Benefit-Cost Ratio Analysis of Pineapple Orchard in Meghalaya

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ABSTRACT

The present study was conducted in Ri-Bhoi district of Meghalaya. Pineapple cultivation was found to be economically feasible in the state. The category wise economic analysis of pineapple implies economies of scale. Cultivation of pineapple in the region is undoubtedly a very perspective venture with the region being an agrarian society with an average of 80 per cent tribal population, this will result in a breakthrough of social empowerment of the tribal people of the North East states of India. Thus, economic benefits of pineapple should be realised to the farmers to enhance the production and productivity of pineapple. Pineapple production in the region is organic by default, hence organic pineapple certification agencies should be initiated in the state. A suitable scientific package of practices of pineapple in local dialect should be prepared for the pineapple growers.

Keywords: B-C ratio, Pineapple, Orchard, Meghalaya

INTRODUCTION

India ranks third in area and sixth in pineapple production in the world with an area of 91.90 thousand ha and production of 13.86 lakhs million ton during 2010 (NHB 2010). The NEH region produces more than 40 per cent of the total pineapple of the country and almost 90-95 per cent of the produce is organic (Chishi 2010). The total area in Meghalaya under fruits is 27.74 thousand ha in which pineapple contributes 38 per cent area (10.5 thousand ha) (Anonymous 2010). Area under pineapple production was observed to increase in Meghalaya, but the productivity is still low. The farmers are always interested in maximizing their profit and not merely production. Therefore, there is a need to carry out a benefit cost and returns analysis is carried out systematically and this study is an effort in that direction.

MATERIALS AND METHODS

The present study was conducted in four villages viz., Thad, Shagbangla, Nongkhrah and Phammyrloi of Ri-Bhoi district of Meghalaya during 2011-12. The primary data were collected from the respondents through personal interview method on pre-tested well structured questionnaire. Total 60 pineapple growers were selected randomly and categorised into three categories *viz,* small (up to 1.99 ha), medium (2 to 3.99 ha) and large (4 ha and above). For analysis of data, budgeting techniques and cost concepts (establishment cost, fixed cost, variable cost and total cost)and economic efficiency measures viz.,Benefit-Cost Ratio, Net Present Value, Payback period and Break–Even point were used.

Benefit-Cost Ratio

This criterion indicates the rate of return per rupee invested in pineapple enterprise. It was worked out by dividing the sum of discounted net cash flow by the establishment cost at 9 per cent rate of interest (Reddy and Ram 1996).

$$\text{BC Ratio} = \frac{\text{Present Worth of Gross returns}}{\text{Present worth of costs}}$$

Payback period

Payback period represents the length of time required for the stream of cash proceeds produced by the investment to be equal to the original cash outlay i.e., the time required for project to pay for itself. In the present study payback period of

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pineapple after fruit bearing was calculated by using the following formula.

$$PBP = \frac{\text{Discounted total cost}}{\text{Annual increase in income (Mean discounted benefit)}}$$

Break –Even point

Break- even point is the point at which the two curves, total cost curve and total revenue curve intersect which indicate the level of production at which the producer neither loss money nor makes a profit. It was calculated by using the following formulae

$$BEP = \frac{TFC}{(ASP-AVC)}$$

Where,
TFC= Total fixed cost
ASP= Average sale price of pineapple
AVC= Average variable cost

RESULTS AND DISCUSSION

Cost and returns

It is evident from Table 1 that the total cost incurred was found to be less in the second year of the orchard in all the categories. In small farm the first year cost was ₹23125.38, second year was ₹13987.58 and in third year it was ₹32692.26; in medium farm it was ₹30334.69, ₹16020.78 and ₹38348.23 in first, second and third year and in large farm it was ₹44080.09, ₹15965.27 and ₹41612.88. This crop generates negative returns during the

initial two years and start giving positive returns from third year onwards. The gross returns of large farms were found more as compared to small and medium category farms. The productivity of pineapple orchard was found to be 18.68 t/ha, 18.70 t/ha and 21.99 t/ha on small, medium and large category. Net returns on small, medium and large farms were found to be ₹ 50795.07, ₹ 51637.23and ₹ 63401.94 respectively (Table 1 to 3). It indicates that the net returns in pineapple orchard increases with the increase of size of orchards, and it implies the principle of economies of scale. It is evident from the analysis that the orchard has to bear a loss of ₹ 32513.38 and ₹ 15324.54 in first and second year, respectively. During the third year the net return was ₹ 103116.01 and after that it becomes more or less stable up to 25 years. The share in total cost was found to be increasing with the age of plants which needs more inputs with the increasing age whereas, the share of land rent was more in initial as compared to second and third year and it was due to proportionate cost share increase in other items of total cost with the increase in age of plants.

Economic viability of pineapple orchard

The economic feasibility indicators of pineapple orchard are presented in Table 4. The B-C ratio was estimated as 1.61:1 for small, 1.48:1 for medium and 1.49:1 for the large category with an average ratio of 1.52:1. The benefit cost ratio was found to be more in the large category because of increase productivity of large farms. The B-C ratio analysis

Table 1: Cost and returns from pineapple orchard on small farms

Sl. no	Particulars	Years			Total cost	Average cost per annum (₹/ha)
		I	II	III		
1	Productivity (t/ha)	-	-	18.68		
2	Land rent	10000 (43.24)	10000(71.49)	10000(30.59)	30000(42.98)	10000(42.98)
3	Operational cost	2723.57(11.78)	3306.21(23.64)	16308.62(49.88)	22338.40(32.00)	7446.13(32.00)
4	Depreciation	182.62(0.79)	156.37(1.12)	224.80(0.69)	563.79(0.81)	187.93(0.81)
5	Interest on working capital (@ 7%)	1050.00 (4.54)	525.00(3.75)	1400(4.28)	2975.00(4.26)	991.66(4.26)
6	Establishment cost	9169.19 (39.65)	-	-	9169.19(13.13)	3056.39(13.13)
7	Marketing cost	-	-	4758.84(14.56)	4758.84(6.82)	1586.29(6.82)
8	Total cost (2 to 7)	23125.38(100)	13987.58(100)	32692.26(100)	69805.22(100)	23268.40(100)
9	Gross returns			120600.29	120600.29	40200.09
10	Net returns	-23125.38	-13987.58	87908.03	50795.07	16931.69

Note: Figures in parentheses are percentage of the total

Table 2: Cost and returns from pineapple orchard on medium farms

Sl. no	Particulars	Years			Total cost	Average cost per annum (₹/ha)
		I	II	III		
1	Productivity (t/ha)	-	-	18.70		
2	Land rent	10000(32.96)	10000(62.42)	10000(26.08)	30000(35.42)	10000(35.42)
3	Operational cost	2689.33(8.87)	5306.23(33.12)	23716.04(61.84)	31711.60(37.44)	10570.53(37.44)
4	Depreciation	266.04(0.88)	189.55(1.18)	284.97(0.74)	740.56(0.87)	246.85(0.87)
5	Interest on working capital (@ 7%)	1050(3.46)	525(3.28)	1400(3.65)	2975(3.51)	991.66(3.51)
6	Establishment cost	16329.32(53.83)	-	-	16329.32(19.28)	5443.11(19.28)
7	Marketing cost	-	-	2947.22(7.69)	2947.22(3.48)	982.40(3.48)
8	Total cost (2 to 7)	30334.69(100)	16020.78(100)	38348.23(100)	84703.70(100)	28234.56(100)
9	Gross returns	-	-	136340.93	136340.93	45446.97
10	Net returns	-30334.69	-16020.78	97992.70	51637.23	17212.41

Note: Figures in parentheses are percentage of the total

Table 3: Cost and returns from pineapple orchard on large farms

Sl. no	Particulars	Years			Total cost	Average cost per annum (₹/ha)
		I	II	III		
1	Productivity (t/ha)	-	-	21.99		
2	Land rent	10000(22.69)	10000(62.64)	10000(24.03)	30000(29.51)	10000(29.51)
3	Operational cost	4758.85(10.80)	5160.77(32.32)	22057.39(53.02)	31977.01(31.46)	10659.00(31.46)
4	Depreciation	325.55(0.74)	279.50(1.75)	467.59(1.12)	1072.64(1.05)	357.54(1.05)
5	Interest on working capital (@7%)	1050(2.38)	525(3.29)	1400(3.36)	2975.00(2.93)	991.66(2.93)
6	Establishment cost	27945.69(63.39)	-	-	27945.69(27.49)	9315.23(27.49)
7	Marketing cost	-	-	7687.90(18.47)	7687.90(7.56)	2562.63(7.56)
8	Total cost (2 to 7)	44080.09(100)	15965.27(100)	41612.88(100)	101658.24(100)	33886.08(100)
9	Gross returns	-	-	165060.18	165060.18	55020.06
10	Net returns	- 44080.09	-15965.27	123447.30	63401.94	21133.78

Note: Figures in parentheses are percentage of the total

Table 4: Break-even point, Net Present Value and Benefit Cost ratio of orchard

Category	Net Present Value	Benefit -Cost ratio	Break-Even point (t)	Payback period (Year)
Small	36149.10	1.61	2.23	0.85
Medium	35752.68	1.48	2.37	0.93
Large	43232.27	1.49	2.86	0.90
Average	38378.03	1.52	2.49	0.80

indicates that the investment in pineapple orchard is economically viable and on an average ₹1 investment brings ₹ 1.52 returns. The break-even point of small orchard was reached at 2.33 tonnes, 2.37 tonnes and 2.86 tonnes in small, medium and large category of orchard. Overall, the average break-even point was worked out to be 2.49 ton. Further, the payback period was estimated at 0.85 years in small orchard, 0.93 years in medium orchard and 0.90 years in large orchard from bearing year. Overall, it took 0.89 years after fruiting to repay back the investment incurred in the orchard.

Pineapple cultivation is capital intensive. It was found to be economically feasible in the state. The category wise economic analysis of pineapple

implies economies of scale. The Benefit Cost ratio was worked to be 1.61, 1.48 and 1.49 in small, medium and large category. The Break-Even point was at 2.33 tonnes in small category, 2.37 tonnes in medium category and 2.86 ton in large category. The payback period from fruiting was found to be 0.85 year, 0.93 year and 0.90 year in small, medium and large category of orchards. Thus, economic benefits of pineapple should be realised to the farmers to enhance the production and productivity of pineapple. Pineapple production in the region is organic by default, hence organic pineapple certification agencies should be initiated in the state. A suitable scientific package of pineapple in local dialect should be prepared for the pineapple growers.

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