Cost and Return in Vanilla Cultivation - A Study With Special Reference To Coimbatore District

** K. Mahalakshmi,*

INTRODUCTION

India is known the world over as "The Home of Spices" because it has a worldwide reputation as the only country which produces almost all kinds of spices. Vanilla is the second most expensive spice, which is traded in the international market next to saffron. Vanilla is the tropical orchid, which is cultivated for its pleasant flavour. Vanilla is the most favourable flavour in the world, which is used for the preparation of ice creams, milkshakes, beverages and the like and also used in pharmaceutical and perfumery industries. Vanillin is the source of fragrance and flavour of Vanilla. It is extracted from the beans of Vanilla.

The major vanilla producing countries are Madagascar, Comoro, Indonesia, Mexico and the Reunion. Aggregate global demand of Vanilla is estimated at about 4000-5000 metric tonnes a year and it is expected to go up to 14000 tonnes in by 2010. USA, UK, Germany and France are the major importers of Vanilla.

Although Vanilla was experimentally introduced in India in 1835, it became popular only from year 1990 onwards and its large scale cultivation also started recently.

Changes in the agricultural sector in the country in recent years after the liberalization of the economy have been causing serious concerns to all concerned. Drastic rise in prices of inputs with no commensurate increase in prices of the product have led the farmers to search for alternative crops and techniques to improve the income from their lands. Vanilla is one of the crops, which has emerged as a saviour to many farmers. It is becoming popular as an intercrop in Karnataka, Kerala and Tamil Nadu since early 1990s'.

From 1990 onwards, the area of cultivation has been increasing double-fold or triple-fold every year. At present, the area under cultivation in South India is about 2544 hectare. Karnataka occupies the first place in Vanilla cultivation in India. Totally, India is cultivating nearly 24000 hectares of Vanilla in Karnataka, Kerala, Tamil Nadu and testing portion of Vanilla is cultivated in North East region, Lakshadweep, Andaman and Nicobar islands. The area under Vanilla cultivation is increasing by about 10 per cent every year in the country.

At present, India occupies the sixth position among the world's Vanilla exporting nations. Indian Vanilla is considered to be of superior quality in the international market. An analysis of the vanilla industry in India in particular and global in general shows that there is huge potential for further development of the Vanilla economy which provides a golden opportunity to earn enough foreign exchange and create direct and indirect employment opportunities for the rural masses.

STATEMENT OF THE PROBLEM

Vanilla is one of the spices widely cultivated in many parts of Coimbatore district. As a plant, it has been said that it requires less maintenance. In terms of price, it is supposed to bring in the maximum returns to those who engage in the cultivation of Vanilla. There has been a continuous and perennial demand for Vanilla as it is put to use for variety of purposes, ensuring never falling demand. Coimbatore region was severely hit by drought during the recent years and many coconut trees were lost because of poor water source. To augment the income and to remain in agriculture, farmers have resorted to plant other crops along with the main crop. Vanilla has become one of the intercrops preferred.

Return in whatever field is a function of cost. Containment of cost leads to better returns and in many cases, helps to recover the initial cost at the earliest. Knowledge on the types of cost involved and methods to control the same enhances the profitability levels.

- What are the various costs involved in Vanilla plant cultivation?
- How do the costs behave over a period of time? What are the costs that remain static and what are such costs which vary?
- What is the average cost of production of Vanilla crop?
- An investment decision would be said to be prudent if appropriate attention had been paid to the time within which such investment helps to recover the amount spent. Are the farmers wise enough in choosing Vanilla cultivation?
- What is the payback period? What is the benefit associated with the cost incurred? To seek solutions to these

**Lecturer,* Department of Commerce, Sree Saraswathi Thyagaraja College, Pollachi- 642001, Coimbatore Dist, Tamil Nadu.
E-mail- maha.maha2007@rediffmail.com

questions, the present study has been under taken.

OBJECTIVES OF THE STUDY

The study has the following principal objectives:

(i) To find out the cost and return in Vanilla cultivation

(ii) To suggest suitable methods to increase the returns in Vanilla cultivation.

METHODOLOGY

The data required for the study have been collected through an interview schedule. Questions relating to the aspects of personal profile, land holding pattern, Vanilla cultivation, method of cultivation, sources of funds, yield of Vanilla, cost of cultivation, return in cultivation and disease and pest management are included in the interview schedule.

SAMPLE

The study is concerned with the farmers, who cultivate the Vanilla. Out of eighty three farmers, fifty nine farmers are selected in Coimbatore district. Convenience sampling method is followed in selection of the sample for the study.

FRAMEWORK OF ANALYSIS

Statistical tools like mean, payback method NPV, BC ratio have been used to analyze the data collected.

COST AND RETURN OF VANILLA CULTIVATION

The Indian farmers started vanilla cultivation in the mid 1990s, prompted mainly by the falling profits from rubber and coffee. Besides, vanilla could be grown even on small plots of land and the initial investment required in small. But it got popularized since 2000, as it fetched high price. The performance of vanilla and its profitability can be found out only by comparing the cost of cultivation and return from vanilla production. The cost is a major factor affecting the return from vanilla production. The cost and return differs from one farmer to another because of difference in cost of input, yield level, market price, quality of the bean, method of selling and the like.

Cost of Cultivation

Cost is the major determinant in return of any agricultural product. The cost of cultivation refers to the total expenses incurred by the vanilla growers in vanilla cultivation. Vanilla is a perennial crop. In the cultivation of vanilla, costs are incurred in different stages with different amount. Vanilla is being cultivated as an intercrop in arecanut, coconut, coffee field. Land is not considered as an item of investment because land is readily available for vanilla cultivation.

As vanilla starts to yield from third year onwards, the cost is classified as establishment cost and maintenance cost. Establishment cost refers to the total cost incurred in initial three years (pre-bearing stage) and maintenance cost refers to the cost incurred in the subsequent years.

Vanilla vine's average economic life span is considered to be of 15 years. The vine normally starts yielding from the third year after planting and the yield stabilizes by the sixth year. The vine yields optimally till the 12th year. Then its yield starts to decline year by year and after 15 years, replanting can be taken up.

Cost of Cultivation of Sample Farmers

The cost of cultivation of 59 sample farmers differs from farmer to farmer, because they have planted in different periods. So cost of inputs are not similar due to price changes in planting material, support trees, wages, method of

AVERAGE COST OF CULTIVATION IN VANILLA OF SAMPLE FARMERS

Area : 1 acre **No. of Vines: 910 vines**

Items of Expenses	1st year (Rs.)	2nd year (Rs.)	3rd year (Rs.)	4 - 15 years (per acre) (Rs.)
Preparation of land	3000	-	-	-
Establishment of irrigation	25000	-	-	-
Support trees (910 trees @ Rs.4)	3640	-	-	-
Planting of support tree (10 Labourers @ Rs.75)	750	-	-	-
Vanilla cuttings (910 @ Rs.25)	22850	-	-	-
Planting of cuttings	750	-	-	-
Manure	8000	8000	8000	8000
Application (5 Labourers @ Rs.75)	375	375	375	375
Intercultural activities	5000	5000	5000	5000
Plant protection	2000	2000	2000	2000
Pollination and harvesting	-	-	5000	5000
Total	71265	15375	20375	20375

cultivation like difference in number of vines per acre and the like. For instance, in 2000, vanilla cutting per meter was Rs.6 and in 2003, it went up to Rs.100, again from 2005 it comes to Rs.6. Thus differences in cost of inputs impacted the total cost of cultivation.

The following table shows the average cost of cultivation of sample returns.

It can be seen from the above table that the preparation of land, irrigation, support tree and its plantation, vanilla cuttings and its planting have come in the first year only but other expenses have occurred in subsequent years too and pollination and harvesting cost is incurred from third year onwards because it starts yield from third year onwards.

Return of Vanilla Cultivation

Returns are the ultimate aim of production. It depends on many factors like cost of production, method of marketing, market rate, demand of the product and the like. Vanilla cultivation got popularised in 2000 as it fetched the high price and high returns. Return of vanilla cultivation differs from farmer to farmer because of differences in cost of production, method of marketing like direct export or through agent, form of market like green beans or processed beans, demand, price of beans, quality of the beans and the like.

YIELD OF VANILLA

Yield of vanilla vine depends on method of cultivation, age of the vine and development of beans. The vine normally starts flowering and yielding from third year after planting. The yield will increase further and stabilize by sixth year. The vine will yield optimally for the next 8 to 10 years. The yield declines after 15 years and replanting is normally carried out at this time.

AVERAGE YIELD OF GREEN BEANS PER VINE

Years	1	2	3	4	5	6 – 12	13	14	15
Yield	0	0	100 gm	250 gm	500 gm	1 kg	500 gm	250 gm	100 gm

Of the sample farmers, 100 gm in 3rd year has been obtained from a plant and 250 gm, 500 gm and 1 kg is obtained in fourth, fifth and sixth year respectively. From sixth year till the 12th year, the yield will stabilize. Then it starts to decline from the 15th year. Then replanting is normally carried out after 15 years.

COST AND RETURN ANALYSIS IN VANILLA CULTIVATION

The profitability of crop production can be measured by comparing the benefits and the cost of the crop production.

At the first stage of Vanilla perennial crop, the total investment for the initial three years (Pre-bearing Period) is totaled to get the establishment cost and the compound interest is reduced to an annuity bearing 12 percent interest, at which credit could be available (bank's interest rate).

The annuity value is calculated from the annuity table. The annuity value is added to the annual maintenance cost to arrive at the total annual cost per unit area.

The average economic life span is considered to be 15 years. Out of which, the first 3 years are the pre-bearing or

COST AND RETURN OF CULTIVATION OF VANILLA (GREEN BEAN)

Area: 1 acre **No. of Vines : 910**

Particulars	Rs.
Establishment Cost per acre (for 3 years)	
Land Preparation	3000
Irrigation Established	25000
Support tree	3640
Planting – labour cost	750
Vanilla cutting and Planting	23500
Manures	24000
Manure application	1125

Intercultural activities	15000
Plant Protection	6000
Total Establishment cost	**1,02,015**
Maintenance cost per acre (910 vines)	
Manure	8000
Plant protection	2000
Labour cost (Manure application, inter culture activities and Pollination and harvesting) interest on working capital @ 12% per annum	10375 2445
Maintenance Cost	**22820**
Output and returns per acre (910 vines)	
1. Apportioned investment cost @ 12%	14975.80
2. Total maintenance cost	22820.00
3. Total cost of production	37795.80
Returns (910 vines)	
Average annual production kg/per acre	527.80
Gross returns @ Rs.1056.67 per kg	557710.42
Net returns	519914.62
Cost of production per kg	71.61
Net returns per kg	**985.05**

establishment period for Vanilla.

Average cost of cultivation of sample farmers is given in the table.

Note :

• Annuity value obtained from annuity table.

• Discount rate is 12% (bank interest is treated as discount rate).

Here the costs are classified into five categories. **Establishment and maintenance cost:** Establishment cost is incurred once in the life time of Vanilla Plant.So it is apportioned to all the years (life of the plant is considered as

COST OF CULTIVATION OF VANILLA (PROCESSED BEAN)

Area : 1 acre **No of Vines - 910**

Particulars		Rs.
Establishment cost per acre (for 3 years)		
Land preparation		3000
Irrigation cost		25000
Support tree		3640
Planting – labour cost		750
Vanilla cuttings and planting		23500
Manure		24000
Manure application		1125

Intercultural activities		15000
Plant protection		6000
Processing Instruments		
Vessel for boiling water	1000	
Bamboo basket	250	
Blankets & Gad a cloth	5000	
Wooden chests	6000	
Wooden trays and stands	10000	
Thermometer	200	
Hygrometer	1500	23950
Total establishment cost		**125965**

Maintenance Cost Per Acre With Recurring Expenses In Processing (910 Vines)	
Manure	8000
Plant Protection	2000
Labour cost (manure application, pollination and harvesting)	10375
Labour charge (Processing)	3000
Butter paper (Processing)	1000
Interest on working capital @ 12% per annum	2925
Total maintenance cost	**27300**
Output and returns per acre (910 Vines)	
1. Apportioned investment cost @ 12%	18491.66
2. Total maintenance cost	27300
3. Total cost of production	**45791.66**
Returns : Average annual production kg / acre (Processed beans)	105.56
Gross returns @ Rs.7100	749476
Net returns	**703684.34**
Cost of production per kg	433.80
Net returns per kg	6666.20

15 years). Interest on working capital is calculated @ 12%.

Note:

• Annuity value is derived from the annuity table.

• Discount rate is @ 12%.

COST - RETURN ANALYSIS

From the practical standpoint, the concept of cost- benefit analysis is adopted. The scope of this study is however confined to the direct costs and benefits only. The costs and return are discounted at 12% rate of interest.

In order to evaluate the worthiness of the investment in crop production, the following methods are applied.

1. Benefit - Cost Ratio (BCR)

This is a discounted measure of capital productivity. It is the ratio of the present worth of gross benefits to the present worth of gross costs. Ideally, the ratio should exceed one.

$$\text{BC ratio} = \frac{\sum_{i=1}^{n} \frac{Bn}{(1+r)^n}}{\sum_{i=1}^{n} \frac{Cn}{(1+r)^n}}$$

Where

$\frac{Bn}{(1+r)^n}$ = Present value of gross benefits (cash inflows)

$\frac{Cn}{(1+r)^n}$ = Present value of gross costs.

$$\text{B.C. ratio for Green beans} = \frac{3092951.09}{176777.17} = 17.49$$

Benefits cost ratio amounts to 17.49 for the Green beans. This shows that for everyone rupee of investment (other things being equal), a farmer will get Rs.18 (approx) as return. This ratio indicates that returns from vanilla cultivation promise tremendous profits.

$$\text{Benefits cost ratio for processed beans} = \frac{4248460.24}{213553.90}$$

$$= 19.89$$

Benefit cost ratio amounts to 19.89 in case of Processed Vanilla beans. It shows that for everyone, rupee of investment (other things being equal), a farmer will get Rs.20 (approx) as return. This ratio indicates that returns from Vanilla cultivation promises splendid profits.

Benefit cost ratio is 17.49 in production of green beans; whereas processed beans benefit cost ratio is 19.89. Hence, a farmer can get additional income of Rs.2 (approx) in case of production of processed beans. It is much advisable for a Vanilla grower to go for processing the beans instead of selling them as green / raw beans.

2. NET PRESENT VALUE

In order to compare the costs incurred with benefits received, considering the time spent and the money invested, the net present value method has been used. The net present value can be expressed as the difference between the discounted stream of gross benefits cumulated and that of gross costs cumulated ideally which should be positive. The formula for calculating NPV is as below.

$$\text{NPV} = \sum_{i=1}^{n} \frac{Bn - Cn}{(1+r)^n}$$

= Discounted cash inflows - Discounted cash outflows

NPV for Green beans = 3092951.09 - 176777.17

= 2916173.92 (+)

NPV for processed beans = 4248460.24 - 213553.90

= 4034906.34 (+)

The value of NPV shows that in terms of current cost, the return realized is more as compared to the cost incurred, indicating that it is highly advantageous on the part of the farmers to engage in Vanilla cultivation. As both the NPV values are positive, this investment is feasible. Cultivation of processed beans is more feasible than the green beans.

3. PAYBACK PERIOD

The payback period is the length of time required to recover the initial cash outlay on the project. According to the payback criterion, the shorter the pay back period, the more desirable it is. Since the crop has a long life, the farmers realize that they have to deal with greater risk and uncertainty over the period. The immediate interest is in recovering the initial investment quickly. The 'Pay back Period' criteria helps this purpose.

Green beans and processed beans have the payback period of 3 years but green beans deliver greater profit than the processed beans in subsequent years.

SUGGESTIONS

- Farmers are suggested to use organic farming because organic manure is the best and suitable nutrition to Vanilla. If chemical fertilizers are used, they are more expensive than the organic matter. Organic matter gives high yield in the Vanilla farming.
- Farmers are advised to avoid the chemical fertilizers as aforesaid, organic manure is the best nutrient for Vanilla. Besides using chemicals may lead to high cost of cultivation. Usage of organic manure may minimize the cost of input and provide high returns.
- Farmers are advised to sell the beans in the processed form because processed beans are priced higher than the raw green beans. Through the sale of processed beans, farmers can get the additional income.
- By getting organic certification, Vanilla can get the premium price for organic farming because international markets prefer organic products.
- Farmers are cultivating using different methods. But farmers are suggested to cultivate Vanilla as an intercrop as it fetches higher returns.
- In India, there is no domestic market for natural Vanilla. So the Govt. has to spread awareness among the manufacturers and hazards of using synthetic Vanilla should be highlighted.
- Vanilla is a labour intensive crop. So the Govt. should concentrate on expanding the employment opportunities by extending the area under cultivation.

CONCLUSION

Vanilla crop has called the attention of farmers all over the world as it promises better returns. As additional costs involved are less, a farmer with any existing plant can intercrop Vanilla to reap high returns. Farmers in Coimbatore district have found Vanilla to be a golden egg laying goose. The results of the present study point out the potential of Vanilla crop in yielding better returns for the amount of investment made. Prime importance has been assigned to ascertain the rate of return realized through Vanilla Cultivation. Nevertheless, several other studies may be conducted to study the different dimensions of Vanilla. A study may be carried out to examine the role played by the Spices Board to promote Vanilla Cultivation. Yet another study may be taken up to examine the causes that lead to price fluctuations in Vanilla. Marketing practices and returns may be the theme of another study. Usage of Vanilla may be propped into in order to explore the possibility of boosting up the consumption of Vanilla so that farmers who cultivate Vanilla could get better prices. The researcher would be highly satisfied if the results of the present study could be a beginning of a series of studies on Vanilla.

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Info@Orchidasia.com
www.orchidsasia.com
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Vani@agri123.com
Support@agricultureinformation.com
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