An Economic Analysis of Cost of production of Pineapple in Tseminyu District of Nagaland

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Abstract

The present study was conducted in Tseminyu district of Nagaland. Totally 60 respondents were randomly selected and interviewed from the district. The data was gathered in the form of prestructured interview schedule. The study revealed that average cost of cultivation of pineapple per hectare was incurred Rs. 96056.8 which was found to be Rs. 78510.5, Rs. 1,00,993.6, and Rs. 1,08,666.5 per hectare on Marginal, Small and Semi-medium respectively. Input-output ratio related to cost C was (1:1.68) (1:1.61) and (1:1.68) on Marginal, Small and Semi-medium farmers respectively. When compared to Marginal farmers semi-medium farmers employed rotavator and cultivator for a longer hours which resulted in higher total cost of cultivation per ha.

Keyword: Pineapple, production cost, Input-output ratio.

1. INTRODUCTION

Pineapple (*Ananas comosus*) is an herbaceous perennial crop belonging to the family Bromeliaceae and is one of the most important commercially grown tropical fruit in the world. Among tropical fruits, pineapple (*Ananas comosus*) is the second most important fruit in the world. The cultivation of pineapple originated in Brazil and gradually spread to other tropical regions of the world. Pineapple mainly contains considerable calcium, carbohydrates, sugars, potassium, fibre, and vitamin A, C and carotene and is low in fat and cholesterol. Pineapple isknown as the queen of the fruits due to its excellent taste and flavour (Vipul *et al.*, 2019). Fresh pineapples are rich in bromelain and used for tenderizing meat which has demonstrated significantly in anti- inflammatory effects, reducing swelling in inflammatory conditions such as acute sinusitis, sore throat, arthritis and gout and speeding recovery from injuries and surgery. The decanter waste of pineapple could be utilised for the preparation of cookies and other food products with improved functional and nutraceutical properties (Zaini *et al.*, 2010). Pineapple grows well in acidic loams, sandy loams, and clay soils and are neutral to slightly acidic soils, with a pH between 4.5 and 6.5. Indian pineapple in the form of canned slices, titbits, juice, and jam are exported to Nepal, UK, Spain, and UAE. During the year 2002-03, India produced 1.17 million tonnes of pineapples from about 79846 hectare of land. Some of the major pineapple producing states in India are Assam, West Bengal, Manipur, Nagaland, Arunachal Pradesh, Karnataka, Kerela, Meghalaya and Bihar (Anonymous, 2004).

According to National Horticultural Board, Ministry of Agriculture, Government of India, Pineapple fruit crop in India is contributing nearly 10% of the world pineapple production (Bidhan *et al.*,2017).

The north-east region of India produces about 49% of the total pineapple of the country. While pineapple is one of the most important leading fruits cultivated in 11 districts of Nagaland, out of that Dimapur district is in the highest area as well as productivity, I e, yield 11870 kg/ha, more than70% of pineapple fruit is cultivated under rain feed condition and nearly 60% pineapple area is having high productivity (more than 32% of the total production comes from high productivity groups) (Amod *et al.*,2016*).* In various districts of Nagaland pineapples are grown very well, the fruit is of high quality having TSS of about 12-15°brix, and a large size weighing about 1.5 to 2.5 kg having an attractive colour and taste. The most common varieties of pineapple grown in Nagaland are Kew, giant Kew and Mauritius.

Research Methodology

Sampling procedure

1st stage selection of districts

2nd selection of block

3rd selection of villages

4th selection of farmers/ respondents

Selection of districts

Out of 17 districts present in the state of Nagaland, Tseminyu district was selected purposively, because of its major contribution towards the state's pineapple production. The district topography also favours the cultivation of pineapple as the soil and climate are best suited for the cultivation of pineapple.

Selection of block

There are only 1 block in the district. so Tseminyu block was selected purposively for this study because of its climatic conditions and production of pineapple and moreover it was easily accessible for the researcher to visit the block. Based on pineapple cultivation for the study the size of the land holding farmers were classified into different groups.

Marginal farmers : 0-1 hectare

Small farmers : 1-2 hectare

Semi-medium farmers : 2-4 hectare

Medium farmers : 4-10 hectare

Large farmers : above 10 hectare

Selection of Villages

A complete list of all the villages was prepared with the help of Block Development Officer. Tsonsa, Nsunyu, Ehunnu, Ziphenyu, Tesophenyu and New Tesophenyu villages were selected randomly for this study.

Selection of sample respondents

A comprehensive records of all individuals who cultivate pineapple was obtained from KVK. Subsequently, the individuals were sorted in ascending order based on their pineapple cultivation practices and then categorised into different groups based on their cultivation.

Analysis of data:

Measures of cost concept

The different cost items that are included under each cost concept are detailed below with their procedures.

- Plantation cost: land preparation (Pit digging + layout) + cost of plant +planting material + Tools and other input.
- Fixed cost: Land revenue + Depreciation + Interest on fixed capital + Plantation cost+ Rental value of land.
- Variable cost:- Cost of input used including labour + Interest on Working capital + Maintenance cost
- Maintenance cost:- After the establishment cost pineapple grower incur expenditure year regular basis for the maintenance.

- **Total cost** = Fixed cost + variable cost

Measures of Farm profitability

Gross income = per quintal price X yield per hectare in quintal

Net income = Gross income – Cost C

Input output ratio (cost benefit ratio) = Cost C - Gross income

Table 1. Cost of cultivation of pineapple per hectare for Marginal farmers.

Sl. No.	Items of Expenditure	Quantity/ No. of times	Rs/ha
A.	**Operational cost**		
1.	Land preparation		
(i)	Ploughing	1 (3hrs)	2800
(ii)	Rotavator	1 (4 hrs)	3200
(iii)	Cultivator	2 (7hrs)	4900
(iv)	Land clearing	1	2000
2.	Pit preparation and transplanting	1	8000
3.	Fertilizer application	3	2000
4.	Weedicide application	2	700
5.	Irrigation	3	1750
6.	Harvesting	1	5000
7.	Transportation charges	1	1500
Total operational cost			31850
B.	**Material cost**	**No. of units**	
1.	Suckers	10000	18000
2.	FYM	64 qts.	4000
3.	Fertilizers		
(i)	Urea	8 bags	3440
(ii)	SSP	3 bags	2100
(iii)	MOP	3 bags	3300
(iv)	NPK	4 bags	4800
(v)	DAP	4 bags	4700
4.	Weedicide	750gm	750
Total material cost			41090
c.	**Other costs**		
1.	Interest on working capital	@7.5p.a	5470.5
2.	Depreciation		100
Total other cost			5570.5
Total cost (A+B+C)			78510.5

Table 2. Cost of cultivation of pineapple per hectare for Small farmers.

Sl. No.	Items of Expenditure	No. of times	Rs/ha
A.	**Operational cost**		
1.	Land preparation		
(i)	Ploughing	1 (5 hrs)	4000
(ii)	Rotavator	1 (5 hrs)	4000
(iii)	Cultivator	2 (10 hrs)	7000
(iv)	Land clearing	1	3000
2.	Pit preparation and transplanting	1	12000
3.	Fertilizer application	3	2400
4.	Weedicide application	2	1000
5.	Irrigation	3	4500
6.	Harvesting	1	6000
7.	Transportation charges	1	1500
Total operational cost		45,400	
B.	**Material cost**	**No. of units**	
1.	Suckers	12000	21600
2.	FYM	50 qts.	5000
3.	Fertilizers		
(i)	Urea	5bags	3440
(ii)	SSP	3 bags	2100
(iii)	MOP	3 bags	3300
(iv)	NPK	4 bags	5875
(v)	DAP	4bags	6000
4.	Weedicide	2 kg	1000
Total material cost		48,315	
c.	**Other costs**		
1.	Interest on working capital	@7.5p.a	7028.63
2.	Depreciation		250
Total other cost		7278.63	
Total cost (A+B+C)		1,00,993.63	

Table 3. Cost of cultivation of pineapple per hectare for semi-medium farmers.

Sl. No	Items of Expenditure	No. of times	Rs/ha
A.	**Operational cost**		
1.	Land preparation		
(i)	Ploughing	1 (5 hrs)	4000
(ii)	Rotavator	1 (5 hrs)	4000
(iii)	Cultivator	2 (12 hrs)	8400
(iv)	Land clearing	1	3000
2.	Pit preparation and transplanting	1	12500
3.	Fertilizer application	3	2600
4.	Weedicide application	2	2100
5.	Irrigation	3	4500
6.	Harvesting	1	6000
7.	Transportation charges	1	1500
	Total operational cost		48,600
B.	**Material cost**	**No. of units**	
1.	Suckers	12500	22500
2.	FYM	100 qts.	6000
3.	Fertilizers		
(i)	Urea	9 bags	3870
(ii)	SSP	3 bags	2100
(iii)	MOP	3 bags	3300
(iv)	NPK	6 bags	7050
(v)	DAP	5 bags	6000
4.	Weedicide	1.2 kg	1200
	Total material cost		52,020
c.	**Other costs**		
1.	Interest on working capital	@7.5p.a	7546.5
2.	Depreciation		500
	Total other cost		8046.5
	Total cost (A+B+C)		1,08,666.5

The data revealed that per ha cost of cultivation of pineapple Rs.78510 which included Rs 31850 operational cost and Rs. 41090 material cost. The highest investment was done in

fertilizers (Rs. 18340) and suckers (Rs. 18000) per ha. The cost of cultivation estimated per ha for pineapple by small farmers was Rs. 100993.63. The operational cost amounted to Rs. 45400 and the material cost was determined to be Rs. 48315. For small farmers, the major portion of investment was attributed to suckers and fertilizers and the cost of cultivation per ha for pineapple in case of semi-medium farmers was Rs. 108666.5 in which the operational cost and material cost was calculated to be Rs. 48600 and Rs. 52020 respectively. The expenditure of semi- medium farmers were found to be higher in inputs like fertilizers, manure and suckers.

Table 4. Profitability in cultivation of Pineapple.

Sr no	Particular	Size of farm Groups			Average
		Marginal	Small	Semi Medium	
1	Production (No. of units)	6500	7200	9700	7800
2	Total Cost (Rs)	78510.5	1,00,993.63	1,08,666.5	96,056.8
3	Gross Return (Rs)	132000	163000	182800	159266.6
4	Net Return (Rs)	53489.5	62006.37	74133.5	63209.7
5	Benefit Cost Ratio (B.C Ratio)	1:1.68	1:1.61	1:1.68	1:1.65

In this research overall estimated Gross Return of pineapple was Rs/ha 159266.6 and obtained Net Return was Rs/ha 63209.7. The benefit received on per rupee investment was 1:1.65. Across farm size of holdings, the Gross Return of Pineapple was varied from Rs/ha 132000 to Rs/ha 182800 of Marginal to semi-medium farmers. The obtained Net Return was ranging from Rs/ha 53489.5 to Rs/ha 74133.5 of Marginal to semi-medium farmers. The Benefit-Cost ratio was 1:1.68, 1:1.61 and 1:1.68 for Marginal, Small and Semi-medium farmers respectively. The average of Net Return was found to be Rs 63209.6 per hectare. It is conforming from the findings that semi-medium farmers were more efficient than that of small and marginal farmers because of good management and supervision in cultivation of pineapple.

Conclusion

The study of production of pineapple in Tseminyu district, Nagaland, revealed some interesting findings. The total cost of production of pineapple is Rs.78510.5, Rs. 1,00,993.63 and Rs.1,08,666.5 for Marginal, Small and Semi-medium farmers respectively and the estimated net return was higher for small and semi-medium farmers when compared to marginal farmers owing to the fact that they made a higher expenditure onquality suckers and yield enhancing resources like manure and fertilizers. Due to availability of resources, small and semi-medium farmers applied irrigation more number of times as opposed to marginal farmers who were mostly dependent on rainfall for irrigation purposes. From this it is clear that semi-medium farmers earn more profit than Marginal and Small farmers.

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