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Comparative analysis on cost of cultivation of Tapioca farmers in Salem District of Tamilnadu

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Abstract

Tuber crops are the most important food crops after cereals. Tapioca forms the stable food for more than six percent of the world population. Tapioca is a drought resistant crop grown mainly is dry areas and contributes significantly to the nutrition and livelihood of many people. Tapioca root is the basic raw material for sago and starch. In India, the cultivation of tapioca is mainly done in Tamil Nadu, Kerala, Andhra Pradesh, Meghalaya, Nagaland, Assam, etc. Tamil Nadu is the leading state, in which the cultivation of the tapioca is 811400 ha with a production of 3065.14 million tonnes. The main objective of the study is to estimate the cost of cultivation and income obtained by tapioca farmers in the study area. The average estimated yield of tapioca is 17 tonnes per acre, whereas average output price was Rs 12.33/kg. The gross return is estimated as Rs 209610/acre, whereas net return of farmer was Rs 70355.03 & 82638.63 per acre. The average cost of production for 1 kg tuber is Rs 8.19 & 7.46, and the benefit cost ratio is 1.50 & 1.65.

Key words : Gross return, Cost of production, Benefit cost ratio.

Tuber crops are the most important food crops after cereals. They are stable food for more than six percent of the world population and secondary stable food for a much higher percentage of the population. Tapioca *Manihot esculanta* is a perennial vegetative propagated shrub, grown throughout the lowland tropics. Tapioca is a drought resistant crop grown mainly in dry areas and contributes significantly to the nutrition and livelihood of many people. Tapioca root is the basic raw material for sago and starch.

India is the world tenth largest country in producing tapioca and exports cassava and its products such as raw tubers, flour and meal of sago to countries like United Arab Emirates, Saudi Arabia, Oman, European Nations, Kuwait and the United States of America. In India, the cultivation of tapioca is mainly done

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in Tamil Nadu, Kerala, Andhra Pradesh, Meghalaya, Nagaland, Assam, etc. Tamil Nadu is the leading state, in which tapioca cultivated in 811400 ha with a production of 3065.14 million tonnes followed by Kerala occupying the second position with a production of 2592.63 million tonnes and Andhra Pradesh occupying the third position 220.70 million tonnes. In Tamil Nadu, tapioca is cultivated in about ten percent of the area and contributes to more than 70 percent of the total production to the country.60 percent of the crop is grown under irrigated condition and 40 percent of the crop cultivated as rain fed condition in Salem, Namakkal, Erode, Dharmapuri and Kanyakumari district. For the preparation of the manuscript relevant literature[1-4] has been consulted.

Objectives of the study :

The main objective of the study is to estimate the cost of cultivation and income obtained by tapioca farmers in the study area and to find the difference in cost of cultivation and income of the tapioca farmers between the farmers nearer to sago industries and farmers who are cultivating far away from the sago industries.

Selection of study area :

Multiple stage and purposive sampling method was used for selecting the district, blocks and villages. The Salem district was purposefully selected for the study because Salem district is the leading producer of Tapioca. Pethanayakanpalyam and Gangavalli blocks were selected for the study purposefully. The criteria for selecting the blocks were that Pethanayakanpalayam block does not have a sago factory but Gangavalli block has a sago factory and both blocks are among the major cultivators of tapioca in Salem district. The sample farmers from the selected blocks were selected by probability proportionate sampling method and interviewed by using well-structured questionnaires.

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 + rent paid for leased land.

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

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

Gross income: Yield of the crop x Output price.

Net income: Gross return - Cost C.

Cost of Production per Unit :

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

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

Cost Benefit Ratio :

Cost benefit ratio was obtained by dividing the gross income by the total cost of production per acre.

$$\text{Benefit Cost Ratio} = \frac{\text{Gross returns}}{\text{Cost of cultivation}}$$

The Economics of Production of Tapioca :

To understand the economics of tapioca cultivation, cost and returns of the crop was estimated. Cost concepts given by Directorate of Economics and Statistics, Government of India were used as guidelines to study cost and returns and income level of the sample farmers. The cost of cultivation details of tapioca is presented in table-1.

Table-1. Cost of Cultivation of Tapioca in Sample Tribal Farms

Particulars	Salem			
	Pethanayakanpalayam		Gangavalli	
	Quantity with Unit	Cost (Rs/ac)	Quantity with Unit	Cost (Rs/ac)
Setts		2025		1820
Human labour	5 men labour @ Rs.500/lab. 3women labour @ Rs.300/lab	3400	5 men labour @ Rs.500/lab. 3women labour @ Rs.300/lab	3400
Tractor labour	3 hrs @ Rs. 1000/hr	3000	3 hrs @ Rs. 900/hr	2800
Organic fertilizer	FYM 3 tonnes @ Rs. 2000/ tons, 2 men lab,2 women lab	7600	FYM 3 tonnes @ Rs. 2000/ tons, 2 men lab,2 women lab	7600
In organic Fertilizers	Complex 3 bags @ Rs.1200/ bag, Urea 1 bag @ Rs.330, Potash 3 bags @Rs.2000/ bag, 4women lab	11130	Complex 3 bags @ Rs.1150/bag, Urea 1 bag @ Rs.310, Potash 3 bags @Rs.1800/bag, 4women lab	10360
Plant protection Chemicals and Growth regulators	IPM practice (yellow sticky traps) @ 1300 and Trichoderma vride 2.5 kg @ 430/kg with 2 men lab	3375	IPM practice (yellow sticky traps) @ 1250 and Trichoderma vride 2.5 kg @ 400/kg with 2 men lab	3250
Irrigation charge	10 times, 20 men lab	10000	10 times, 20 men lab	10000
Weeding	4 times,16 women lab	4800	4 times,16 women lab	4800
Harvesting	13 men lab @ Rs. 784. (600/ tones), 3 women labs. Average 17 tonnes.	11100	13 men lab @ Rs. 784. (600/ tones), 3 women labs. Average 17 tonnes.	11100
Transport	Rs. 700/tones	11900	Rs.300/tones	5100
Broker commission	Rs.100/tones	1700	Rs.70/tones	1190
Wastage	50kg/tones	10480.50	50kg/tones	10480.50
Miscellaneous cost	-	1000	-	1000
Total		**81510.50**		**72900.50**
Interest on working capital @ 7%	-	5705.73	-	5103.03

Depreciation on fixed capital @10%	-	800	-	800
Cost A_1		**88016.23**		**78803.53**
Rent paid for leased-in-land	-		-	
Cost A_2	**-**	**88016.23**	**-**	**78803.53**
Rental value of owned land	1/3 value of output	29338.74	1/3 value of output	26267.84
Interest on owned fixed capital	-	20000	-	20000
Cost B	**-**	**49338.74**	**-**	**46267.84**
Imputed value of family labour	**2 men lab, 3women lab,**	**1900**	**2 men lab, 3women lab,**	**1900**
Cost C	**-**	**1900**	**-**	**1900**
Total Cost of C (A+B+C)	**-**	**139254.97**	**-**	**126971.37**
Yield (kg)	**-**	**17430**	**-**	**18280**
Output price (Rs/kg)	**-**	**12.33**	**-**	**12.33**
Gross Income	**-**	**214911.90**	**-**	**225392.40**
Net Income	**-**	**75656.93**	**-**	**98421.03**
Benefit Cost Ratio	**-**	**1.54**	**-**	**1.77**
Cost of Production (Rs/kg)	**-**	**7.98**	**-**	**6.94**

Source: Computed based on Primary data

Using the above information that Pethanayakanpalayam and Gangavalli blocks, for land preparation, annually 5 men labour, 3 women labour, human labours were used with Rs 500 &300 per labour which is estimated as Rs 3400 per acre. In the preparatory stage, tractor was used once for 3 hours for ploughing at the rate of Rs 1000 & 900 per hour, which cost Rs 3000 &2800 per acre.

Farmyard manure is the only organic manure used for the production of tapioca. 3 tonnes of FYM were applied at the cost of Rs 2000 per ton, which is estimated as Rs 6000. For the application of organic manure 2 men, 2 women labours were used with the cost of Rs 500 & 300 per labour which is estimated as Rs 1600 per acre. Urea (1 bag), complex (3 bag) and potash (3 bag) are the main inorganic fertilizers used for production of tapioca, which costs Rs 330/bag & 310/bag, Rs 1200/bag & 1150/bag and Rs2000/bag & 1800/bag respectively, which accounted to Rs 330 & 310, Rs 3600 & 3450 and Rs 6000 & 5400 per acre. For the application of inorganic fertilizers, 4 women labor was used at the rate of Rs 300 per labour, which is estimated as Rs 1200 per acre. The cost of total inorganic fertilizer applied was estimated as Rs 11130 & 10360 per acre.

Yellow sticky traps and bio fungicide

(Tichoderma viride) are the two management practices were used to control the pest. The yellow sticky traps cost Rs 1300& 1250 per acre. 2.5 kg bio fungicide was applied which costs Rs 430 & 400 per kg, it accounted to Rs 1075 & 1000/acre. For pest management, 2 men labours were engaged at the cost of Rs 500 per labour, which is estimated as Rs 1000. The total amount estimated for plant protection accounted to Rs 3375 & 3200.

Weeding is one of the main intercultural operations in tapioca cultivation. It is done 4 times in cultivation. Each time 4 labours were used at the rate of Rs 300 per labour, which is estimated as Rs 1200 per acre. Totally, the weeding expenses accounted to Rs 4800. The crop is irrigated 10 times per year. For every irrigation 2 men labours were used at the cost of Rs 500 per labour, which is estimated as Rs 10000 per acre.

For harvesting of tapioca 13 men labour were used at the tonne rate Rs.600/ tonnes and 3 women labours were used at the wage rate of Rs 300 per women labour. The estimated total expense on harvesting is Rs 11100 per acre. For transport charges of tapioca Rs.700 & 300/tonnes. The estimated total expense on transport is Rs 11900 & 5100. For broker commission charge is Rs.100 & 70/tonnes. The estimated total expense on broker commission charge is Rs. 1700 & 1190. Wastage is 50kg/tonnes at the rate of Rs. 12.33/kg. The estimated total expense on wastage is Rs. 10480.50. Other miscellaneous expenses accounted to Rs 1000. The total operating cost is estimated as Rs 81510.50 & 72900.50. Interest on working capital was estimated at the rate of 7 per cent. It worked out to Rs 5705.73 & 5103.03.Depreciation on fixed capital is as Rs 800.

Since tapioca cultivation is done in own land by all respondents, rent paid for leased - in- land is excluded. Rental value of owned land was estimated as one third value of output. The imputed wages for the family labour engaged accounted to Rs 1900 per annum. Addition of total cost B and family labour wages is considered as total cost C which accounted to Rs 139254.97 & 126971.37. The average estimated yield of tapioca for Pethanayakanpalayam block is 17.430 ton/ac whereas average output price was Rs 12.33/ kg. The gross return is estimated as Rs 215911.90/acre, whereas net return of farmer was Rs. 75656.93 per acre. The average cost of production for 1 kg tuber is Rs. 7.98 and the benefit cost ratio is 1.54.

The average estimated yield of tapioca for Gangavalli block is 18.280 ton/ac whereas average output price was Rs 12.33/kg. The gross return is estimated as Rs 225392.40/acre, whereas net return of farmer was Rs. 98421.03 per acre. The average cost of production for 1 kg tuber is Rs. 6.94 and the benefit cost ratio is 1.77.

The cost of setts has a difference of Rs. 205/ac between the both blocks, the setts is available cheaply in in the Gangavalli block which has sago industries. Labours were cheap in Gangavalli block compare to Pethanayakanpalayam block the difference of the labour cost is Rs. 400/ac. Manure, fertilizers and plant protection cost Rs. 895/ac more in Pethanayakanpalayam compare to Gangavalli block.The commission earned by the brokers is Rs. 510/ac more for Pethanayakanpalayam compare to Gangavalli block. The major

Table-2. Difference of Cost and Income between Tapioca Farms of the Selected Blocks

Particulars	Salem		
	Pethanayak-anpalayam	Gangavalli	Difference of cost between the two blocks
Setts	2025	1820	**205**
Labors	6600	6200	**400**
Manures & Fertilizers	18730	17960	**770**
Plant protection	3375	3250	**125**
Transport	11900	5100	**6800**
Broker commission	1700	1190	**510**
Cost of cultivation (Rs/acre)	139254.97	126971.37	**12283.60**
Output price (Rs/kg)	12.33	12.33	**12.33**
Yield (Kg/acre)	17430	18280	**850**
Gross Income (Rs/acre)	214911.90	225392.40	**10480.50**
Net Income (Rs/acre)	**75656.93**	**98421.03**	**22764.10**
Cost of production (Rs/Kg)	**7.98**	**6.94**	**1.04**
Benefit cost ratio	**1.54**	**1.77**	**0.23**

Source: Computed based on Primary data

difference between the two blocks was found to be the transport cost which is Rs. 6800/ac more for Pethanayakanpalayam compare to Gangavalli block because the tapioca farmers of Pethanayakanpalayam has to transport longer distance compare to Gangavalli block as sago factories are located nearer to Gangavalli. The cost of cultivation has difference of Rs. 12283.60/ac between both the blocks. This difference in cost of cultivation between the blocks is due to accumulative difference in input cost, transport cost, manures, fertilizers, and plant protection cost incurred by the farmers where sago factories are located in far off place.

The yield difference between the two blocks is 850 kg/ac. The difference in gross income is Rs. 10480.50 between Pethanaya-kanpalayam and Gangavalli tapioca farmers. The net income Pethanayakanapalayam block Rs. 75656.93/ac and the net income for Gangavalli block is Rs. 98421.03/ac. The net income of tapioca farmers in Gangavalli block is Rs.22764.10/ac higher than the income of Pethanayakanpalayam tapioca farmers. The cost of production for Pethanayakanpalayam block Rs.7.98/kg and the cost of production for Gangavalli block is Rs. 6.94/kg. Farmers of Gangavalli block spend Rs. 1.04 less than the farmers of Pethanayakanpalayam block for per/kg cultivation. The BCR for Pethanayakanpalayam and Ganagavalli blocks was found to be 1.54 and 1.77 respectively.

The difference in BCR between the blocks is only 0.23.

The major finding of the study reveals that the farmers in Gangavalli block enjoy certain advantage over the farmers of Pethanayakanpalayam block in certain areas such as reduced sett cost and lesser labour cost compare to Pethanayakanpalayam block as the presence of sago factories influences labour availability and cost. The broker cost is also lesser in Gangavalli block because only few farmers go to brokers to sell the crop because majority of the farmers, they themselves take the crop to the sago factories as it is present nearer to them. The difference between the cost of production was Rs. 12283.60/ac, out of which transportation alone costs Rs. 6800/ ac. It is also found that tapioca farmers nearer to the sago factories enjoy a major advantage in production aspect but the benefit cost ratio has very less difference among the blocks because the cost of procurement is fixed for everyone in the sago industries.

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