
Research Papers



COST OF PRODUCTION AND CAPITAL PRODUCTIVITY OF GRAPE CULTIVATION IN TAMILNADU, INDIA

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Abstract

Grape is one of the finest fruits and the most strength-giving food. It contains many valuable elements necessary for a healthy life. Grape not only serves as a table fruit but also is of great value. Therefore, it has gained enormous commercial value. Countries with sizeable extent of grape cultivation in the Asian region are China, Australia, India, Republic of Korea, Japan, Pakistan, New Zealand, Thailand, Vietnam and Myanmar. The total area under cultivation in these countries is estimated to be around 370000 hectares, with a total production of about 5000000 metric tonnes and average yield of about 14 tonnes per hectare. There are wide variations in average national yields and from variety to variety, ranging from five to 50 tonnes per hectare.

Key words: viticulture, cost, world, India, area, production, capital productivity.

INTRODUCTION

India has the distinction of achieving the highest productivity, i.e., 30 tonnes per hectare, of grape among the 83 grape growing countries in the world. The major area under grapes is confined to the tropical state namely, Karnataka, Maharashtra, Andhra Pradesh and Tamil Nadu which jointly contribute to more than 90 percent of the total area and production of grapes in India. Among the fruit crops, grapes occupy 6th position with a production of 1.13 million tonnes from an area of 0.04 million hectares. In the tropical climate of Tamil Nadu, the vine remains evergreen, with no dormant phase as is noticed in the North. This condition renders the harvest of three crops possible in a year or five crops in two years. Thus, the crop is available in the market almost throughout the year.

The present study was aimed to find out the

cost of production of grape in order to analyze the profitability of the crop and of the worth of grape cultivation as a capital investment opportunity.

METHODOLOGY

In Tamil Nadu, the study was conducted in two districts viz., Coimbatore and Theni where the concentration of fresh fruits is the maximum, during the period from December 2010 to March 2011 covering a total sample of 442 grape growers. Stratified multistage random sampling is adopted for the present study with block as the primary unit, Village panchayats as the secondary unit and the grape growers as the ultimate unit.

In the case of perennial crops like grapes, the total cost of production is divided into two aspects, namely, direct costs and indirect costs. The direct costs represent the establishment and maintenance costs and indirect costs include the annual share of establishment cost, interest on fixed capital, interest on working capital and depreciation.

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All the pre-bearing costs incurred during the first year till the vineyard comes to commercial yielding stage are termed as establishment cost. This includes the initial establishment cost, preparatory cultivation, cost of plants and planting of saplings, irrigation charges, cost of fertilizer and manuring, interest on land value and land tax, weeding and labour cost. It could be observed from the study, the pre-bearing stage of grape is 12 to 15 months.

All the recurring costs during the bearing stage consist of operational and maintenance costs are called as direct cost. Operational costs consist of the cost of human labour, irrigation, manure, fertilizer, plant protection, watch and ward and land tax. Maintenance cost is nothing but repair and upkeep of farm equipments and harvesting and handling charges.

The data was collected through personal interview method. Average of the input-output prices for the year 2009-2010 was used for this study. Percentage analysis was used for interpretation of data. To estimate the cost of production, annuity value method was used. Since the plant population per hectare showed wide variability, the per hectare cost of cultivation was worked out for a standard size of 1250 saplings based on the spacing recommended by the Horticulture Department, Government of Tamil Nadu.

Capital productivity analysis is the most important tool for evaluating the financial feasibility of perennial crops. It brings out the efficiency of capital use in production. The productivity of the capital invested in the vine yard was estimated by working out the Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR) and Payback Period.

RESULTS AND DISCUSSION

A. Establishment Cost of Vineyard

All the pre-bearing costs incurred during the first year till the vineyard comes to commercial yielding stage are termed as establishment cost. The operation-wise distribution of establishment cost for grape reveals that the initial establishment charges such as the cost of cut stone pillars and wire spreaded to erect a bower (Pandal) constitute the major percentage (60.73%) followed by Fertilizer and Manuring (10.9%). Labour cost accounts for 7.35 % and Interest on Land Value and Land Tax is 6.91%.

TABLE. 1
ESTABLISHMENT COST OF VINEYARD UPTO ONE YEAR (Rs/ Ha)

Sl.No	Variables	Cost (Rs)	Percentage
1.	Initial Establishment	146946.30	60.73
2.	Preparatory Cultivation	3326.60	1.37
3.	Plants and Planting	6031.65	2.49
4.	Irrigation charges	9250.00	3.82
5.	Fertilizer and Manure	25149.40	10.39
6.	Care of young plants	4288.00	1.77
7.	Interest on Land Value and Land	16721.45	6.91
8.	Weeding	12475.00	5.16
9.	Labour	17797.50	7.35
Total Establishment Cost		241986.00	100.00

Source: Calculated Data

B. Maintenance and Operational Cost

All the recurring costs during bearing stage consist of operational and maintenance costs. The operational and maintenance cost of bearing grape was worked out to Rs.48284.05 per hectare. In this case the maximum cost was incurred for the cost of fertilizer and manure (47.92 %) followed by labour (24.16 %), plant protection (12.48 %), and watch and ward (12.33 %).

TABLE. 2
MAINTENANCE AND OPERATIONAL COST OF VINEYARD (Rs/ Ha)

Sl. No	Variables	Cost (Rs.)	Percentage
1.	Labour	11672.00	24.16
2.	Irrigation	488.80	1.01
3.	Fertilizer and Manure	23139.3	47.92
4.	Plant protection	6024.10	12.48
5.	Watch and Ward	5953.30	12.33
6.	Land tax	27.00	0.06
7.	Repair and upkeep of arm implements	291.45	0.61
8.	Harvesting and Handling charges	688.10	1.43
Total Maintenance Cost		48284.05	100.00

Source: Calculated Data

C. Cost of Production

On an average, the establishment cost was worked out to Rs. 2,41,986.00 for the State considering one year as the establishment period of the crop. It was then amortised by dividing the life span of 25 years to get an annualized cost of establishment of the vine during the yielding phase to arrive at the cost of production of grape. The annual operational and maintenance cost of bearing grape was worked out to 48284.05 per hectare. The interest on fixed capital and the working capital was worked out @ 12.5 percent for a period of twelve months was added to get the total cost for cultivating one hectare of grape garden. The depreciation cost per year was worked out to Rs. 3502.74.

TABLE. 3
COST OF PRODUCTION PER HECTARE OF VINEYARD

Sl. No.	Cost components	In Rs.
1.	Annual operational and maintenance Cost	48284.05
2.	Amortised establishment cost	10999.36
3.	Interest on fixed capital	6035.51
4.	Interest on working capital	1374.92
5.	Depreciation	3502.74
Total Cost of Production (Rs/ha/yr)		70196.58
Average production (grape/ha)		9,247
Cost of production (Rs/kg)		7.59

Source: Calculated Data

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D. Capital Productivity Analysis

Capital productivity analysis brings out the worthiness of investment in the production. An attempt was made to measure the productivity of capital by estimating: (i) Net Present Value, (ii) Benefit-Cost Ratio, (iii) Internal Rate of Return and (iv) Pay back period.

The estimated cost of cultivation and returns obtained were used for these computations. Average price received by farmers was taken into account to arrive at the returns of farmers from the sale of grape.

TABLE. 4
FINANCIAL VIABILITY OF VINEYARD (HA)

SLNo	Components	Result
1.	Project Worth measures	at 7% discount
2.	Net Present Value(Rs)	155864.50
3.	Benefit-Cost Ratio	1.33
4.	Internal Rate of Return	24.76 %
5.	Payback Period	2.25 years

The net present value is the most valid technique of evaluating an investment project. It tries to project the feasibility of grape cultivation. It is the difference between the present worth of benefits and the present worth of costs. The net present value is found to be Rs. 155864.50. It indicates that the investment made on grape is viable.

Benefit cost ratio, computed on the basis of discounted cost and returns for the investment in grape cultivation. At the discounted rate of 15 per cent, the Benefit-cost ratio was 1.33. It indicates that on an average for one rupee invested in grape the benefit received would be Re.1.33 paise. Since the ratio is larger than unity the investment at the specified rate of discount is economically justified.

Internal Rate of Return is the rate at which the sum of discounted cash inflows equals the sum of discounted cash outflows. It is the maximum rate of interest which an organization can afford to pay on the capital invested in a project. Internal Rate of Return is 24.76 per cent. This rate is greater than the prevailing interest rate in the long-term investment. It reveals that the investment made in vineyard is profitable.

Pay-Back Period indicates the period within which the returns offset the investment. The pay back periods are worked out and they are 2.25 years. It indicates that the investment made in a vineyard will take 2.25 years to pay itself out. The project worth measures shows positive indicators. It is clear that frequent price fluctuation only affect the project worth. Moreover, the

highest level of opportunity cost is used for computation.

Grape is a small holder's crop in Tamilnadu. About 90 percent of the grape growers are small and marginal farmers with less than two hectares of land. Even though the economic analysis shows that this investment is so attractive, the farmers are not interested to invest in it further, because of the constraints like shortage of semi skilled labour, predominance of intermediaries and traders, pest attack, weeds, water shortage, credit, lack of input availability.

Conclusion

The establishment cost of a grape garden was worked out to Rs. 2,41,986.00 and the annual operational and maintenance cost of bearing grape was worked out to 48,284.05 per hectare. The establishment cost amortised and added up to maintenance cost. The cost of production was estimated to be Rs 7.59 per kilogram.

The Capital Productivity analysis showed favourable figures for Net Present Value (Rs.155864.50) and Benefit-Cost Ratio (1.33). Internal Rate of Return was worked to be 24.76 as against an opportunity cost of 7 per cent. The pay back periods are worked out and they are 2.25 years. It indicates that the investment made in a vineyard will be obtained with in 2.25 years.

The project worth measures shows positive indicators. It is clear that frequent price fluctuation only affect the project worth. Moreover, the highest level of opportunity cost is used for computation. Even though the economic analysis shows that this investment is so attractive, the farmers are not interested to invest in it further because of some constraints. Hence, it is the duty of the government to intervene in highly fluctuating price situations and provide supports to these farmers by way of implementing schemes like Minimum Support Price (MSP), market reforms and promotion of value addition programmes under co-operative sector.

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