

Cost of production and capital productivity of coconut in Kerala, India

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Abstract

The study was conducted with a view to compute the cost of production taking into consideration the annualized establishment cost and annual maintenance costs. The study was conducted during 1999-2001 in eleven districts of the State of Kerala and covered 792 farmers. The establishment cost of a coconut garden (upto seven years) was worked out to be Rs. 1,22,129.89 and the annual maintenance cost as Rs. 24,690. The establishment cost was amortized and was added to the maintenance cost. The cost of production was estimated to be Rs. 4.13 per nut. The Capital Productivity analysis showed favourable figures for Net Present Value (Rs.5286.31) and Benefit-Cost Ratio (1.02). The Internal Rate of Return was worked out to be 7.26 as against an opportunity cost of seven per cent. Though the project worth measures showed positive indicators, the values are marginal. It is clear that even a small fall in price can adversely affect the project worth. Price fluctuations may affect the management operations and ultimately affect production. Hence Governments have 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, better infrastructural facilities and promotion of value addition programmes under co-operative sector.

Key words: Coconut production and productivity, benefit-cost ratio, Minimum support price

Introduction

Coconut is a crop which is cultivated in about 90 countries. Out of this, about 89 per cent of the total coconut area is in the 14 major coconut growing countries. Even within the fourteen, 76.8 per cent of the area is under four major coconut growing countries, viz, India, Indonesia, Philippines and Sri Lanka. In India, coconut is cultivated in 190.8 lakh hectares. This comes to 16.02 per cent of the total world production.

In India, the State of Kerala accounts for 51.87 per cent of the total area under coconut in the country. The production is 5167 million nuts which forms 41.95 per cent of the country's total production.

Unlike the annual crops, the problem of investment

in perennial crops demand in depth consideration as their economic life spans more than a generation and once investments are made and resources are committed no retrieval is possible. Further, the magnitude of the problem demands vast resources and the flow of income spreads over a number of years.

In most parts of coconut growing areas in India it is grown under least care and management. Thus, the full potential is not being realized. The reason for the neglect of this important crop is the uncertainty in coconut prices. Contrary to the popular belief, the coconut farmers are not that handsomely paid (Das, 1986).

This study was aimed to find out the cost of production of coconut in order to analyze the profitability

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of the crop and of the worth of coconut cultivation as a capital investment opportunity.

Methodology

The study was conducted in eleven districts of Kerala during the period from May 1999 to May 2001 covering a total sample of 792 farmers. Three districts of the State were excluded from the study since their contribution to the total production in the state is relatively low. Three stage random sampling procedure was adopted for the study with block as the primary unit, panchayath as the secondary unit and individual farms as the ultimate.

This study was conducted in the State of Kerala, since 40 per cent of the coconut production in India is contributed by Kerala.

With respect to perennial crops like coconut, having a long gestation period and continuous yield for a number of years, calculation of cost should include both the cost of establishing the crop as well as its annual maintenance.

The establishment costs were computed as follows. The basic assumption was that the costs upto the 7th year constitutes the establishment cost since most palms belonging to the local variety start bearing by the 8th year and stabilized production is from 14th year onwards. It is difficult to get such historical data. Hence, a small sample of farms having young palms belonging to various age groups were selected. For this, a sample of cultivators having coconut plantations representing four different age groups were identified. 1 year old, 2-3 year old, 4-7 year old and 8-14 year old. The cost upto the age of 7 years was considered as establishment cost. Maintenance cost was computed from another two groups of farms of age 15-40 years and more than 40 years old.

The data were collected through personal interview method. Average of the input – output prices for the years 1999-2000 and 2000-2001 were used for the study. Percentage analyses was used for interpretation of data. To estimate 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 175 palms based on the spacing recommended by the Kerala Agricultural University.

Annuity value at the market rate of interest (10 %) has been calculated using the formula (Nelson *et al.*, 1973) given below :

$$A = \frac{i}{i-(1+i)^{-n}}$$

Where A is the annuity value, *i* = rate of interest and *n* = bearing period in years.

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. There are various methods to measure the capital productivity. The measures used in this study were: a. Benefit-Cost Ratio (BCR) b. Net Present Value (NPV), and c. Internal Rate of Return (IRR).

Results and Discussion

a. Establishment cost

The cost involved in the application of organic manures constituted the maximum percentage of the total cost (29.06%) followed by fertilizers (18.42%) and intercultural operations (17.37%). Irrigation also constituted 14.54 per cent of the total cost of cultivation.

Table.1 Establishment cost of coconut (upto 7 years) Rs/ha

Cost items	Cost (Rs.)	%
Clearing, levelling, bunding	3815.31	3.12
Digging pits, curing&filling pits	3311.26	2.71
Cost of seedling & planting	4768.18	3.90
Transport cost	1616.89	1.32
Irrigation	17760.19	14.54
Shading	2452.82	2.01
Farm yard manure	35496.95	29.06
Fertilisers	22495.94	18.42
Mulching	2915.23	2.39
Plant protection	2868.59	2.35
Ploughing, weeding and earthing up	21215.95	17.37
Fixed cost	3412.57	2.79
Total Cost	1,22,129.89	100.00

b. Maintenance cost:

Table. 2. Maintenance cost of bearing palms (Rs/ha)

Cost items	per hectare	% of total
Transport cost	208.42	0.84
Irrigation	1622.44	6.57
Farm yard manure	7024.83	28.45
Fertilizers	4703.81	19.05
Mulching	1015.26	4.11
Plant protection	950.36	3.85
Ploughing, weeding and earthing up	3784.37	15.33
Harvesting	3336.51	13.51
Heaping	1692.60	6.86
Fixed cost	352.07	1.43
Total Cost	24,690.66	100.00

The cost of maintenance of bearing palms was worked out to Rs.24,690.66 per hectare. In this case also the maximum cost was incurred for organic manures (28.45%), followed by fertilizers (19.05%), intercultural operations (15.33%) and harvesting (13.51%).

c. Cost of production of coconut

On an average, the establishment cost was worked out to Rs. 1,22,129.89 for the State considering seven years as the establishment period for the crop. It was then amortised at 10 per cent to get an annualized cost of cultivation of the palms during the yielding phase to arrive at the cost of production of coconut. To this, investment on annual maintenance cost @ 12.5 per cent for a period of six months was also added to get the total cost for cultivating one hectare of coconut garden. Net cost of production was found out after deducting income from byproducts and this when divided by the estimated production per hectare gave the cost of production per nut.

Table.3. Cost of production of coconut

Particulars	
Establishment cost (Rs/ha)	1,22,129.89
Amortized value (Rs/ha)	12383.97
Annual maintenance cost (Rs/ha/yr)	24690.66
Interest on annual maintenance cost (Rs/ha)	1543.17
Total cost (Rs/ha/yr)	38,617.80
Income from byproducts	2408.00
Net cost of production (Rs/ha/yr)	36,209.80
Average production (nuts/ha)	8759.00
Cost of production(Rs/nut)	4.13

Remold (2000) obtained cost of production per nut as Rs. 4.41 per nut. This is higher than the results of the present study (Rs. 4.13 per nut). The establishment cost was Rs. 1,42,014 which was higher than that of the present study (Rs. 1,22,129.89). This was the reason for the higher cost of production.

Sairam *et al.* (1997) estimated the cost of production for the established phase as Rs. 3.30 per nut in the case of rain-fed garden whereas for irrigated gardens it came to Rs. 2.60. The results of the present study showed that the cost of production is Rs. 4.13 per nut; which is higher than that of the cost of the study done by Sairam *et al.* (1997).

Capital Productivity Analysis

Capital productivity analysis brings out the efficiency of capital used in the production. An attempt was made to measure the productivity of capital by estimating:

1. Net present worth
2. Benefit-Cost ratio
3. Internal Rate of Return.

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 nuts. Salvage value of Rs.500 per palm was added to the returns at 60th year.

The results of the capital productivity analysis of the investment in coconut is furnished in Table 4.

Table.4. Financial viability of coconut garden (ha)

Project Worth measures	At 7 % discount
Net Present Value (Rs.)	5286.31
Benefit-Cost ratio	1.02
Internal Rate of Return	7.26%

Net Present Value is the present worth of the net cash flow stream. The formal selection criterion for the net present value measure of project is to accept all projects with a positive net present value when discounted at the opportunity cost of capital. Net present value obtained at seven per cent, the lowest opportunity cost of capital (current LT investment gain) was found to be positive (Rs.5286.31).

Benefit-Cost ratio is the ratio between present worth of benefits and that of costs. This indicates the return per rupee of investment. If the estimated figure is greater than unity the project is considered viable. Here the B-C ratio was found to be more than unity i.e. 1.02.

Internal rate of return is the discount rate that makes the net present value of the cash flow equal to zero. If the Internal Rate of Return is above the opportunity cost of capital the project is considered worth. The estimated Internal Rate of Return was 7.26 per cent.

Though the project worth measures showed positive indicators, the values are marginal. It is clear that even a small fall in price can affect the project worth. Moreover, the lowest level of opportunity cost is used for computation.

Coconut is a small holder's crop in Kerala. About 90 per cent of the coconut growers are small and marginal farmers with less than two hectares of land. It is mostly grown as a homestead crop. The farmers consider coconut as cash in hand as they can collect their daily requirements of food from the sale proceeds of the coconut on any day they like. Hence, even if the economic analysis shows that this investment is not so attractive, the farmers will continue to invest in it.

Summary

The establishment cost of a coconut garden (upto seven years) was worked out to be Rs. 1,22,129.89 and the annual maintenance cost as Rs.24,690.66. The establishment cost was amortized and was added up to

the maintenance cost. The cost of production was estimated to be Rs. 4.13 per nut.

The Capital Productivity analysis showed favourable figures for Net Present Value (Rs.5286.31) and Benefit-Cost Ratio (1.02). The Internal Rate of Return was worked out to be 7.26 as against an opportunity cost of seven per cent.

Though the project worth measures showed positive indicators, the values are marginal. It is clear that even a small fall in price can affect the project worth. The situation after the reference period of study has shown drastic reduction in price. Hence, the farmers should take up intercropping and other alternate enterprises to avoid or combat risk involved in pure crop cultivation due to drastic fluctuations in prices.

Adjustments in cultivation in the short run is difficult because of its perennial nature. But in the long run, further increase in area will be affected if adverse price situations prevail. In the short run, the management may be affected which will result in a decline in production. Hence, it is the duty of the Governments 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, better infrastructural facilities and promotion of value addition programmes under co-operative sector.

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References

- Das, P.K. 1984. Estimating production costs and returns for coconut in Kerala. *J.Plantn Crops* 12(2): 152-159.
- Nelson, A.G., Lee,W.F. and Murray, W.G. 1973. *Agricultural Finance*. The Iowa University Press, Ames. pp.44-47.
- Remold, M. 2000. Cost-benefit analysis of coconut (rainfed). *Indian Cocon. J.* 31(3): 7-9.
- Sairam, C.V., Gopalasundaram, P., Muraleedharan, K., George, M.V., Hegde, M.R. and Umamaheswari, L. 1997. Estimation of cost of production of coconut under optimum management conditions in North Kerala. *J. Plantn Crops.* 25(2): 163-168.