 30 retailers.

1. Tools of Analysis

Cost Analysis

Raju and Rao [1990] categorized and estimated different costs as involved in cultivation of an annual crop as cost A , cost A , cost B and cost C.

1. Cost A_1: 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.
2. Cost A_2: Cost A_1 plus rent paid for leased in land.
3. Cost B: Cost A_2 plus imputed rental value of owned land plus interest on fixed capital.
4. Cost C: Cost B plus imputed value of family labour.
   Cost C is the total cost of cultivation or gross cost.
5. 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.

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

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.

$Fs = [Fp / Cp] \times 100$

Where,

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

Fp = Farmer's price Cp = 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.

RESULTS AND DISCUSSIONZ

Cost of Cultivation of Cassava YTP 2

To estimate the cost cultivation of Cassava YTP 2, cost concepts given by Raju and Rao were used. The cost of cultivation of Cassava YTP 2 has been worked out and the details are presented in table 1, for land preparation annually 10 human labours were used with Rs. 400 per labour which is estimated as Rs. 4,000 per acre. In the preparatory stage, tractor was used once for 3 hours for ploughing at the rate of Rs. 900 per hour, which cost Rs. 2,700 per acre.

Farmyard manure was the only organic manure used for the production of Cassava YTP 2. Five tonnes of FYM applied at the cost of Rs.2,000 per tonne, which is estimated as Rs.10,000. For the application of organic manure 2 men labours were used at the wage rate of Rs.400 per labour which was estimated as Rs. 800 per acre. Urea [50 kg], Potash [45 kg] and Complex [125 kg] 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. 300, Rs. 270 and Rs.2,000 per acre. For the application of inorganic fertilizers, 2 men labour were engaged at the wage rate of Rs.400 per labour, which was estimated as Rs.800 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.1,200 per acre. 2.5 kg bio fungicide was applied which cost Rs.450 per kg, and it accounted to Rs.1,125/acre. For pest management, 2 men labours were engaged at the cost of Rs.400 per labour, which was estimated as Rs.800. The total expenses estimated for plant protection accounted to Rs.3,125. Weeding was one of the main intercultural operations in Cassava YTP 2 cultivation. It was done 4 times in a cultivation. Each time 4 labours were used at the rate of Rs. 300 per labour, which was estimated as Rs.1,200 per acre. Totally, the weeding expenses accounted to Rs.4,800. 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 Cassava YTP 2, 15 women labours were used at the wage rate of Rs.300 per women labour. The estimated total expense on harvesting was Rs.4,500 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.41,195. Interest on working capital was estimated at the rate of 7 per cent. It worked out to Rs.2,328. Since Cassava YTP 2 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. The imputed wages for the family labour engaged accounted to Rs.1,800 per annum. The summation of Cost B and family labour wages is considered as Cost C which accounted to

Rs.77,989. The average estimated yield of Cassava YTP 2 was 15.5 tonnes per acre, whereas average output price was Rs.8/kg. The gross return is estimated as Rs.1,24,000/acre, whereas net return of farmer was Rs. 47,811 per acre. The average cost of production for 1 kg tuber was Rs.5.03.

Table 1. Cost of Cultivation of Cassava YTP 2

S. No	Particulars	Quantity with Units	[Rs/acre] Cost [Rs.]
	Cost A_1		
1	Land preparation		
a	Human labour	10 labour @ Rs.400/lab	4,000
b	Tractor labour	3 hrs @ Rs.900/hr	2,700
2	Organic fertilizer	FYM 5 tonnes @ Rs.2000/1 ton, 2 men lab @ Rs.400/lab	10,800
3	Inorganic fertilizer	Rs.2,570 Urea [50 kg], Potash [45 kg] and Complex [125 kg]	
		@ Rs.6/kg, Rs.6/kg and Rs.16/kg, 2 men lab @ Rs.400/lab	3,370
4	Plant protection	IPM practice [Yellow sticky traps] @ Rs.1,200 and Trichoderma virde 2.5 kg @ Rs.450/kg with 2 men lab @ Rs.400/lab	3,125
5	Irrigation charge	8 times, 16 lab @ Rs.400/lab	6,400
6	Weeding	4 times, 16 women lab @ Rs.300/lab	4,800
7	Harvesting	15 lab @ Rs.300/lab	4,500
8	Miscellaneous cost	-	1,500
	Total	-	**41,195**
	Interest on working capital @ 7%	-	2,328
	Depreciation on fixed capital @10%	-	600
	Total Cost A_1	-	**44,123**
	Rent paid for leased-in-land	-	-
	Total Cost A_2	-	**44,123**
	Rental value of owned land	1/3 value of output	12,066
	Interest on owned fixed capital	-	20,000
	Total Cost B	-	**76,189**
	Family labour wages	2 women labour @ Rs.300/labour 3 men labour @ Rs.400/labour	1,800
	Total Cost of C	-	**77,989**
	Yield [kg]	-	15,500
	Output Price [Rs/Kg]	-	8
	Gross Return	-	1,24,000
	Net Return	-	47,811
	Benefit Cost Ratio	-	1.62
	Cost of Production [Rs/Kg]	-	5.03

Major Marketing Channels Cassva YTP 2 Marketing

Four major marketing channels were identified for Cassava YTP 2 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.

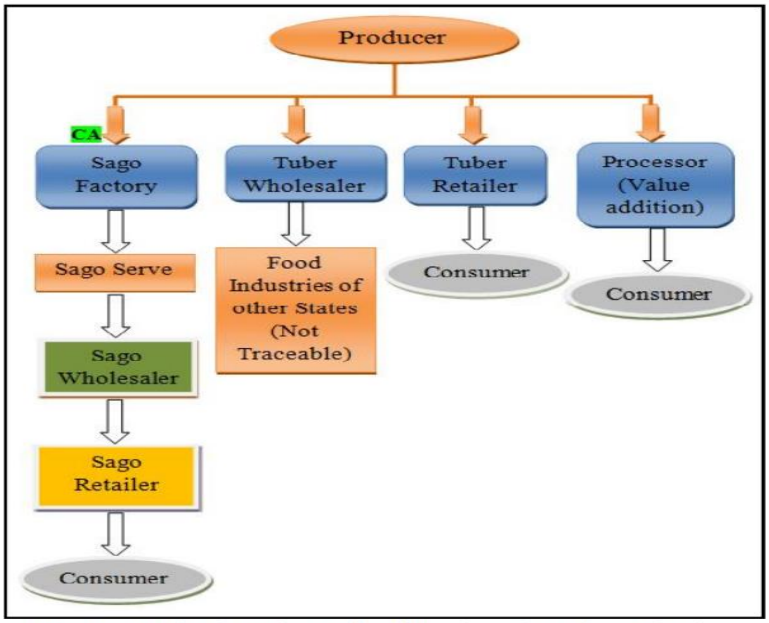

Fig. 1. Marketing Channels of Tapioca in Salem District.

Price Spread Analysis

T the details are presented in table 2. In the four Cassava YTP 2 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.

Table 2. Price Spread for Different Marketing Channels of Cassava YTP 2 [Rs/ kg]

S. No	Particulars	Channel I	Channel II	Channel III	Channe IV
1	Producer received price	8	16	15	19
2	Marketing cost [1]	9.75	3.50	2.85	18.65
3	Marketing margin [2]	6.70	5.25	5.00	55.50
4	Value addition in chain [1+2]	16.45	8.75	7.85	74.15
5	Consumer price	22.50	-	21.00	85.00

6	Producer's share in consumer rupee	33.75	-	72.00	24.75

Level of Satisfaction

It could be inferred from the Table 3, the respondents were reported that cent per cent [85 farmers] were satisfied with Cassava YTP 2 cultivation.

Table 3. Level of Satisfaction about Cassava YIP 2

S. No	Name of the District	Level of Satisfaction			
		0-25%	26-50%	51-75%	76-100%
1	Salem				85

Constraints Faced by the Cassava YTP 2 Farmers

As evident from table 4, among the various problems faced by Cassava YTP 2 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.

Table 4. Constraints Faced by Cassava YTP 2 Farmers

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

Constraints Encountered by Sago Factories

It was observed from the table 5, 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 Cassava YTP 2 market is the major problem faced by Cassava YTP 2 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 Cassava YTP 2 prices throughout the year.

Table 5. Constraints Faced by the Sago Factories

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

Monetization Value of Cassava YTP 2

The evident from the table 6, The total quantity of Cassava YTP 2 varieties sold from TCRS, Yethapur for the period from August 2019 to August 2020 was 88,865 cassava stems with the monetization value of Rs.2.36 crores and spread all over in Salem, Dharmapuri, Namakkal, Karur, Erode, Cuddalore, Thanjavur and Kallakurichy districts of Tamil Nadu.

Table 6. Area, Production, Productivity and Monetization Value of TNAU-TCRS, Yethapur Cassava Varieties in Tamil Nadu for the period from August 2019 to August 2020

S.No	District	No. of Cassava stems	Area Covered [In Ha.]	Average Productivity [kg/ha]	Production [in tonnes]	Value [Rs. In Crores]
1	Salem	51330	51.3	28.16	1445	1.445
2	Dharmapuri	2670	2.67	23.39	62.45	0.062
3	Namakkal	2210	2.21	31.96	70.63	0.071
4	Karur	4050	4.05	39.73	160.91	0.161
5	Erode	2280	2.28	26.13	59.58	0.060
6	Cuddalore	5135	5.14	28.78	147.8	0.148
7	Dindigul	1500	1.50	23.47	35.21	0.035
8	Thanjavur	4500	4.50	16.49	74.21	0.074
9	Coimbatore	100	0.10	23.06	2.31	0.002
10	Tiruvannamalai	1500	1.50	21.48	32.22	0.032
11	Tiruvallur	1200	1.20	12.23	14.68	0.015
12	Tiruppur	1300	1.30	29.3	38.09	0.038
13	Vellore	1500	1.50	18.37	27.56	0.028
14	Kallakurichi	4300	4.30	24.09	103.6	0.104
15	Perambalur	2750	2.75	16.75	46.06	0.046
16	Others	2540	2.54	16.5	41.91	0.042
	Total/Ave	**88865**	**88.865**	**23.7**	**2363**	**2.36**

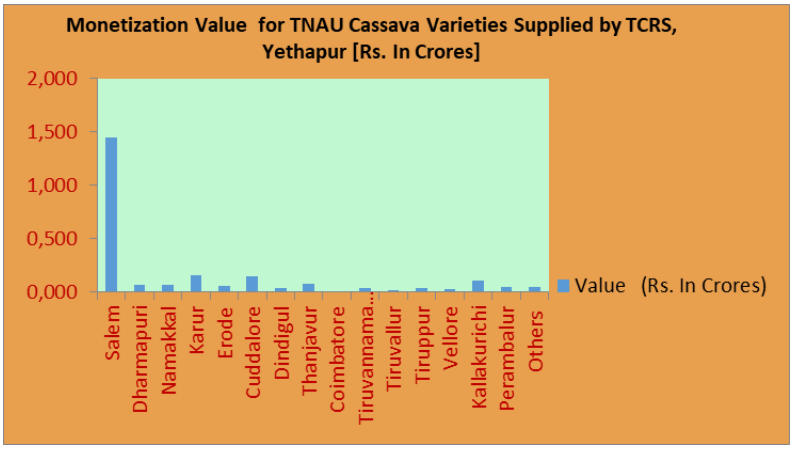

Figure 1: Monetization Value for TNAU Cassava Varieties Supplied by TCRS, Yethapur [Rs. In Crores]

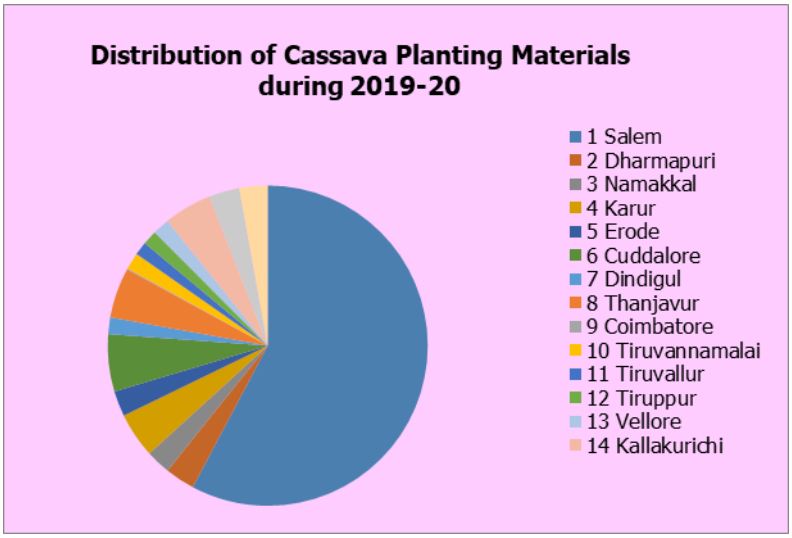

Figure 2: Distribution of Cassava Planting Materials during 2019-20

CONCLUSIONS AND RECOMMENDATIONS

1. The bulkiness and perishability of Cassava YTP 2 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.
2. The prospects for selling Cassava YTP 2 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.
3. Price fluctuation is an often experienced menace in Cassava YTP 2 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 Cassava YTP 2 prices throughout the year.

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