

Profitability of arecanut cultivation in the Kasaragod district in Kerala

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ABSTRACT

A unique feature of Kerala's agriculture in general and Kasaragod district in particular is that the cropping pattern has shifted in favour of commercial crops. In this shift, plantation crops increased considerably. Arecanut is an important commercial crop in the Kasaragod district of Kerala. During the past three decades, the arecanut cultivation underwent significant increase in area and production due to area effect and the yield effect. The input wise distribution of cost of arecanut by size of farm did not indicate any specific relation between the total cost of cultivation and the size of farm. Yield per hectare of arecanut indicated inverse relation with the size of farm. Estimating costs and returns of arecanut cultivation in Kasaragod in terms of PBP, IRR, NPV and BCR revealed that arecanut cultivation is profitable in the district. The study also revealed that profitability of arecanut is inversely related to the size of arecanut garden

Key words : Kasaragod, arecanut cultivation, cost of cultivation, profitability

Arecanut is used by all sections of people as masticator either alone or in combination with betel leaves, lime and tobacco. It is an essential requisite for several religious and social ceremonies. In olden days it was used as a human and veterinary medicine (Bhalerao and Singh, 1985). With the development of modern medicine, its medicinal value steadily began to wane. The arecanut palm grows in different climatic and soil conditions and is grown in India, Bangladesh, Srilanka, Malaysia, Indonesia, Philippines and Myanmar (Jose and Jayasekhar, 2008). In India, among the arecanut growing states, Kerala, Karnataka and Assam account for 95 percent of total area and 90 percent of total production (Anonymous, 2014). In Kerala, arecanut is cultivated in all districts. The proportion of area under arecanut in the state is very high when compared with other states. In terms of income, arecanut occupies an important place in the economy of Kerala and it is predominantly a small farmer's crop (Karunakaran, 2015).

Kasaragod District was organised on 24th May 1984 and is the northernmost district of the State of Kerala. The land use pattern shows that, in the district arecanut is the major crop next to coconut and rubber,

accounting about ten percentage of the total cropped area (Karunakaran, 2014). In the district, arecanut is mainly a small farmer's crop and more than 75 percentages of the holdings are of less than two hectares in size. Any change in its cultivation either in terms of area, production or productivity would seriously affect the weaker sections of the agriculture population. The present study is therefore, an attempt to analyse the profitability of arecanut cultivation in the Kasaragod district against the background of the agricultural sector of Kerala.

MATERIALS AND METHODS

The study used both primary and secondary data. Primary data was collected from seventy two arecanut growers of the Kasaragod district. The major source of secondary data are various published reports of the Department of Economics and statistics, Thiruvananthapuram, State planning Board, Thiruvananthapuram, Directorate of Cocoa, Arecanut and spices Development, Kozhikode and Directorate of Economics and statistics, Government of India.

The time element in the calculation of cost and returns has been taken care of seriously (Singh, *et.al*, 1982) for evaluating the profitability of arecanut gardens with the

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help of the four major techniques widely used in the project evaluation. These four techniques are given below:

Pay Back Period (PBP)

The PBP is the number of years an investment project taken to recover costs from its returns. The PBP equals t^* , where t^* is the lowest value of 't' for which the following inequality holds:

$$\sum_{t=1}^{t^*} C_t < \sum_{t=1}^{t^*} R_t$$

Where,
 R_t = Return in Period t
 C_t = Cost in Period t.

Net Present Value (NPV)

The NPV on investment is the discounted value of all cash inflows, net of all cash outflows of the project during its life time. It can be computed as:

$$NPV = \sum_{t=1}^T \left(\frac{R_t - C_t}{(1+i)^t} \right)$$

Where,
 i = discounted rate
 T = number of years.

Internal Rate of Return (IRR)

The IRR is that discount rate at which the NPV is zero. The equation for its calculation is

$$\sum_{t=1}^T \left(\frac{R_t - C_t}{(1+r)^t} \right)$$

BENEFIT COST RATIO (BCR)

The BCR of an investment is the ratio of the discounted value of all cash inflows to the discounted value of all outflows during the life of the project. It can be computed as

$$BCR = \frac{\sum_{t=1}^T \frac{R_t}{(1+i)^t}}{\sum_{t=1}^T \frac{C_t}{(1+i)^t}}$$

RESULTS AND DISCUSSION

In Kerala, the area and production of arecanut is spread in almost all districts. Table 1 shows the area under cultivation of arecanut in Kasaragod district. The percentage of arecanut area increased considerably in the district.

Table 1 Changes in the area under Arecanut crop in Kasaragod district (1985-86 to 2013-14)

Sr. No.	Year	Area (in hectare)	Percentage increase
1	1985-86	8907	-
2	1990-91	12269	38
3	1995-96	12710	43
4	2000-01	13515	52
5	2005-06	17622	98
6	2006-07	14910	67
7	2007-08	15060	69
8	2008-09	14927	68
9	2009-10	15256	71
10	2010-11	18039	103
11	2011-12	19552	120
12	2012-13	18937	113
13	2013-14	19488	119

Source : Computed from (i) Statistics for planning (various issues), Department of Economics and Statistics, Govt. of Kerala, Thiruvananthapuram. (ii) Economic Review (various issues), State Planning Board, Govt. of Kerala, Thiruvananthapuram.

In 1960-61, the area under arecanut was 55 thousand hectare. In all the decades except 1970's, Kerala experienced significant increase in the area under arecanut cultivation (Karunakaran, 2013). During the last five decades, many of the northern districts and central districts observed percentage increase in the area and all the southern districts showed decrease in the area under arecanut cultivation.

In Kasaragod, coconut, arecanut, rubber and banana observed increase in the proportion of area. Area under rice, pepper, cashewnut, tapioca, cardamom and ginger experienced declining trend. One important feature of the cropping pattern of Kasaragod district is the high proportion and continuous increase of arecanut area in the total cropped area (Table 2).

Table 2 Cropping Pattern change in the Kasaragod District in Kerala

Sr. No.	Crops	1985-86	1990-91	1995-96	2000-01	2005-06	2013-14
1	Rice	3	4	5	5	6	6
2	Coconut	1	1	1	1	1	1
3	Arecanut	6	5	4	4	4	3
4	Rubber	4	3	3	2	2	2
5	Pepper	5	6	6	6	5	5
6	Cashewnut	2	2	2	3	3	4
7	Tapioca	7	8	8	8	8	8
8	Ginger	9	9	9	9	9	9
9	Banana	8	7	7	7	7	7

Figures shows rank of each crop in the Total Cropped Area

Source : Computed from (i) Statistics for planning (various issues), Department of Economics and Statistics, Govt. of Kerala, Thiruvananthapuram. (ii) Economic Review (various issues), State Planning Board, Govt. of Kerala, Thiruvananthapuram.

Arecanut cultivation is the chief economic activity of the district. It is a main source of income and employment. Therefore its further development is a real necessity. As long as cultivation is in the private sector, commercial farmer will continue the cultivation only if it is a gainful activity (Duggappa, 2013). The profit or loss of cultivation of a crop is the difference between the cost of various inputs used and the value of main product and the by product obtained from it (Gopal Naik and Arora, 1986). Therefore, an analysis of the costs and returns is very relevant to measure the profitability of arecanut cultivation.

Input-wise maintenance cost of arecanut

The input-wise maintenance cost of arecanut is estimated under the three different concepts of cost and is presented in Table 3. The important items of Cost A are seed/seedlings, hired human labour, farm yard manure, chemical fertilizers, irrigation, depreciation, plant protection, interest on working capital and other expenses. Cost B includes Cost A, rental value and interest on fixed capital. Cost C is the totality of Cost B and family labour charges.

The estimated cost of arecanut cultivation under various cost concepts given in Table 3 indicated that

cost A, B and C exhibited positive relation with the size of arecanut farm. The proportion of total costs on hired human labour, farm yard manure, irrigation, chemical fertilizers, plant protection, interest on working capital and other expenses indicate positive relation with the size of farm; whereas proportion on total cost on seed/seedlings, depreciation, rental value, interest on fixed capital and family labour charges exhibited negative relationship with the size of farm. Among the small farmers, hired human labour charges accounted for the highest share of the total cost, followed by farm yard manure, rental value, family labour charges, irrigation and interest on fixed capital. In the case of medium farmers also hired human labour charges accounted for the highest share of the total cost followed by farm yard manure, rental value, irrigation, family labour charges and interest on working capital. The large farmer's hired human labour charges accounted for the highest share of the total cost, followed by farm yard manure, rental value, irrigation costs, interest on working capital and interest on fixed capital.

Average yield of arecanut

The data presented in Table 4 indicated that size of farm is negatively related to yield per hectare. It is

Table 3 Input-wise proportion of maintenance cost of Arecanut in the Kasaragod district

Sr. No.	Particulars	Size of arecanut farm		
		Small	Medium	Large
1	Seed/seedlings	3.56		
2	Hired Human Labour	39.65	3.31	2.93
3	Farm yard manure	13.68	40.15	41.35
4	Chemical Fertilizers	3.73	14.03	14.84
5	Irrigation	5.94	3.61	3.49
6	Depreciation	3.00	6.32	6.32
7	Plant Protection	3.67	2.52	2.10
8	Interest On Working Capital	5.58	4.04	3.92
9	Other Expenses	2.92	5.79	6.06
	Cost A	81.74	3.55	4.35
10	Rental Value	4.36	83.33	85.34
11	Interest On Fixed Capital	5.94	4.19	4.00
	Cost B	92.04	5.44	5.37
12	Family Labour Charges	7.96	92.96	94.72
	Cost C	100.00	7.04	5.28
			100.00	100.00

Figures indicate percentage to total cost.

Source: Primary Data.

estimated that the average yield of arecanut per hectare is 17.50 quintals for small farm, 16.80 quintals for medium farm and 15.25 quintals for large farm.

Profitability of arecanut cultivation

Since the gestation period for arecanut is much longer than that for other crops and its economic life is about 50 years, the time element in the calculation of cost and return was worked out for evaluating the profitability of arecanut garden. This is by discounting of costs and returns. The age wise data on costs and returns were also worked out for computing the various measures of profitability. The net present value (NPV) and benefit cost ratio (BCR) are functions of discount rate and are negatively related to discount rate. The discount rate used in the study is equal to the opportunity cost of capital and since the opportunity

cost could vary from 8 to 15 percent, these measures were calculated separately for two discount rates, viz., 12 and 14 per cent.

The four measures of profitability, viz., payback period (PBP), net present value (NPV), internal rate of return (IRR) and benefit cost ratio (BCR) were calculated and the result is given in Table 5.

The payback period obtained (13 years) is less than the maximum PBP (14 to 15 years) desired by the farmers in the district. Hence, according to the criteria of PBP, arecanut cultivation is profitable in the district. Results of Net Present Values (NPV) at 12 per cent and 14 per cent were positive and quiet high also indicates the profitability of arecanut cultivation. The Internal Rate of Return ranged from 33.40 per cent for large farmers to 33.70 per cent for medium farmers. It was much greater than the cost of borrowing capital, which ranged from 10 to 15 per cent, for borrowing from financial institutions in Kerala shows that arecanut cultivation is profitable. The benefit cost ratio at 12 percentage of discount rate ranged from 1.48 percent in large farmers to 1.96 per cent in medium farmers. Even at a higher rate of discount of 14 per cent, the BCR ranged from 1.42 per cent in large farmers to 1.52 per cent in medium farmers. In all the size groups it was greater than unity. Hence, according to the criterion of BCR also arecanut cultivation is profitable.

Table 4 Yield per Hectare of Arecanut in the Kasaragod district

Sr. No.	Size of arecanut farm	Yield (in Quintals)
1	Small	17.50
2	Medium	16.80
3	Large	15.25

Source: Primary Data.

Table 5 Profitability of Arecanut crop in the Kasaragod District

Sr. No.	Particulars	Size of arecanut farm		
		Small	Medium	Large
1	PBP (Years)	12.80 (I)	13.30 (II)	13.60 (III)
2	IRR (%)	33.50 (II)	33.70 (I)	33.40 (III)
3	NPV (Rs)			
4	At 12 %	38204 (II)	47758 (I)	29992 (III)
5	At 14 %	21476 (II)	25696 (I)	19622 (III)
6	BCR			
7	At 12 %	1.88 (II)	1.96 (I)	1.48 (III)
8	At 14 %	1.50 (II)	1.52 (I)	1.42 (III)

Figures in bracket indicate rank.

CONCLUSION

The agricultural economy of the district has been showing signs of stagnation or even decline in a few of its most important sectors. One important feature of the agriculture sector of the district is that of change in cropping pattern in favour of commercial crops. In this, plantation crops increased considerably.

Arecanut cultivation is one of the main economic activities of the district and is an important source of income and employment to the people. Therefore, an analysis of the costs and returns of this crop is a real necessity so as to measure the profitability. The input wise distribution of cost of arecanut by size of farm did not indicate any specific relation between the total cost of cultivation and the size of farm. Yield per hectare of arecanut indicated inverse relation with the size of farm. Estimating costs and returns of arecanut cultivation in the district found that arecanut cultivation is profitable. It is also revealed that profitability of arecanut is inversely related to the size of farm. This clearly reveals the implementation of proper measures and policy decisions on the part of the government for the effective development of arecanut crop in the district.

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