

Profitability of Arecanut Cultivation in Jalpaiguri Area of West Bengal - A Sample Study

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Abstract

The profitability of arecanut cultivation in Jalpaiguri was evaluated with the help of four techniques widely used in project evaluation. The study revealed that arecanut cultivation was profitable in the region and there was no need to replant any of the gardens from the samples. Among the three size groups of arecanut gardens, the large size-group i. e., with an area of 0.69 ha under arecanut was the most profitable size of arecanut garden in the region.

Introduction

Investigations into the productivity or cost and returns in arecanut in India, conducted by various agencies, have been based mostly on the traditional concepts and techniques without considering the time element, which must be taken into consideration in view of the longer gestation period required by arecanut. The present study was planned with an objective to analyse the profitability of arecanut cultivation, to determine the replacement time of arecanut palms and the most profitable size of arecanut garden.

Materials and Methods

The study is based on the data collected from a stratified random sample of 190 arecanut growers-50 small (2 ha and below), 67 medium (above 2 ha to 4 ha) and 73

large (above 4 ha) - selected from thirty seven panchayats of seven blocks in Jalpaiguri district, West Bengal. Data were collected by survey method for a period of two years, 1978-'79 and 1979-'80.

The time element in the calculation of cost and returns has been taken care of by evaluating the profitability of arecanut gardens with the help of the four major techniques widely used in the project evaluations.

Pay Back Period (PBP)

$$t^* \sum_{t=1}^{t^*} Ct < \sum_{t=1}^{t^*} Rt$$

Where:
Rt = Return in period t
Ct = Cost in period t

Net Present Value (NPV)

$$NPV = \sum_{t=1}^T \frac{Rt - Ct}{[1+i]^t}$$

Where
i = discount rate
T = number of years

Internal Rate of Return (IRR)

$$\sum_{t=1}^T \frac{Rt - Ct}{[1+r]^t} = 0$$

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Benefit Cost Ratio (BCR)

$$BCR = \frac{\sum_{t=1}^T \frac{Rt}{[1+i]^t}}{\sum_{t=1}^T \frac{Ct}{[1+i]^t}}$$

Results and Analysis

(1) Pay Back Period (PBP)

The PBP ranged from 8.7 years to 9.5 years which was less than the maximum

pay back period (10 to 12 years) desired by the sample growers. Hence, according to the criterion of PBP, arecanut cultivation was profitable (Table 1).

(2) Net Present Value (NPV)

The NPV at 10 per cent discount rate ranged from Rs. 47,874 for medium farmers to Rs. 54,420 for large farmers. Even at higher discount rate of 12 per cent, NPV ranged from Rs. 32,507 for medium farmers to Rs. 35,052 for large farmers. These values of NPV were positive and

Table 1. Measures of profitability (investment worth) in arecanut (n=11)

Sl. No.	Particulars	Size group			All farms
		Small	Medium	Large	
1.	Pay back period [Years]	8.7 [I]	9.5 [III]	9.20 [II]	9.3
2.	Net Present Value [NPV] Rs.				
	10%	50876 [II]	32507 [III]	54420 [I]	21253
	12%	34956 [II]	32507 [III]	35052 [I]	34599
3.	Internal Rate of Return [IRR] %	24.8 [I]	24.4 [III]	24.6 [II]	24.74
4.	Benefit Cost Ratio [BCR] at				
	10%	2.4 [II]	2.3 [III]	2.5 [I]	2.411
	12%	2.2 [I]	2.0 [III]	2.1 [II]	2.1

Figures in parentheses indicate ranks

Table 2. Average annual returns for arecanut (Rs. / ha)

Sl. No.	Particulars	Size group			All farms
		Small	Medium	Large	
1.	Net Present Value				
A ₁	at 10%	50786	47874	54420	51253
A ₂	at 12%	34956	32507	35052	34576
2.	Present value of annuity of rupee one for 40 years				
B	at 10%	9.779	9.779	9.779	9.779
C	at 12%	8.244	8.244	8.244	8.244
3.	Average Annual Return				
i]	at 10%	$\frac{50786}{9.779}$	$\frac{47974}{9.779}$	$\frac{54420}{9.779}$	$\frac{51253}{9.779}$
A ₁ / B =		5193.374	4895.592	5564.986	5241.128
ii]	at 12%	$\frac{34956}{8.244}$	$\frac{32507}{8.244}$	$\frac{35052}{8.244}$	$\frac{34576}{8.244}$
A ₂ / C =		4240	3943	4252	4198

quite high. Hence, according to this criterion, arecanut cultivation was profitable (Table 2).

(3) Internal Rate of Return (IRR)

The IRR ranged from 24.4 per cent for medium farmers to 24.8 per cent for small farmers. It was much greater than the cost of borrowing capital, which ranged from 9 per cent to 14 per cent, for borrowings from co-operatives and commercial banks in the region. Thus, according to this criterion, arecanut cultivation was profitable (Table 1).

(4) Benefit Cost Ratio (BCR)

The BCR at 10 per cent discount rate ranged from 2.3 for medium farmers to 2.5 for large farmers. Even at higher rate of discount of 12 per cent, it ranged from 2.0 for medium farmers to 2.2 for small farmers. In all the size groups, it was greater than unity. Hence, according to this criterion also, arecanut cultivation was profitable (Table 1).

Replacement period

The average annual returns (AAR) help us in determining the replacement period of arecanut palms. AAR is Computed as follows:

$$\text{AAR} = \frac{\text{NPV}}{\text{Present value of annuity of Re. 1 for n years}}$$

In the case of arecanut 'n' is taken as 40 years.

The AARs computed at 10 per cent and 12 per cent discount rate indicate that so long as net returns (revenue - cost) per ha are greater than Rs. 4240 for small farmers, Rs. 3943 for medium farmers and Rs. 4252 for large farmers, the arecanut gardens do not require replacement. Thus, on this basis, no arecanut garden of the sample farmers need to be replanted at this stage since none of the sample gardens reported net returns (up to 40 years of age) below the AARs computed above (Table 2).

Most profitable size of arecanut garden

From all the measures of profitability given in Table 1, it is clear that the large size gardens rank first, followed by small size and medium size gardens. The average size for small farmers was 1.34 ha, for medium farmers 2.97 ha and for large farmers 6.65 ha, whereas the average size of arecanut garden for small farmers was 0.22 ha, for medium farmers 0.36 ha and for large farmers 0.69 ha. Thus among these three size groups of arecanut gardens, the large size group, i.e., with an average area of 0.69 ha under arecanut, was the most profitable size of arecanut garden in the region.

Conclusion

The above analysis reveals that the profitability of arecanut cultivation in the Jalpaiguri region is quite high.