Cost of Cultivation of Different Varieties of Banana Cultivated in Tirupattur Taluk of Vellore District

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Abstract

Banana is a major food crop and an essential source of income for several households in the country. However, the production of different varieties of bananas has shown variation in terms of area, production and productivity since 1991. To find out the reasons of this situation, this study has been conducted to investigate the factors affecting the production of different varieties of banana in Tirupattur taluk of Vellore District in Tamil Nadu. In this study the special focus was on the cost incurred on different process of cultivation and its impact on production and returns. A well structured questionnaire was framed and data related to the study was collected from the sample respondents. The collected data was then analyzed using SPSS and the inferences were drawn accordingly. The results of the study show that the cost of cultivation has got greater influence in the overall production. While using the regression analysis the regression coefficients explicitly depicts that cost incurred on preparation of land, cost incurred on fertilizers and cost incurred on fertilizers have more impact when compared to other costs. There is also a high level of positive correlation between the sizes of land area under cultivation to that of total production in the study area. Based on the positive aspects the government should emphasize on, in order to increase the production of different varieties of banana in Tirupattur taluk. On the other hand this study has not covered the whole area of Vellore district. Further researches are needed in order to provide more information to the farmers who would like to invest in bananas cultivation in different parts of the district, state and the country as a whole.

Keywords: cost of cultivation, varieties of banana, regression and correlation.

Introduction

Banana and plantains, are continuously exhibiting a spectacular growth in terms of area, production and productivity in India. India alone produces nearly 27.01 million tons from an area of 0.765 million hectares in 2011. India is the largest producer of banana in the world and also in Asia. The major banana growing states in India are Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, Maharashtra, Orissa and West Bengal. India is credited as the largest producer of banana and in the last two decades it has witnessed an increasing trend recording high growth rate, which has been possible due to the adoption of improved production technologies like high density planting, use in-virto plants, fretigation and management of insect pest and disease.

Banana in Tamil Nadu

Tamil Nadu has the largest area under banana where it is cultivated in about 83,000 hectares with an annual production of 27.82 lakh tons. It is also called as Kalpatharu (a plant of virtues) because of its high returns.

Table 1: Banana, Area, Production of Yield in Tamil Nadu (1999-2000 to 2010-2011)

Year	Area in hectares	Production in tons	Yield in kg/ha
1999-2000	85122	3132240	36797
2000-2001	82767	3069540	37086
2001-2002	84542	3543796	41918
2002-2003	76771	2836916	36953
2003-2004	71088	2514729	35375
2004-2005	81498	3461788	42477
2005-2006	94648	4647635	49104
2006-2007	105206	5151394	48965
2007-2008	112793	5384825	47741
2008-2009	115804	5148134	44453
2009-2010	113681	4887841	42996
2010-2011	107394	4800472	44700

Source: Compiled from season and crop reports Tamil Nadu, Department of Economics and Statistics. (1999-2000 to 2010-2011)

It is clear from Table 1 that it is an encouraging fact there is an increasing trend in the overall area, production and yield for a period of 12 years. Till 2005 there were fluctuations in area under banana cultivation because of frequent monsoon failures, increase in cost of inputs and shifting to other crops in search of higher returns. But after 2005 there was a steady increase in the area under banana cultivation and also a steady increase in the production and productivity of banana. The reasons for increase in production and productivity are improved seed technology, better irrigation facilities, better price in the markets, increasing demand in the international markets, etc. Vellore district is famous for its varietal cultivation of banana and other crops. This area is filled with high agricultural potential and fertility of the soil is good and farmers expect high yield in their growing seasons.

The Importance of study

Banana is one of the oldest fruits cultivated across the world in varying proportions and it has got great significance in terms socio-economic conditions of mankind. Banana has got high nutritional value which is indeed highly needed for the people living in the society. Since banana is cultivated in different parts of India and Tamil Nadu is one state where banana is cultivated in an extensive manner. Among the 32 districts including Chennai, banana is cultivated in larger proportion in Vellore District. In Vellore district different varieties of banana are cultivated under varying proportions. The major varieties cultivated in this district are *Poovam, Yelakki,*

Karpuram, Pachai, Kattu and *Rasthali*. The other varieties like *Nendram, Sevvazhai*, etc are cultivated in limited area. Since banana crop is subjected to pest attacks it is necessary to protect the crop. Integrated pest management and disease management technology have to be developed for an effective, eco-friendly management of major pests and diseases for increasing production and productivity of banana in the study area.

Statement of the Problem

Banana is a universal crop cultivated all over the world under varying proportions. There are different varieties of banana cultivated in different parts of the world. The soil, weather conditions and other factors are likely to influence the production and productivity of banana. The rising cost of cultivation is a major issue in terms of any crop cultivated under irrigated and rainfed conditions. Banana which is cultivated under proper irrigation conditions needs to be paid more attention when it is cultivated under rainfed conditions.

Every farmer who is cultivating banana faces many problems which he has to undergo during the process of cultivation. The study area is considered to be a rainfed area and more of rainfed crops are cultivated. Under such conditions an attempt is made to study the different varieties of banana cultivated by some of the selected farmers cultivating banana in Tirupattur taluk of Vellore district. Keeping in view of all the above stated conditions this study tries to measure the extent of different varieties of banana cultivated in Tirupattur taluk, of selected farmers and the constraints faced by these farmers during their cultivation process and also to suggest possible measures to increase the level of production and productivity in the study area.

Objectives of the Study

- To study the different varieties of banana cultivated in the study area.
- To analyze the impact of cost of cultivation on production of different varieties of banana.
- To offer valuable suggestions to enhance banana cultivation in the study area.

Hypotheses

- The cost of cultivation in different varieties of banana has got greater impact on the level of production
- There exists significant relationship between the different varieties of banana cultivated to that of land area under cultivation.

Methodology

The study was conducted in Tirupattur taluk of Vellore district in Tamil Nadu. The district consists of 9 Taluks and 20 Blocks and it has been divided into seven agricultural divisions. Among these 9 Taluks, Tirupattur Taluk is one of the important area where banana is cultivated in an extensive manner. The data was collected from farmers who cultivated different varieties of banana in Tirupattur taluk during May 2013. The proportionate random sampling technique was

adopted to select the sample size. A sample of 120 farmers was selected from 12 villages of Tirupattur block were banana cultivation was done in a more intensified manner. Personal interview method was followed to collect data from sample farmers. There were about six varieties of banana identified among the selected samples of the study, namely *(poovazhai, karpuravazhai, yelakki, pachaivazhai, rastali and kattuvazhai).* From the survey, data on input-wise costs on land preparation, plantlets, manures, fertilizers, pesticides and labour cost and the value of output were calculated. The market prices prevailing during the period of survey for various items were considered for estimation of cost and returns.

$$Y = a\ X_1^{b1}\ X_2^{b2}\ X_3^{b3} X_4^{b4}\ X_5^{b5}\ X_6^{b6}\ e^u$$

Y = Production (in quintals /acre)
a = Constant or intercept term
X_1 = Cost on preparation of land (in ₹ /acre)
X_2 = Cost on plantlets (in ₹ /acre)
X_3 = Cost on manures (in ₹ /acre)
X_4 = Cost of fertilizers (in ₹ /acre)
X_5 = Cost on pesticides (in ₹ /acre)
X_6 = Cost on labour (in ₹ /acre)
e^u = Error term
$b_1 \ldots . b_6$ = Coefficients of respective variables to be estimated

Secondary data was collected from the Government of Tamil Nadu Publications from their respective years. The collected data was analyzed using SPSS and results obtained are interpreted at the appropriated places.

Analysis and Interpretation

The collected data from the sample farmers cultivating different varieties of banana produced in Tirupattur block of Vellore district were analyzed. In this research work the researcher has made an attempt to study the production, income, cost of cultivation, net returns and the possible problems encountered by the farmers while cultivating different varieties of banana in the study area and to offer suggestions for better cultivation of banana. Cost of cultivation plays an important role in the decision making of the farmer in the entire process of cultivation. Hence an attempt is made to study the impact of cost incurred on different concepts to that of the production of different varieties of banana cultivated in the study area.

Table 2: Number of farmers cultivating different varieties of banana

Varieties of Banana	Frequency	Percentage
Poovazlai	12	10.0

Karpuravazlai	11	9.2
Rasthali	9	7.5
Yelakki	34	28.3
Pachavazlai	33	27.5
Kattuvazhai	21	17.5
Total	120	100.0

Source: Primary data

The above Table 2 depicts the picture of the selected farmers cultivating different varieties of banana. The results show that more number of farmers was cultivating *Yelakki* and *Pachavazhai* and they constitute nearly 56% of the total sample of 120 farmers. These two varieties are more preferred by the people of Vellore district because of its taste and health benefits. *Yelakki* variety is more liked by the children and even some of the Doctors prescribe to eat more bananas for various medical reasons. But in case of other varieties, the price of the fruit is bit costlier and less preferred by the common people because of which the farmers are little reluctant to cultivate these varieties.

Table 3: Regression Model Summary

Model Summary[b]							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	.929[a]	.863	.855	263.990	1.618	118.304	.000[b]
a. Predictors: (Constant), Cost incurred on Labour, Cost incurred on manures, Cost incurred on preparation of land, Cost incurred on Pesticides, Cost incurred on fertilizers, Cost incurred on plantlets							
b. Dependent Variable: Production of different varieties							

The above Table 3 explains about the model summary of the regression estimates. It is clear from the above that the R^2 value which represents the relationship between the dependent and independent variables. The R^2 value (0.863) represents that these independent variables are good fitting of 86.3 percent of cost incurred on production activities of different varieties of banana cultivated in the study area. The F value (118.304) shows that the level of significance is quite fitting and good for the whole model. The Durbin-Watson statistics (1.618) indicated that there is no first order autocorrelation (either positive or negative) for the value is much near to the optimal threshold.

Table 4: Regression Coefficients

Coefficients[a]				
	Unstandardized Coefficients	Standardized Coefficients		

	B	Std. Error	Beta	t	Sig.
(Constant)	176.651	44.542		3.966	.000
Cost incurred on preparation of land	.032	.010	.202	3.053	.003**
Cost incurred on plantlets	.021	.013	.261	1.579	.117
Cost incurred on manures	.092	.043	.150	2.131	.035*
Cost incurred on fertilizers	.078	.037	.251	2.132	.035*
Cost incurred on Pesticides	.056	.057	.089	.970	.334
Cost incurred on Labour	.004	.013	.052	.301	.764
a. Dependent Variable: Production of different varieties					

** 1 percent level of significance * 5 percent level of significance

The results of the above Table 4 show the calculated regression coefficients estimator of independent variables to that of the dependent variable. As per the model the dependent variable is production of different varieties of banana in the study area and the independent variables are the different cost incurred in the process of production. The cost is divided into six categories i.e. cost incurred on preparation of land, cost on saplings, cost on manures, cost on fertilizers, cost on pesticides and cost incurred on labour. Here an attempt is made to identify the statistical significance of these independent variables to that of the independent variable. It is found that cost incurred on preparation of land has got more impact in the production of banana to that of 1 percent level of significance where as cost incurred on manures and cost incurred on fertilizers has also got positive impact on the production of banana at 5 percent level of significance. On the other hand cost incurred on pesticides, cost incurred on plantlets and cost incurred on labour has got less but positive impact on the production of banana in the study area. Thus the overall model exhibits that the cost incurred on different activities during the production process has got to play a vital role in enhancing the overall production of different varieties of banana cultivated in the study area. The coefficient of cost incurred on preparation of land is 0.202 which means that every unit increase in cost on preparation of land 20 percent increase in the production is predicted holding all the other variables constant. In the same way the coefficient of all other independent variables reflect on the same.

In order to find the relationship that exists between the land area under cultivation to that of production of different varieties of banana cultivated in the study area correlation was applied. Table 5 presents the results of the correlation between the two variables. The results show that there is a high positive correlation of 0.764 and it is statistically significant. From the result it can be understood that if a famer increases the land area there is possibility of increase in the production to that of 76 %, provided all other things remain same.

Table 5: Correlation between the productions of different varieties of banana to that of Land area under cultivation

Correlation

			Production of different varieties	Land Area under Cultivation
Spearman's rho	Production of different varieties	Correlation Coefficient	1.000	.764**
		Sig. (2-tailed)	.	.000
		N	120	120
	Land Area under Cultivation	Correlation Coefficient	.764**	1.000
		Sig. (2-tailed)	.000	.
		N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).				

Suggestions

- Inputs should be available at low cost and distributed through the cooperative societies
- High yielding hybrid varieties of plantlets
- Timely Financial assistance
- Pest control measures
- Government participation in fixation of price, market facilities and introducing new schemes
- Measures to overcome the problem of water scarcity and inadequacy of labour

Limitations

- The study is limited to some of the selected farmers cultivating banana in Tirupattur taluk. Hence the results obtained from the study are applied only to this region.
- Since the farmers provided information from their memory and no record of evidence was there and based on the oral information collected by the researcher the study was carried out and the chances of bias are always present.
- This study limits to only few of the different varieties of banana grown in Vellore district.

Conclusion

Majority of farmers cultivating banana had agriculture as their main source of income. Banana is one such crop which is subject to high risk of disease and pest attacks. It is such type of crop where it needs more water supply and difficult to cultivate under rainfed conditions. Since the study area is a rainfed area proper care must be taken while cultivating different varieties of banana with the limited resources. In this study, the data on the socio-economic conditions and the cost of cultivation of the selected farmers cultivating different varieties of banana were collected and analyzed using appropriate statistical tool. The results state that production could be enhanced when cost of cultivation can be minimized to greater extent and more land area under cultivation can be brought in.

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