Cost and Returns of Banana Cultivation in Tamil Nadu with Special Reference to Karur District

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The study aims to find the effect of fixed cost and variable cost on banana production and also to find the return to scales of farmers. Agricultural is a predominant occupation in Karur District and it occupies an important place in the District economy. Karur District was selected for the present study since the banana cultivation occupied first place in agriculture in this district. Primary data required for the study were collected for the 500 selected respondents of Karur District in order to analyse the technical efficiency of the farmers. The field survey was carried out during the period 2004. To find out input and output relationship (Returns to scale) the Cobb- Duggles function production function has been used. Cobb-Doughlas function was applied to find the effect of fixed cost and variable cost on banana production and also to find the return to scales of farmers. On the basis of the study concluded the agricultural growth strategy of the past has intensified the interclass inequalities. Except the imputed value of family labour, the other things like cost of production, overall returns etc., are not favourable to the small farmers.

Introduction

India is one of the world's largest producers of farm commodities, and the second largest producer of fruits and vegetables. Agriculture accounts for about 14.7 percent of the country's total export earnings. It also has one of the world's largest agricultural research systems and relatively well-developed base for research and development and extension. In past four decades, India has become self sufficient in food grains and now has a surplus. Food grain production increased from 89.4 million tonne in 1964-1965 to 211.3 million tonne in 2001-2002 with dissemination and adoption of green revolution technology. In India fruits are grown extensively both as dry crop and wet crop. Mango, banana, guava, citrus, apple, pineapple, papaya, litchi and other indigenous fruits are popular having perennial demand throughout the year.

Banana is one of the oldest fruits cultivated by man from pre-historic times and is known for its antiquity dating back to 2500 B.C. Banana belongs to the family

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musaceae Under the order *scitaminae* with two genera namely *Musa* and *Ensete. Musa*, originated from Indo-China and South East Asia has commercial significance. Banana is the most important fruit crop in India and has greater socio-economic significance accounting for 31.7 percent of total fruit production. Owing to its multifaced uses and high economic returns it is referred to as **"Kalpatharu"** (a plant of virtues) [2].

A large number of varieties of banana are grown in India such as Cavendish, Pome, Poovan, Nendran, Rasthali, Bluggoe and others. Robusta and Moris banana belong to Cavendish variety. They are very popular in South India.

Review of Literature

O.P.Maurya, G.N. Singh and R.K.S. Kushwaha (1996)[3] estimated that the cost of cultivation of banana was reported to be Rs.20,160.7 per hectare, cost of human labour about 37.40%, cost on manures and fertilizers 32.37%, overhead cost 7.41%, bullock labour 6.63% seed (suckers) 6.20%, rental value of land 4.96% plant protection 80% and irrigation 2.23%.

Arputharaj and Kesavan Nair(1986)[4] in their study, found that an average amount of Rs.36, 252 per hectare had been spent towards the cost of cultivation of plantain. The highest item of expenditure was human labour forming about 23% of the total cultivation expenses. The average output per hectare was 14,991 Kg of plantain bunches valued at Rs.56,205.

Latha Bastine and Radhakrishnan (1988)[5] in their study on economics of plantain cultivation in Kerala found that the cost of cultivation per hectare was Rs.36,249. The returns worked out to be Rs.45,068 and the main items of expenditure were cost of the family and hired labour and manure per hectare of plantain cultivation. The study illustrated that the contribution of family labour was 30.50 percent of the total expenditure for labour. The contribution of family labour showed a decreasing trend as the size of holding increased.

Samban (1991)[6] in his study on economics of banana cultivation in Tiruchirapalli District of Tamilnadu used the Cobb-Douglas production function to assess the efficiency of inputs and the plantain yield which was influenced by size of land, sucker and supporting poles that had shown diminishing marginal returns to their application. The return to scale of production of plantain was the operation of diminishing return to scale that is one percent in the yield of plantain. There was more scope for further application of land and supporting poles and there was a case for reduction in the use of suckers in the cultivation of plantain in the study block.

Tewari and Sharma (1986)[7] assessed the impact of technical change in terms of significant differences in input-output relationship on different types of farms. They computed the cost and returns at the farm level for the project and non-project area farms to compare the resources used efficiency for the different inputs used and the gross income realized in the two areas.

objectives of the Study

1. To analyse the cost and returns of banana cultivation.
2. To offer suggestions to improve the production and Returns of banana.

Methodology

Research Design

The study is a combination of both descriptive and analytical.

Sampling Design

The present study is empirical and hence field survey method and personal interview technique were adopted. Multi-stage stratified random sampling has been adopted for the present study with Karur District as the universe, the taluk as the stratum, the village as the primary unit of sampling and the banana farmers as the ultimate unit.

Sample frame work in Karur District

S.No.	District	Taluk	Villages	Small Farmers	Medium Farmers	Large Farmers	Total
1.	KARUR	Kulithalai	all villages	163	62	25	250
		Krishnaraya puram	all villages	160	71	19	250
	TOTAL			323	133	44	500

Source: Compiled by the researcher.

Collection of Primary Data

Primary data required for the study were collected from the selected respondents of Karur district in order to analyze the technical efficiency of the farmers.

Period of Study

The field survey was carried out during the period from April 2004 to August 2004 to collect the primary data.

Statistical Tools

Cobb- Duggles function

To find out input and output relationship (Returns to scale) the CD production function has been used.

Measurement of variables

a. Small farmer : Farmers having land upto 2.50 acres

b. Medium farmer: Farmers having land from 2.51 acres to 5.00 acres

c. Large farmer: Farmers having land more than 5.00 acres

Cost

The cost relates to cost of cultivation of banana. The items that constitute the cost of cultivation are suckers, manures, fertilizers, hired human labour, interest on working capital, rental value of land, operational and maintenance cost of banana cultivation per acre were calculated. Theses expenses are very necessary to banana production .

Estimation of Cost: Different ways / means

Cost A: Variable Cost

Hired Human Labour + Suckers + Natural Manures + Fertilizers + Pesticides + irrigation charges + Depreciation charges + Interest on working capital.

Cost B: Fixed Cost

Operational Holding – Rental Value + Interest on Fixed Capital

Total Cost

The total cost is calculated by adding the following three items namely, Cost A, Cost B and imputed value of family labour.

Returns

Banana bunches is considered to be the main source of income for banana cultivators. The yielding period of a banana tree is upto three years. The additional income also available in the cultivation of banana viz., Sale of Sucker, Banana flowers, Dry leaves and Banana leaves.

Net Income

Net Income is calculated by the following ways:

Total Cost – Returns = Net Income

AVERAGE TOTAL COST			
LAND HOLDINGS	**Mean (Rs.)**	**N**	**Std. Deviation (Rs.)**
Small farmers	60132.1752	323	3627.6126
Medium farmers	62521.4436	133	4706.3746
Large farmers	66404.3750	44	9684.2873
Total	61319.6742	500	5100.0215

RETURN FROM BANANA CULTIVATION			
LAND HOLDINGS	Mean(Rs.)	N	Std. Deviation(Rs.)
Small farmers	67904.4118	323	4956.0160
Medium farmers	76741.1654	133	4732.8200
Large farmers	83618.1818	44	7501.7214
Total	71637.8000	500	7432.6410

NET INCOME			
LAND HOLDINGS	Mean(Rs.)	N	Std. Deviation(Rs.)
Small farmers	7772.2365	323	5363.2870
Medium farmers	14219.7218	133	7679.0817
Large farmers	17213.8068	44	9200.8763
Total	10318.1258	500	7341.7377

COBB-DOUGHLAS PRODUCTION FUNCTION FOR SMALL FARMERS

Cobb-Doughlas function was applied to find the effect of fixed cost and variable cost on banana production and also to find the return to scales of Small farmers.

TABLE 1

Model Summary

R	RSquare	F	TableValue	Sig.
.992	.985	10341.582	6.715	**

TABLE 1. a

CD PRODUCTION FUNCTION

	B	Std. Error	Beta	T	TableValue	Sig.
(Constant)	-3.187					
Log of (Fixed Cost)	.788	.015	.859	51.598	2.59	**
Log of (Variable Cost)	.156	.018	.144	8.670	2.59	**

** 1 % level of Significance

Source: Primary Data

The multiple correlation co efficient was found to be 0.992 which is significant at 1 % level. The CD function result shows that the effect of fixed cost and variable cost on banana production is significant at 1 % level. The return to scale is found to be 0.788+0.156= 0.944 which is less than unity. This indicates that the small farmers have **decreasing returns to scale** for banana production for fixed cost and variable cost inputs.

COBB-DOUGHLAS PRODUCTION FUNCTION FOR MEDIUM FARMERS

Cobb-Doughlas function was applied to find the effect of fixed cost and variable cost on banana production and also to find the returns to scales of Medium farmers.

TABLE 2

Model Summary

R	RSquare	F	TableValue	Sig.
.991	.983	3703.694	6.834	**

TABLE 2. a

CD PRODUCTION FUNCTION

	B	Std. Error	Beta	T	TableValue	Sig.
(Constant)	-4.111					
Log of (Fixed Cost)	.822	.037	.805	22.384	2.614	**
Log of (Variable Cost)	.203	.038	.194	5.399	2.614	**

** 1 % level of Significance

Source: Primary Data

The multiple correlation co efficient was found to be 0.991 which is significant at 1% level. The CD function result shows that the effect of fixed cost and variable cost on banana production is significant at 1% level. The return to scale is found to be 0.822+0.203= 1.025 which is higher than unity. This indicates that the medium farmers have **increasing returns to scale** for banana production for fixed cost and variable cost inputs.

COBB-DOUGHLAS PRODUCTION FUNCTION FOR LARGE FARMERS

Cobb-Doughlas function was applied to find the effect of fixed cost and variable cost on banana production and also to find the returns to scales of Large farmers.

TABLE 3

Model Summary

R	RSquare	F	TableValue	Sig.
.984	.968	615.07	7.296	**

TABLE 3. a

CD PRODUCTION FUNCTION

	B	Std. Error	Beta	T	TableValue	Sig.
(Constant)	-1.615					
Log of (Fixed Cost)	.628	.110	.515	5.709	2.701	**
Log of (Variable Cost)	.403	.112	.474	3.584	2.701	**

** 1 % level of Significance

Source: Primary Data

The multiple correlation co efficient was found to be 0.984 which is significant at 1 % level. The CD function result shows that the effect of fixed cost and variable cost on banana production is significant at 1 % level. The return to scale is found to be 0.628+0.403= 1.031 which is higher than unity. This indicates that the large farmers have **increasing returns to scale** for banana production for fixed cost and variable cost inputs.

Findings and Suggesstions of the Study

1.COBB - DOUGHLAS PRODUCTION FUNCTION FOR THE SMALL FARMERS

This indicates that the small farmers have decreasing returns to scale for banana production for fixed cost and variable cost inputs. (Table 1.a)

2.COBB - DOUGHLAS PRODUCTION FUNCTION FOR THE MEDIUM FARMERS

This indicates that the medium farmers have increasing returns to scale for banana production for fixed cost and variable cost inputs. (Table 2.a)

3.COBB - DOUGHLAS PRODUCTION FUNCTION FOR THE LARGE FARMERS

This indicates that the large farmers have increasing returns to scale for banana production for fixed cost and variable cost inputs. (Table 3.a)

- The size of the farm holdings has a direct effect on the output of bananas. Sub-divisions and fragmentation of the farms leading to uneconomic holdings result in lower output. Necessary steps should be taken to consolidate the smallholdings of the farmers to make the agricultural holdings more economic so that it will increase the output. The uneconomic holdings may be converted into economic holdings through Co-operative farming.

- Since the availability of water is insufficient, the purchase of water from fellow farmers is inadequate. As a result there is a sizable reduction in the output. In order to increase the water resources, the Government should come forward to help the farmers through subsidy for digging well or bore well.

- The study indicated that the cost of production of banana is high. Among the cost, the cost of labour and fertilizer is more. If the farmers undertake subsidiary occupations like dairying, natural manures, dung etc., that can be used for banana cultivation.

- The non-availability of quality suckers is a problem for the farmers. The Government should encourage the farmers for more production and productivity high breed-suckers, fertilizers and pesticides at subsidized rates and assure a good market for banana.

- The output of banana much depends upon the maintenance of banana plants. The timely application of water, manure, pesticides and fertilizers are required for higher output. An awareness is to be created among the farmers especially the small and medium through bringing these techniques to their door steps.

- The cost of fertilizers and pesticides is more as the farmers buy them from private traders. The Government should comeforward to supply them through agricultural co-operative organsations either as subsidies or at reasonable price.

- The farmers are usually following traditional methods of cultivation through generations. The advance techniques like soil testing and seed testing are not used by the farmers as they are not aware of them. Therefore, the laboratories for these tests are to be established atleast at every panchayat union level of Karur district.

- The farmers should be encouraged to follow intercrop cultivation as it is not only increases the total income but also the intercrops are used for natural manure.

- During the period of non-availability or inadequacy of water, the lands are kept uncultivated. The farmers should be educated to undertake crop diversification.

- The official of the horticultural department at the taluk levels should visit the farms and give their suggestions to the banana farmers to overcome their problems regarding the availability of hybrid seeds, pest management, water management, use of manures and fertilizers and increased production.

Conclusion

The agricultural growth strategy of the past has intensified the interclass inequalities. Except the imputed value of family labour, the other things like cost of production, overall returns etc., are not favourable to the small farmers. This should be considered by the Government. The Government can pay attention by providing transport facilities, maintaining good roads and providing subsidies for suckers and fertilizers, so that the small and medium farmers may be benefited. The Government can take necessary steps to release Cauvery water at appropriate period (i.e. during banana cultivation period), which will enable the farmers to get a good yield of banana.

In the areas chosen for the research, two-third of the population are agriculturists. Their agricultural lands depend on monsoon rains. The majority of the lands are rain-fed areas. If the monsoon fails, then the farmers will be in trouble. In this situation, the Government should give financial support to farmers, especially to the small and medium farmers. The crop insurance is one of the measures suggested that has to be extended to all the farmers. Steps should be taken to reduce the losses arising out of high moisture content of the banana. The banana is also seriously affected by various diseases. Therefore, a permanent research station may be set up to protect the banana from disease.

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