

## An Analysis of Sapota Fruit Cultivation in Tuticorin District

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### Abstract

India now ranks first in the world in the combined production of fruits and vegetables. Out of 370 million tons of fruit production in the world, India accounts for 30 million tons. India has produced 49,360,000 t fruits and 93,000,000 t vegetables during year 2009-2010. The major fruits grown in India include mango, banana, papaya, orange, mosumbi, guava, apple, pineapple, sapota, ber, pomegranate, strawberry, litchi etc. Sapota, also known as "Chikku" in North India, being a deep rooted and drought-resistant crop has been found to be an ideal plant for two tier cropping system with chillies as an intercrop in dry areas of Tuticorin district. This paper attempts to examine cost and returns of Sapota cultivation in Tuticorin District. The present study is based on primary data covered only six months period (2014). The proportionate random sampling technique has been adopted to select 60 Sapota farmers from Vilathikulam and 60 Sapota farmers from Puthur blocks of Tuticorin district. Percentage analysis, averages, ranking method and standard deviation chi square tests and probability analysis were used for the analysis. The results from this study were found that the total cost of production was Rs.9257.10 in Vilathikulam whereas in Puthur, it amounted to Rs.6034.60. The direct cost accounted for 70.14 per cent in total cost of production in Vilathikulam whereas in Puthur it accounted for 60.48 per cent. The indirect costs accounted for 29.89 per cent of total cost of production in Vilathikulam and 39.52 per cent in Puthur. Among the components of indirect costs, interest on fixed capital formed the major item. It accounted for Rs.1327 in Vilathikulam and Rs.1259.80 in Puthur. The other components of indirect cost included, annual share of establishment cost, depreciation and interest on working capital and they accounted for 3.44 per cent, 4.49 per cent and 7.59 per cent respectively in Vilathikulam and 4.83 per cent, 5.31 per cent and 8.51 per cent respectively in Puthur. Thus, it could be concluded that investment in Sapota orchard was economically feasible and financially viable in both the blocks.

**Keywords:** Agriculture; Orchard; Horticulture; Intercrop; Indirect Cost; Depreciation

### Introduction

India is endowed with wide agro climatic conditions that offer immense scope for cultivation of various kinds of fruit crops. This provides an excellent platform for the country to emerge as a leading producer of fruit crop. The horticulture scenario of the country is rapidly changing. The production and productivity of horticulture crop have increased manifold. It is the fastest growing sector within agriculture thanks to the economic prosperity that has provoked market changes in the life styles and the consumption habits. Increase in area allocation under horticultural crops has often been suggested as a measure for agricultural diversification, increased employment and income.

India now ranks first in the world in the combined production of fruits and vegetables. Out of 370 million tons of fruit production in the world, India accounts for 30 million tons [1]. India has produced 49,360,000 t fruits and 93,000,000 t vegetables during year 2009-2010. The major fruits grown in India include mango, banana, papaya, orange, mosumbi, guava, apple, pineapple, sapota, ber, pomegranate, strawberry, litchi etc. [2].

Sapota (*Achras sapota* Linn.) belongs to family Sapotaceae, and is one of the major fruit crops in India, Mexico, Guatemala and Venezuela. Sapota fruit is reported to contain sugars [3], acids [4], protein, amino acids [5], phenolics, viz., gallic acid, catechin,

chlorogenic acid, leucodelphinidin, leucocyanidin and leucopelargonidin [6], carotenoids, ascorbic acid, and minerals like potassium, calcium and iron [5].

India is the largest producer of Sapota followed by Mexico, Guatemala and Venezuela. Area under Sapota in India is estimated to be 1.40 lakh hectares, with an annual production of 11.17 lakh tonnes ([www.apeda.com](http://www.apeda.com)). India has about 162 thousand hectares of land under cultivation of Sapota and produces about 1358 thousand tonnes of Sapota per year [7].

Sapota fruits are used for making jams, jellies, osmodehydrated slices and squash [8]. Products like sweet chutney, dried sapota pieces, sapota milk shake, nectar, blended sapota drinks, pickle, preserve and candy can also be prepared with good sensory quality [9]. Even wine can be prepared from Sapota fruit [10]. Sapota, also known as "Chikku" in North India, being a deep rooted and drought-resistant crop has been found to be an ideal plant for two tier cropping system with chillies as an intercrop in dry areas of Tuticorin district. This paper attempts to examine cost and returns of Sapota cultivation in Tuticorin District.

### Objectives of the Present Study

The objectives of the present study are:

1. To collect data on the socio-economic structure of Sapota cultivators in Tuticorin District.

Variable	Categories	Vilathikulam block (n=60)	Puthur block (n=60)
		Percentage	Percentage
Sex	Male	62	59
	Female	38	41
Age	Young (15-30)	21	28
	Middle (30-45)	48	46
	Old (45-60)	26	24
	Above-60	5	2
Education	Illiterate	9	7
	Primary	26	28
	Secondary	18	19
	Hr. Sec	36	38
	Graduate	11	8
Family Size	Less than 3	14	12
	Low (3-6)	60	62
	Medium (6-9)	18	20
	Large (9-12)	8	6
Family Type	Nuclear Family	88	92
	Joint Family	12	8
Marital Status	Married	94	84
	Unmarried	6	16
Land Holdings	Small Farmers	62	68
	Medium Farmers	28	24
	Large Farmers	10	8
Livestock	Goat	14	28
	sheep	52	14
	Cattle	6	22
	buffaloes	28	36
Occupation	Landless labour	9	6
	Agriculture	57	62
	Agriculture+ allied	34	32
Experience in years	Below 5	40	28
	5-10	14	18
	10-15	19	10
	Above 15	27	44

**Table 1:** Socio-Personal Characteristics of Respondents. Source: Survey Data.

1. To identify the cost and returns of Sapota cultivation in Tuticorin District.
2. To study various problems of cultivation of Sapota in the study area.

### Methodology

The present study is based on primary data covered only six months period (2014). Primary data has been collected through interview schedule. The total household sample is 120. The proportionate random sampling technique has been adopted to select 60 Sapota farmers from Vilathikulam and 60 Sapota farmers from Puthur blocks of Tuticorin district. A separate interview schedule was designed, pilot tested and used for data collection. This is purely a descriptive study. Percentage analysis, averages, ranking method and standard deviation chi square tests and probability analysis were used for the analysis.

### Discussion and Analysis

The information on Sapota cultivation was collected by survey method through personal interview with the sample farmers, confined to a particular area. The present study has covered Tuticorin District. The study area has about 334 acres under Sapota cultivation though effective area is only 282-319 acres. There were 306 farmers cultivating Sapota. Due to lack of money, energy and lack of time, the researcher has collected the data from 120 respondents in the study area for the purpose of analysis and discussion (Table 1).

### Results and Discussion

The socio-economic characteristics of sample Sapota cultivating farmers from Vilathikulam and Puthur blocks of Tuticorin district were analyzed and presented in the above table. It is evident from the results that in Vilathikulam block the percentage of male is more i.e., 62% and in Puthur block it was also more i.e., 59%.

In case of Vilathikulam block the percentage of middle age respondents is more i.e., 48% and in Puthur block it was also more i.e., 46%. As per the survey middle age group's involvements is higher than that of old and young aged groups and mean size of the family worked out to be 40.01 years in Vilathikulam block and 39.52 years in Puthur block of the study area.

Further, results revealed that in Vilathikulam block 26% of the respondents had primary education, about 18% had high school education, about 36% possessed higher secondary level education and only about 11% had pursued degrees. Further, 9% remained illiterate. In Puthur block 28% of the respondents had primary education, about 19% had high school education, about 38% possessed higher secondary level education and only about 8% had pursued degrees. Further, 7% remained illiterate.

Results on family size categories indicate that in Vilathikulam block majority of the respondents i.e., 60 percentage of families are having less than 6 size ranging from members and mean size of the family worked out to be 4.73 years. In case of Puthur block it was 62 percentage and mean size of the family worked out to be 4.21 years.

Results on family type in Vilathikulam block revealed that 88 percent of the respondents belonging to the nuclear family and in Puthur block it were 92%. This clearly indicates the declining of the joint family system. Table shows that a considerable number of the farmers are married. They constitute 94 per cent of the sample and the

rest 6 per cent are unmarried in Vilathikulam block and in Puthur block 84 per cent of the sample farmers are married and the rest 16 per cent are unmarried.

Results on land holding in Vilathikulam and Puthur block revealed that the number of small farmers forms the majority (62% and 68%). The next bigger group is the medium farmers (28% and 24%). The numbers of large farmers are quite few (10% and 8%) and mean and standard deviation of Vilathikulam farmers worked out to be 16.67 and 14.57 and in Puthur block mean and standard deviation of land holding worked out to be 16.93 and 14.07 respectively in the study area.

Further, results revealed that cattle, goat, sheep and buffaloes are the major livestock in the area. In Vilathikulam block about 14% of the sample farmers had goat, about 28% of them maintained buffaloes, about 52% of them sustained sheep and about only 6% of them had cattle. Poultry is widely prevalent in the villages. On the contrary in Puthur block about 28% of the sample farmers had goat, about 36% of them maintained buffaloes, about 14% of them keep up sheep and about 22% of them had cattle.

The table revealed that in Vilathikulam and Puthur block 57% and 62% of the respondents engaged in agriculture as a prime occupation, 34 % and 32% of the farmers were committed in agriculture and allied sector as their occupation and while the landless are almost insignificant (9% and 6%).

The above table reveals that in Vilathikulam and Puthur block a considerable number of farmers that is 40 and 28 per cent of them, have less than 5 years of experience and 14 and 18 per cent have 5-10 years of experience. The rest i.e.19 per cent and 27 per cent in Vilathikulam block have 10-15 and above 15 years of experience and in Puthur block 10 per cent and 44 per cent have 10-15 and above 15 years of experience respectively.

Factors	Chi-Square Value	Result
Age	12.51	Significant**
Educational Qualification	14.93	Significant**
Family Size	4.26	Not Significant
Marital Status	7.94	Significant*
Occupational Status	6.21	Not Significant
Experience	13.86	Significant*

**Table 2:** The Summary of Opinion of the Sapota Cultivator. Source: Compiled from Primary Data.

The opinion of the respondents and socio-economic characters relationship is applied for chi square test. The selected variables only applied in this model. Table 2 reveals that the summary of the respondents. The chi-square analysis reveals that the factors are Age and Education are significant at 1% level. Marital Status and Experience are significant at 5% level of significance. The remaining factors are not significant at 5% level.

It could be seen from the above Table 3 that the total cost of production was Rs.9257.10 in Vilathikulam whereas in Puthur, it amounted to Rs.6034.60. The direct cost accounted for 70.14 per cent in total cost of production in Vilathikulam whereas in Puthur it accounted for 60.48 per cent. The indirect costs accounted for 29.89

per cent of total cost of production in Vilathikulam and 39.52 per cent in Puthur.

Cost Components	Vilathikulam block		Puthur block	
	In Rs.	Percent	In Rs.	Percent
Direct Cost:				
Operation and Maintenance cost	6492.50	70.14	3649.50	60.48
Indirect Cost:				
Annual share of establishment cost	318.60	3.44	291.50	4.83
Depreciation	415.50	4.49	320.50	5.31
Interest on fixed capital	1327.00	14.32	1259.80	20.88
Interest on working capital	703.50	7.59	513.30	8.51
Total	2764.60	29.89	2385.10	39.52
Total cost	9257.10	100.00	6034.60	100.00

**Table 3:** Cost of production of sapota per acre in vilathikulam and puthur block in tuticorin district. Source: Survey Data.

Among the components of indirect costs, interest on fixed capital formed the major item. It accounted for Rs.1327 in Vilathikulam and Rs.1259.80 in Puthur. The other components of indirect cost included, annual share of establishment cost, depreciation and interest on working capital and they accounted for 3.44 per cent, 4.49 per cent and 7.59 per cent respectively in Vilathikulam and 4.83 per cent, 5.31 per cent and 8.51 per cent respectively in Puthur.

Cost And Returns (Rupees / Acre)	Vilathikulam block	Puthur block
Gross Return	34953.20	21029.50
Total Cost of Cultivation	9257.10	6034.60
Net Return over Cost of Cultivation	25696.10	14994.90

**Table 4:** Cost and returns of sapota (rupees/acre). Source: Survey Data.

Net return that is cost of production over gross return was Rs. 25696.10 in Vilathikulam and it was Rs.14994.90 in Puthur (Table 4). Yield per acre in money term was Rs.34953.20 in Vilathikulam and Rs. 21029.50 in Puthur. Net return figures also show a higher in Vilathikulam compared to Puthur.

Factors	Vilathikulam block		Puthur block	
	Mean Score	Rank	Mean Score	Rank
Needs heavy investment	57.14	I	46.97	II
Pest and disease	49.03	II	61.27	I
Climate Factors	36.24	III	41.65	III
Long gestation period	28.46	IV	32.69	V
Inadequate credit facilities	19.83	V	27.09	IV

**Table 5:** Production Problems in Sapota Cultivation. Source: Computed from Survey Data.

The Sapota cultivators identified five major problems of Sapota production and they were ranked by using Garret's scoring technique (Table 5). A perusal of the table shows that the orchardists encountered with five problems for production of Sapota. In Vilathikulam block, the most important problems in the production of Sapota were heavy investments, pest and disease and climatic factors which were ranked as first, second and third respectively. Long gestation period and inadequate credit facilities were ranked fourth and fifth. In Puthur block, it was clear from the analysis that the most important factor which severely affected mango production was the pest and disease, needs heavy investment and climate factors which were ranked 1st, 2nd and 3rd places. Inadequate credit facilities and Long gestation period were ranked fourth and fifth respectively.

### Conclusion

The study has revealed that the major source of earning of farmers in the study area was agriculture. This fruit has been found to give a higher return to the farmers. Based on the results of the present study it is concluded that there is a need for adequate attention towards mitigating various constraints for overall development of Sapota cultivation which has occupied a major place in cropping system in the study area, so as to improve the economic level of the rural people by providing employment. Thus, it could be concluded that investment in Sapota orchard was economically feasible and financially viable in both the blocks.

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