



# Analysis of Cost and Returns of the Pineapple Cultivation in Manipur

Ningombam Anandkumar Singh\*, Ram Singh, S.M. Feroze, Rajkumar Josmee Singh

School of Social Sciences, College of Post Graduate Studies, Central Agricultural University, Barapani 793103, Meghalaya

### ARTICLE INFO

#### Article history:

Received 10 December 2015

Revision Received 19 December 2015

Accepted 20 December 2015

#### Key words:

Cost concept, Gross return, Pineapple,  
Cost-Benefit ratio

### ABSTRACT

Pineapple is an importance fruit crop in the state of Manipur. Keeping this in view, a study has been conducted on analysis of cost and return of pineapple cultivation in two seasons *i.e.*, summer and winter for the years 2011-12 and 2013-2014 in Manipur. The overall per ha cost of cultivation ( $C_2$ ) of pineapple were estimated to be `54506.65, `24410.46 and `35671.51 in first, second and third year during summer and `9097.83, `15704.08 and `21885.97 during winter season. The Cost  $A_1$  was `40848.60, `13074.37 and `19622.93 in first, second and third year during summer and `2616.91, `7080.67 and `10198.75 during winter season. The Cost  $A_1$ ,  $A_2$  and Cost  $B_1$  were same because none of the respondents have leased in any land and interest on fixed capital in both the season. The Cost  $B_2$  was `46848.60, `19074.37 and `25622.93 in first, second and third year during summer and `8616.91, `13080.67 and `16198.75 during winter season and Cost  $C_1$  was `48506.65, `18410.46 and `29671.51 in first, second and third year during summer and `3097.83, `9704.08 and `15885. during winter season. The gross return was `53436.60 in second year and `92813.72 in third year during summer and `21601.63 and `37470.19 during winter season. The net farm return was highest in second year in both seasons *i.e.*, `57142.20 and `21271.44 compared to the net return in second year *i.e.*, `29026.13 and `8520.96 during summer and winter season. The Cost-Benefit ratio was work out to be 1.23 and 1.24 during summer and winter season.

## 1. Introduction

Among the tropical fruit, pineapple (*Ananas comos*) is the second most important fruit in the world. Cultivation of pineapple was originated in Brazil and gradually spread to the other tropical parts of the world, it's cultivation was introduced to India by Portuguese in 1548 AD (Bender and Bender, 2005). At present worldwide, 85 countries produce near about 23.61 million MT of pineapple. Thailand is the highest pineapple producing country in the world which shares about 11.22 per cent of world pineapple production. India ranked seventh among the pineapple producing country in the world during 2013-14 (GoI, 2014). The state of Manipur is in the second highest state in terms of area coverage under pineapple cultivation and it contributed 7.85% of the total pineapple production of the country.

Out of the major fruits in Manipur, pineapple contribute the highest production to the total fruits production of the state *i.e.*, about 28.72 per cent and it occupied 25 per cent of area of the total fruits area of the state at present (GoI, 2014). Manipur is suitable for the development of horticulture. Besides, there is an ample scope for bringing more land under fruit cultivation in the hill areas. Even in the plains, soil conditions are conducive for production of citrus fruits, banana, guava, peaches, apricot, papaya *etc.* There is sufficient scope for cultivation of pineapples in the medium and high range of the hills in Manipur. For the promotion of healthy growth of horticulture in Manipur, it is essential to develop horticultural marketing.

\*Correspondence author: ningomanand@gmail.com

## 2. Materials and Methods

The present study of the two seasons *i.e.*, summer and winter season has been carried out on the basis of primary data collected from the study area. Thoubal, Bishnupur, Saikhul and Samulamlan block of Thoubal, Bishnupur, Senapati and Churhandpur district has been chosen purposively, as it covers a majority of the area under pineapple cultivation in the district. Eleven villages were selected randomly from the four blocks. From each block 30 numbers of respondents were selected randomly. Total 120 numbers of respondents were selected randomly from the four blocks for the study and categorised into three categories *viz*, small (up to 0.58 ha), medium (0.59 to 1.13 ha) and large (1.14 ha and above). The necessary data from selected farmers were collected through a pre-tested schedule by personal interview method. Different cost concepts were estimated and tabular analysis was done to obtain the results and draw conclusions regarding the present study. The reference years of the study were 2011-12 and 2013-14. A summary of Cost concepts used in the present study is as follows:

### Cost A<sub>1</sub>:

- i) Value of hired human labour
- ii) Value of hired bullock labour
- iii) Value of owned bullock labour
- iv) Value of owned machinery labour
- v) Value of hired machinery charges
- vi) Value of seedling (both farm produced and purchased)
- vii) Value of insecticides and pesticides
- viii) Value of manure (owned and purchased)
- ix) Value of fertilizer

- x) Depreciation on implements and farm buildings
- xi) Irrigation charges
- xii) Land revenue, assets, cesses and other taxes
- xiii) Interest on working capital
- xiv) Miscellaneous expenses (Artisans *etc.*)

**Cost A<sub>2</sub>:** Cost A<sub>1</sub> + rent paid for leased in land

**Cost B<sub>1</sub>:** Cost A<sub>1</sub> + interest on value of owned fixed capital assets (excluding land)

**Cost B<sub>2</sub>:** Cost B<sub>1</sub> + rental value of owned land less land revenue + rent paid for leased in land

**Cost C<sub>1</sub>:** Cost B<sub>1</sub> + imputed value of family labour

**Cost C<sub>2</sub>:** Cost B<sub>2</sub> + imputed value of family labour

### For returns analyse; following measures were used

- i. Gross Farm income (GFI) = Value of main product + Value of by product
- ii. Net return including family labour = GFI – Total cost including family labour
- iii. Net return excluding family labour = GFI – Total cost excluding family labour
- iv. Farm business income = GFI – Cost A<sub>2</sub>
- v. Family level income = GFI – Cost B<sub>2</sub>
- vi. Net farm income = GFI – Cost C<sub>2</sub>
- vii. Farm investment income = Farm business income – wages of family labour

## 3. Results and Discussions

### Cost and returns in summer season

It is evident from Table 1 that the establishment cost of large farm was found to be higher than small and medium farm,

**Table 1.** Establishment cost of pineapple orchard on different size of farms (₹/ha)

Item of cost	Category of pineapple orchard			
	Small	Medium	Large	Overall
Preparation of land and layout	3677.49 (10.72)	5314.05 (12.78)	7111.30 (12.47)	4574.43 (11.61)
Digging and filling of pit	10086.74 (29.40)	12086.72 (29.07)	16766.91 (29.40)	11555.43 (29.32)
Fencing	1387.45 (4.04)	2343.60 (5.64)	3758.78 (6.59)	1966.25 (4.99)
Gap filling	1089.92 (3.18)	1277.54 (3.07)	1795.13 (3.15)	1239.48 (3.14)
Plantation	5092.52 (14.84)	6772.76 (16.29)	9532.13 (16.71)	6150.52 (15.78)
Planting material (seedling)	12978.66 (37.83)	13788.89 (33.16)	18067.61 (31.68)	13931.06 (34.76)
<b>Total</b>	<b>34312.78</b> <b>(100.00)</b>	<b>41583.56</b> <b>(100.00)</b>	<b>57031.86</b> <b>(100.00)</b>	<b>39417.16</b> <b>(100.00)</b>

Note: Figures in parentheses are the percentage of the total

and it was estimated as `57031.86, `34312.78 and `41,583.56 per ha, respectively. Cost of planting material (seedlings) was the major cost item for all the categories of pineapple orchard. It was accounted to be 37.83, 33.16 and 31.68 per cent of the total establishment cost of small, medium and large farms of pineapple, respectively. The second important cost item in all the categories was digging and filling of pit and followed by plantation, preparation of land and layout, fencing and gap filling. From the Table 2 to 5 shown that during summer season the total three years Cost ( $C_2$ ) of pineapple cultivation was `99775.73 in small, `120316.77 in medium and `150843.72 in large categories. The Cost  $C_2$  incurred was found to be less in the second year of the orchard in the entire farm category *i.e.*, first year cost was `47683.59, second year was `21746.60 and third year was `30345.53 in small category, `58071.73, `26592.59, `35652.45 in medium and `77011.32, `31967.47 and `31967.47 in large farm. The total three years of Cost  $A_1$  for pineapple cultivation was worked out to be 64.59, 65.48 and 68.08 per cent in small, Medium and large category of the total cost of cultivation in which first, second and third year was accounted to be 74.91, 52.99 and 56.69 per cent in small category, 74.34, 53.21 and 60.21 per cent in medium category and 75.72, 55.61 and 63.53 per cent in large category, respectively. In all the category of pineapple orchard Cost  $A_1$ , Cost  $A_2$  and Cost  $B_1$  have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Total three years Cost  $B_2$  was estimated to be 82.63, 80.44 and 80.01 per cent in small, medium and large category and 87.49, 80.58 and 76.47 and 77.86 per cent in large category, respectively. Cost  $C_1$  worked to be 81.96, 85.04 and 88.07 per cent of total three year cost in small, medium and large category and in first year 87.42, in second year 72.41 and in third year 80.23 per cent in small category, 89.67, 77.44 and 83.17 per cent in medium and 92.21, 81.23 and 85.67 per cent in large category, respectively. The total three year variable cost was contributed 81.67, 84.73 and 87.73 per cent of the total three year cost of cultivation of small, medium and large category. The share of variable cost was found to be higher in first year comparative to second and third year in the entire farm category *i.e.*, 87.29, 72.00 and 79.78 per cent of the total cost of cultivation in first, second and third year of small category, 89.50, 76.98 and 82.73 per cent in medium category and 92.04, 80.66 and 85.21 per cent in large category, respectively. Among the total three years variable cost items, hire labour was the major cost item in all the farm category, which share 43.74, 46.00 and 48.13 per cent of the total three year cost in small, medium and large category. In first year 42.43, in second year 48.35 and in third year 42.50 per cent in small category, 45.17, 48.22 and 45.70 per cent in medium category and 46.68,

50.29 and 49.16 per cent in large category, respectively. The next important cost item was the family labour in all the farm category *i.e.*, 17.37, 19.56 and 19.99 per cent of the total three year cost in small, medium and large category, respectively. In first year 12.51, in second year 19.42 and in third year 23.53 per cent in small category, 15.32, 24.23 and 22.96 per cent in medium category and 16.49, 25.62 and 22.14 per cent in large category, respectively. The other variable cost items like manures and fertilizers, planting material (seedling) and interest on working capital together shared 20.56, 19.17 and 19.61 per cent of the total three year cost of cultivation in small, medium and large category, respectively. The total three year fixed cost was shared 18.33, 15.27 and 12.27 per cent of the total cost of cultivation in small, medium and large category, respectively. Among total three year fixed cost items, rental value of own land was the major cost item in entire farm category and followed by depreciation. The total three year gross income was found to be `120111.45, `167989.61 and `219893.41 in small, medium and large category, respectively in which there was no return in the first year. In all the farm category, the return was started from the second to third year *i.e.*, `40508.03 and `79603.42 in small, `66568.46 and `101421.15 in medium and in large farm category `86160.02 and `133733.39 in second and third year, respectively. The total three year net farm income was estimated that `20335.72, `47672.84 and `69049.68 in small, medium and large category, respectively. In small farm category, the net return in first, second and third year were ` -47683.59, `18761.43 and `49257.89, in medium farm category ` -58071.73, `39975.87 and `65768.70 and in large farm category ` -77011.32, `54192.55 and `91868.45, respectively. Total three year net return including and excluding family labour were found out that `20335.72 and `37662.45 in small, `47672.84 and `71200.82 in medium and `69049.68 and `99203.84, respectively. In first, second and third year net return including and excluding were estimated that ` -47683.59, `18761.43, `49257.89 and ` -41720.58, `22983.82, `56399.20 in small farm category, ` -58071.73, `39975.87, `65768.70 and ` -58071.73, `46419.75, `73953.42 in medium farm category and ` -77011.32, `54192.55, `91868.45 and ` -64315.78, `62383.97, `101135.65 in large farm category. Total three year farm business income was found out to be `55662.45, `89200.82 and `117203.84 in small, medium and large farm category, respectively. In first, second and third year farm business income was estimated as ` -35720.58, `28983.82 and `62399.20 in small, ` -43172.34, `52419.75 and `79953.42 in medium and ` - in medium and ` -58315.78, `68383.97 and `107135.65 in large farm category, respectively. Total three years Cost  $C_2$  of pineapple cultivation was found out to be `114588.63 in overall. The Cost  $C_2$  incurred was found to be less in the second year of the orchard in the overall farm *i.e.*, first year cost was `54506.65,

**Table 2.** Cost and return from pineapple cultivation for small category of pineapple orchard during summer season  
(₹/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	20232.08 (42.43)	10513.92 (48.35)	12896.96 (42.50)	43642.96 (43.74)
Family labour	5963.02 (12.51)	4222.39 (19.42)	7141.32 (23.53)	17326.72 (17.37)
Manures and fertilizers	-	-	2747.26 (9.05)	2747.26 (2.75)
Planting material (seedling)	12978.86 (27.22)	-	-	12978.86 (13.01)
Interest on working capital @ 6.25%	2448.37 (5.13)	921.02 (4.24)	1424.10 (4.69)	4793.49 (4.80)
<b>Total variable cost</b>	<b>41622.33</b> (87.29)	<b>15657.32</b> (72.00)	<b>24209.64</b> (79.78)	<b>81489.30</b> (81.67)
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (12.58)	6000.00 (27.59)	6000.00 (19.77)	18000.00 (18.04)
Depreciation	61.26 (0.13)	89.28 (0.41)	135.90 (0.45)	286.44 (0.29)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6061.26</b> (12.71)	<b>6089.28</b> (28.00)	<b>6135.90</b> (20.22)	<b>18286.44</b> (18.33)
<b>Cost A1</b>	35720.58 (74.91)	11524.22 (52.99)	17204.22 (56.69)	64449.01 (64.59)
<b>Coat A2</b>	35720.58 (74.91)	11524.22 (52.99)	17204.22 (56.69)	64449.01 (64.59)
<b>Cost B1</b>	35720.58 (74.91)	11524.22 (52.99)	17204.22 (56.69)	64449.01 (64.59)
<b>Cost B2</b>	41720.58 (87.49)	17524.22 (80.58)	23204.22 (76.47)	82449.01 (82.63)
<b>Cost C1</b>	41683.59 (87.42)	15746.60 (72.41)	24345.53 (80.23)	81775.73 (81.96)
<b>Cost C2</b>	47683.59 (100.00)	21746.60 (100.00)	30345.53 (100.00)	99775.73 (100.00)
ton/ha	-	3.38	6.63	10.01
<b>Gross farm income (GFI)</b>	-	40508.03	79603.42	120111.45
<b>Net return including family labour</b>	-47683.59	18761.43	49257.89	20335.72
<b>Net return excluding family labour</b>	-41720.58	22983.82	56399.20	37662.45
<b>Farm business income</b>	-35720.58	28983.82	62399.20	55662.45
<b>Family labour income</b>	-41720.58	22983.82	56399.20	37662.45
<b>Net farm income</b>	-47683.59	18761.43	49257.89	20335.72
<b>Farm investment income</b>	-35720.58	28983.82	62399.20	55662.45

Note: Figure in parenthesis are the percentage of the total.

**Table 3.** Cost and return from pineapple cultivation for medium category of pineapple orchard during summer season  
(/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	26229.31 (45.17)	12822.51 (48.22)	16292.79 (45.70)	55344.61 (46.00)
Family labour	8899.39 (15.32)	6443.88 (24.23)	8184.72 (22.96)	23527.99 (19.56)
Manures and fertilizers	-	-	3282.87 (9.21)	3282.87 (2.73)
Planting material (seedling)	13788.48 (23.74)	-	-	13788.48 (11.46)
Interest on working capital @ 6.25%	3057.32 (5.26)	1204.15 (4.53)	1735.02 (4.87)	5996.50 (4.98)
<b>Total variable cost</b>	<b>51974.51</b> (89.50)	<b>20470.53</b> (76.98)	<b>29495.40</b> (82.73)	<b>101940.44</b> (84.73)
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (10.33)	6000.00 (22.56)	6000.00 (16.83)	18000.00 (14.96)
Depreciation	97.22 (0.17)	122.06 (0.46)	157.05 (0.44)	376.33 (0.31)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6097.22</b> (10.50)	<b>6122.06</b> (23.02)	<b>6157.05</b> (17.27)	<b>18376.33</b> (15.27)
<b>Cost A1</b>	43172.34 (74.34)	14148.71 (53.21)	21467.73 (60.21)	78788.79 (65.48)
<b>Coat A2</b>	43172.34 (74.34)	14148.71 (53.21)	21467.73 (60.21)	78788.79 (65.48)
<b>Cost B1</b>	43172.34 (74.34)	14148.71 (53.21)	21467.73 (60.21)	78788.79 (65.48)
<b>Cost B2</b>	49172.34 (84.68)	20148.71 (75.77)	27467.73 (77.04)	96788.79 (80.44)
<b>Cost C1</b>	52071.73 (89.67)	20592.59 (77.44)	29652.45 (83.17)	102316.77 (85.04)
<b>Cost C2</b>	58071.73 (100.00)	26592.59 (100.00)	35652.45 (100.00)	120316.77 (100.00)
ton/ha	-	5.55	8.45	14.00
<b>Gross farm income (GFI)</b>	-	66568.46	101421.15	167989.61
<b>Net return including family labour</b>	-58071.73	39975.87	65768.70	47672.84
<b>Net return excluding family labour</b>	-49172.34	46419.75	73953.42	71200.82
<b>Farm business income</b>	-43172.34	52419.75	79953.42	89200.82
<b>Family labour income</b>	-49172.34	46419.75	73953.42	71200.82
<b>Net farm income</b>	-58071.73	39975.87	65768.70	47672.84
<b>Farm investment income</b>	-43172.34	52419.75	79953.42	89200.82

Note: Figure in parenthesis are the percentage of the total.

second year was ₹24410.46 and third year was ₹35671.51, respectively. The total three years of Cost A<sub>1</sub> for pineapple cultivation was worked out to be 64.18 per cent of the total cost of cultivation in which first, second and third year was accounted to be 74.94, 53.56 and 55.01 per cent, respectively. In overall farm, Cost A<sub>1</sub>, Cost A<sub>2</sub> and Cost B<sub>1</sub> have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Total three years Cost B<sub>2</sub> was estimated to be 79.89 per cent in which 85.95, 78.14 and 71.83 per cent in first, second and third year, respectively. Total three year Cost C<sub>1</sub> was estimated that 84.29 per cent in which 88.99, 75.42 and 83.18 per cent in first, second and third year, respectively. The total three year variable cost was contributed 83.99 per cent of the total three year cost of cultivation. The share of variable cost was found to be higher in first year comparative to second and third year in the entire farm category *i.e.*, 88.85, 74.97 and 82.76 per cent of the total cost of cultivation. Among the total three years variable cost items, hire labour was the major cost item which share 44.15 per cent of the total three year cost and in first year 44.01, in second year 48.70 and in third year 41.26 per, respectively. The next important cost item was the family labour contributed 20.11 per cent of the total three year cost and in first year 14.05, in second year 21.86 and in third year 28.17 per cent, respectively. Similar finding was found by Sarkar and Rahim (2008), the variable cost of pineapple cultivation was the major share of the total cost of pineapple cultivation. And also a study conducted by Rani *et al.*, (1997) in Visakhapatnam district of Andhra Pradesh revealed that payment towards human labour and suckers were the major item of variable costs expenditure of pineapple cultivation. The other variable cost items like manures and fertilizers, planting material (seedling) and interest on working capital together shared 19.73 per cent of the total three year cost of cultivation.

The total three year fixed cost was shared 16.01 per cent of the total cost of cultivation. Among total three year fixed cost items, rental value of own land was the major cost item in entire farm category and followed by depreciation. The total three year gross income was found to be ₹146250.32 in overall farm and there was no return in the first year. The return was started from the second to third year *i.e.*, ₹53436.60 and ₹92813.72, respectively. The total three year net farm income was estimated that ₹31661.69 and in first, second and third year were ₹-54506.65, ₹29026.13 and ₹57142.20, respectively. Total three year net return including and excluding family labour were found out that ₹31661.69 and ₹54704.41, respectively. In first, second and third year net return including and excluding were estimated that ₹-54506.65, ₹29026.13,

₹57142.20 and ₹-46848.60, ₹34362.22, ₹67190.79, respectively. Here, the net returns from the pineapple cultivation were observed to be increased over the year in all the farm category. Similar result was reported by Rymbai *et al.*, (2012), Hatai *et al.*, 2013), Kichu *et al.*, (2014) and Rani *et al.*, (1997) in which they reported pineapple as a profitable crop. Total three year farm business income was found out to be ₹72704.41 and in first, second and third year farm business income was estimated as ₹-40848.60, ₹40362.22 and ₹73190.79, respectively. Total three year of family labour income was work out to be ₹54704.41 and in first, second and third year of family labour income was ₹-46848.60, ₹34362.22 and ₹67190.79, respectively. The total three year of farm investment income was estimated that ₹72704.41 and in first, second and third year it was ₹-40848.60, ₹40362.22 and ₹73190.79, respectively. The benefit cost ratio was found out to be 1.16, 1.34 and 1.40 in small, medium and large far category, respectively (Table 10).

#### **Cost and returns in winter season**

From the Table 7 to 10 shown that during winter season the total three years Cost (C<sub>2</sub>) of pineapple cultivation was ₹41578.27 in small, ₹47888.30 in medium and ₹55338.83 in large categories. The Cost C<sub>2</sub> incurred was found to be less in the second year of the orchard in the entire farm category *i.e.*, first year cost was ₹8451.12, second year was ₹14260.56 and third year was ₹18866.58 in small category, ₹9690.30, ₹16903.42, ₹21294.58 in medium and ₹10834.91, ₹19772.92 and ₹24731.01 in large farm. The total three years of Cost A<sub>1</sub> for pineapple cultivation was worked out to be 41.61, 45.47 and 49.85 per cent in small, Medium and large category of the total cost of cultivation in which first, second and third year was accounted to be 24.70, 43.74 and 47.57 per cent in small category, 32.20, 45.32 and 51.63 per cent in medium category and 37.02, 48.78 and 56.33 per cent in large category, respectively. In all the category of pineapple orchard Cost A<sub>1</sub>, Cost A<sub>2</sub> and Cost B<sub>1</sub> have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Total three years Cost B<sub>2</sub> was estimated to be 84.90, 83.06 and 82.38 per cent in small, medium and large category and 95.70, 85.81 and 79.37 per cent in first, second and third year in small category, 94.11, 80.81 and 79.81 per in medium category and 92.40, 79.12 and 80.59 per cent in large category, respectively. Cost C<sub>1</sub> worked to be 56.71, 62.41 and 67.47 per cent of total three year cost in small, medium and large category and in first year 29.00, in second year 57.93 and in third year 68.20 per cent in small category, 38.08, 64.50 and 71.82 per cent in medium and 44.62, 69.66 and 75.74 per cent in large category, respectively.

**Table 4.** Cost and return from pineapple cultivation for large category of pineapple orchard during summer season  
(₹/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	35948.96 (46.68)	16076.74 (50.29)	20580.37 (49.16)	72606.07 (48.13)
Family labour	12695.54 (16.49)	8191.41 (25.62)	9267.20 (22.14)	30154.15 (19.99)
Manures and fertilizers	-	-	3726.27 (8.90)	3726.27 (2.47)
Planting material (seedling)	18067.59 (23.46)	-	-	18067.59 (11.98)
Interest on working capital @ 6.25%	4169.51 (5.41)	1516.76 (4.74)	2098.37 (5.01)	7784.63 (5.16)
<b>Total variable cost</b>	<b>70881.60</b> <b>(92.04)</b>	<b>25784.91</b> <b>(80.66)</b>	<b>35672.21</b> <b>(85.21)</b>	<b>132338.72</b> <b>(87.73)</b>
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (7.79)	6000.00 (18.77)	6000.00 (14.33)	18000.00 (11.93)
Depreciation	129.73 (0.17)	182.56 (0.57)	192.73 (0.46)	505.01 (0.33)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6129.73</b> <b>(7.96)</b>	<b>6182.56</b> <b>(19.34)</b>	<b>6192.73</b> <b>(14.79)</b>	<b>18505.01</b> <b>(12.27)</b>
<b>Cost A1</b>	58315.78 (75.72)	17776.05 (55.61)	26597.73 (63.53)	102689.57 (68.08)
<b>Coat A2</b>	58315.78 (75.72)	17776.05 (55.61)	26597.73 (63.53)	102689.57 (68.08)
<b>Cost B1</b>	58315.78 (75.72)	17776.05 (55.61)	26597.73 (63.53)	102689.57 (68.08)
<b>Cost B2</b>	64315.78 (83.51)	23776.05 (74.38)	32597.73 (77.86)	120689.57 (80.01)
<b>Cost C1</b>	71011.32 (92.21)	25967.47 (81.23)	35864.93 (85.67)	132843.72 (88.07)
<b>Cost C2</b>	77011.32 (100.00)	31967.47 (100.00)	41864.93 (100.00)	150843.72 (100.00)
ton/ha	-	7.18	11.14	18.32
<b>Gross farm income (GFI)</b>	-	86160.02	133733.39	219893.41
<b>Net return including family labour</b>	-77011.32	54192.55	91868.45	69049.68
<b>Net return excluding family labour</b>	-64315.78	62383.97	101135.65	99203.84
<b>Farm business income</b>	-58315.78	68383.97	107135.65	117203.84
<b>Family labour income</b>	-64315.78	62383.97	101135.65	99203.84
<b>Net farm income</b>	-77011.32	54192.55	91868.45	69049.68
<b>Farm investment income</b>	-58315.78	68383.97	107135.65	117203.84

Note: Figure in parenthesis are the percentage of the total.

**Table 5.** Cost and return from pineapple cultivation for overall category of pineapple orchard during summer season  
(`/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	23988.97 (44.01)	11887.01 (48.70)	14717.89 (41.26)	50593.87 (44.15)
Family labour	7658.05 (14.05)	5336.09 (21.86)	10048.58 (28.17)	23042.72 (20.11)
Manures and fertilizers	-	-	3019.09 (8.46)	3019.09 (2.63)
Planting material (seedling)	13931.08 (25.56)	-	-	13931.08 (12.16)
Interest on working capital @ 6.25%	2848.63 (5.23)	1076.44 (4.41)	1736.60 (4.87)	5661.67 (4.94)
<b>Total variable cost</b>	<b>48426.73</b> <b>(88.85)</b>	<b>18299.54</b> <b>(74.97)</b>	<b>29522.16</b> <b>(82.76)</b>	<b>96248.43</b> <b>(83.99)</b>
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (11.01)	6000.00 (24.58)	6000.00 (16.82)	18000.00 (15.71)
Depreciation	79.92 (0.15)	110.92 (0.45)	149.36 (0.42)	340.20 (0.30)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6079.92</b> <b>(11.15)</b>	<b>6110.92</b> <b>(25.03)</b>	<b>6149.36</b> <b>(17.24)</b>	<b>18340.20</b> <b>(16.01)</b>
<b>Cost A1</b>	<b>40848.60</b> <b>(74.94)</b>	<b>13074.37</b> <b>(53.56)</b>	<b>19622.93</b> <b>(55.01)</b>	<b>73545.91</b> <b>(64.18)</b>
<b>Coat A2</b>	<b>40848.60</b> <b>(74.94)</b>	<b>13074.37</b> <b>(53.56)</b>	<b>19622.93</b> <b>(55.01)</b>	<b>73545.91</b> <b>(64.18)</b>
<b>Cost B1</b>	<b>40848.60</b> <b>(74.94)</b>	<b>13074.37</b> <b>(53.56)</b>	<b>19622.93</b> <b>(55.01)</b>	<b>73545.91</b> <b>(64.18)</b>
<b>Cost B2</b>	<b>46848.60</b> <b>(85.95)</b>	<b>19074.37</b> <b>(78.14)</b>	<b>25622.93</b> <b>(71.83)</b>	<b>91545.91</b> <b>(79.89)</b>
<b>Cost C1</b>	<b>48506.65</b> <b>(88.99)</b>	<b>18410.46</b> <b>(75.42)</b>	<b>29671.51</b> <b>(83.18)</b>	<b>96588.63</b> <b>(84.29)</b>
<b>Cost C2</b>	<b>54506.65</b> <b>(100.00)</b>	<b>24410.46</b> <b>(100.00)</b>	<b>35671.51</b> <b>(100.00)</b>	<b>114588.63</b> <b>(100.00)</b>
ton/ha	-	4.45	7.73	12.19
<b>Gross farm income (GFI)</b>	-	53436.60	92813.72	146250.32
<b>Net return including family labour</b>	-54506.65	29026.13	57142.20	31661.69
<b>Net return excluding family labour</b>	-46848.60	34362.22	67190.79	54704.41
<b>Farm business income</b>	-40848.60	40362.22	73190.79	72704.41
<b>Family labour income</b>	-46848.60	34362.22	67190.79	54704.41
<b>Net farm income</b>	-54506.65	29026.13	57142.20	31661.69
<b>Farm investment income</b>	-40848.60	40362.22	73190.79	72704.41

Note: Figure in parenthesis are the percentage of the total.



The total three year variable cost was contributed 56.02, 61.63 and 66.56 per cent of the total three year cost of cultivation of small, medium and large category. The share of variable cost was found to be increase in the increase of the year in the entire farm category *i.e.*, 28.28, 57.30 and 67.48 per cent of the total cost of cultivation in first, second and third year of small category, 37.08, 63.78 and 71.09 per cent in medium category and 43.43, 68.73 and 74.96 per cent in large category, respectively. Among the total three years variable cost items, hire labour was the major cost item in all the farm category, which share 34.95, 38.86 and 42.77 per cent of the total three year cost in small, medium and large category. Similar finding was found by Sarkar and Rahim (2008), the variable cost of pineapple cultivation was the major share of the total cost of pineapple cultivation. And also a study conducted by Rani *et al.*, (1997) in Visakhapatnam district of Andhra Pradesh revealed that payment towards human labour and suckers were the major item of variable costs expenditure of pineapple cultivation. In first year 22.31, in second year 39.74 and in third year 36.99 per cent in small category, 29.01, 40.85 and 41.76 per cent in medium category and 33.27, 43.81 and 46.10 per cent in large category, respectively. The next important cost item was the family labour in all the farm category *i.e.*, 15.10, 16.94 and 17.62 per cent of the total three year cost in small, medium and large category, respectively. In first year 4.30, in second year 14.19 and in third year 20.63 per cent in small category, 5.89, 19.19 and 20.19 per cent in medium category and 7.60, 20.88 and 19.41 per cent in large category, respectively. The other variable cost items like manures and fertilizers and interest on working capital together shared 5.97, 5.83 and 6.17 per cent of the total three year cost of cultivation in small, medium and large category, respectively. The total three year fixed cost was shared 43.98, 38.37 and 33.44 per cent of the total cost of cultivation in small, medium and large category, respectively. Among total three year fixed cost items, rental value of own land was the major cost item in entire farm category and followed by depreciation. The total three year gross income was found to be `54055.73, `61994.81 and `75146.70 in small, medium and large category, respectively in which there was no return in the first year. In the entire farm category, the return was started from the second to third year *i.e.*, `18254.02 and `35801.71 in small, `26284.23 and `35710.58 in medium and in large farm category `28080.01 and `47066.69 in second and third year, respectively. The total three year net farm income was estimated that `12477.46, `14106.50 and `19807.87 in small, medium and large category, respectively. In small farm category, the net return in first, second and third year were `-8451.12, `3993.45 and `16935.13, in medium farm category `-9690.30, `9380.81 and `14416.00 and in large

**Table 6.** Benefit-Cost ratio of pineapple cultivation during summer season

Category	Benefit-Cost ratio
Small	1.16
Medium	1.34
Large	1.40
Overall	1.23

farm category `-10834.91, `8307.09 and `22335.68, respectively. Total three year net return including and excluding family labour were found out that `12477.46 and `18756.66 in small, `14106.50 and `22220.09 in medium and `19807.87 and `29560.73 in large category, respectively. In first, second and third year net return including and excluding were estimated that `-8451.12, `3993.45, `16935.13 and `-8087.43, `6016.33, `20827.75 in small farm category, `-9690.30, `9380.81, `14416.00 and `-9119.80, `12623.75, `18716.15 in medium farm category and `-10834.91, `8307.09, `22335.68 and `-10011.41, `12435.67, `27136.47 in large farm category. Total three year farm business income was found out to be `36756.66, `40220.09 and `47560.73 in small, medium and large farm category, respectively. In first, second and third year farm business income was estimated as `-2087.43, `12016.33 and `26827.75 in small, `-3119.80, `18623.75 and `24716.15 in medium and `-4011.418, `18435.67 and `33136.47 in large category, respectively. Total three year of family labour income was work out to be `18756.66, `22220.09 and `29560.73 in small, medium and large farm category, respectively. In first, second and third year of family labour income was `-8087.43, `6016.33 and `20827.75 in small, `-9119.80, `12623.75 and `18716.15 in medium and `-10011.41, `12435.67 and `27136.47 in large farm category, respectively. The total three year of farm investment income was estimated that `36756.66, `40220.09 and `47560.73 in small, medium and large category, respectively. In first, second and third year it was `-2087.43, `12016.33 and `26827.75 in small, `-3119.80, `18623.75 and `24716.15 in medium and `-4011.41, `18435.67 and `33136.47 in large farm category, respectively. Total three years Cost C<sub>2</sub> of pineapple cultivation was found out to be `46687.89 in overall. The Cost C<sub>2</sub> incurred was found to be increase over the year in the overall farm *i.e.*, first year cost was `9097.83, second year was `15704.08 and third year was `21885.97, respectively. The total three years of Cost A<sub>1</sub> for pineapple cultivation was worked out to be 42.62 per cent of the total cost of cultivation in which first, second and third year was accounted to be 28.76, 45.09 and 46.60 per cent, respectively In overall farm, Cost A<sub>1</sub>, Cost A<sub>2</sub> and

**Table 7.** Cost and return from pineapple cultivation for small category of pineapple orchard during winter season  
(₹/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	1885.59 (22.31)	5667.74 (39.74)	6978.17 (36.99)	14531.50 (34.95)
Family labour	363.70 (4.30)	2022.88 (14.19)	3892.63 (20.63)	6279.20 (15.10)
Manures and fertilizers	-	-	1111.03 (5.89)	1111.03 (2.67)
Planting material (seedling)	-	-	-	-
Interest on working capital @ 6.25%	140.58 (1.66)	480.66 (3.37)	748.86 (3.97)	1370.11 (3.30)
<b>Total variable cost</b>	<b>2389.86 (28.28)</b>	<b>8171.28 (57.30)</b>	<b>12730.69 (67.48)</b>	<b>23291.83 (56.02)</b>
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (71.00)	6000.00 (42.07)	6000.00 (31.80)	18000.00 (43.29)
Depreciation	61.26 (0.72)	89.28 (0.63)	135.90 (0.72)	286.44 (0.69)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6061.26 (71.72)</b>	<b>6089.28 (42.70)</b>	<b>6135.90 (32.52)</b>	<b>18286.44 (43.98)</b>
<b>Cost A1</b>	<b>2087.43 (24.70)</b>	<b>6237.69 (43.74)</b>	<b>8973.96 (47.57)</b>	<b>17299.07 (41.61)</b>
<b>Cost A2</b>	<b>2087.43 (24.70)</b>	<b>6237.69 (43.74)</b>	<b>8973.96 (47.57)</b>	<b>17299.07 (41.61)</b>
<b>Cost B1</b>	<b>2087.43 (24.70)</b>	<b>6237.69 (43.74)</b>	<b>8973.96 (47.57)</b>	<b>17299.07 (41.61)</b>
<b>Cost B2</b>	<b>8087.43 (95.70)</b>	<b>12237.69 (85.81)</b>	<b>14973.96 (79.37)</b>	<b>35299.07 (84.90)</b>
<b>Cost C1</b>	<b>2451.12 (29.00)</b>	<b>8260.56 (57.93)</b>	<b>12866.58 (68.20)</b>	<b>23578.27 (56.71)</b>
<b>Cost C2</b>	<b>8451.12 (100.00)</b>	<b>14260.56 (100.00)</b>	<b>18866.58 (100.00)</b>	<b>41578.27 (100.00)</b>
ton/ha	-	1.52	2.98	4.50
<b>Gross farm income (GFI)</b>	-	18254.02	35801.71	54055.73
<b>Net return including family labour</b>	-8451.12	3993.45	16935.13	12477.46
<b>Net return excluding family labour</b>	-8087.43	6016.33	20827.75	18756.66
<b>Farm business income</b>	-2087.43	12016.33	26827.75	36756.66
<b>Family labour income</b>	-8087.43	6016.33	20827.75	18756.66
<b>Net farm income</b>	-8451.12	3993.45	16935.13	12477.46
<b>Farm investment income</b>	-2087.43	12016.33	26827.75	36756.66

Note: Figure in parenthesis are the percentage of the total.

**Table 7.** Cost and returns from pineapple cultivation for medium category of pineapple orchard during winter season  
(₹/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	2811.23 (29.01)	6904.22 (40.85)	8891.69 (41.76)	18607.14 (38.86)
Family labour	570.50 (5.89)	3242.94 (19.19)	4300.15 (20.19)	8113.59 (16.94)
Manures and fertilizers	-	-	1055.24 (4.96)	1055.24 (2.20)
Planting material (seedling)	-	-	-	-
Interest on working capital @ 6.25%	211.36 (2.18)	634.20 (3.75)	890.44 (4.18)	1736.00 (3.63)
<b>Total variable cost</b>	<b>3593.08 (37.08)</b>	<b>10781.36 (63.78)</b>	<b>15137.53 (71.09)</b>	<b>29511.97 (61.63)</b>
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (61.92)	6000.00 (35.50)	6000.00 (28.18)	18000.00 (37.59)
Depreciation	97.22 (1.00)	122.06 (0.72)	157.05 (0.74)	376.33 (0.79)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6097.22 (62.92)</b>	<b>6122.06 (36.22)</b>	<b>6157.05 (28.91)</b>	<b>18376.33 (38.37)</b>
<b>Cost A1</b>	<b>3119.80 (32.20)</b>	<b>7660.48 (45.32)</b>	<b>10994.42 (51.63)</b>	<b>21774.71 (45.47)</b>
<b>Coat A2</b>	<b>3119.80 (32.20)</b>	<b>7660.48 (45.32)</b>	<b>10994.42 (51.63)</b>	<b>21774.71 (45.47)</b>
<b>Cost B1</b>	<b>3119.80 (32.20)</b>	<b>7660.48 (45.32)</b>	<b>10994.42 (51.63)</b>	<b>21774.71 (45.47)</b>
<b>Cost B2</b>	<b>9119.80 (94.11)</b>	<b>13660.48 (80.81)</b>	<b>16994.42 (79.81)</b>	<b>39774.71 (83.06)</b>
<b>Cost C1</b>	<b>3690.30 (38.08)</b>	<b>10903.42 (64.50)</b>	<b>15294.58 (71.82)</b>	<b>29888.30 (62.41)</b>
<b>Cost C2</b>	<b>9690.30 (100.00)</b>	<b>16903.42 (100.00)</b>	<b>21294.58 (100.00)</b>	<b>47888.30 (100.00)</b>
ton/ha	-	2.19	2.98	5.17
<b>Gross farm income (GFI)</b>	-	26284.23	35710.58	61994.81
<b>Net return including family labour</b>	-9690.30	9380.81	14416.00	14106.50
<b>Net return excluding family labour</b>	-9119.80	12623.75	18716.15	22220.09
<b>Farm business income</b>	-3119.80	18623.75	24716.15	40220.09
<b>Family labour income</b>	-9119.80	12623.75	18716.15	22220.09
<b>Net farm income</b>	-9690.30	9380.81	14416.00	14106.50
<b>Farm investment income</b>	-3119.80	18623.75	24716.15	40220.09

Note: Figure in parenthesis are the percentage of the total.

Cost B<sub>1</sub> have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Total three years Cost B<sub>2</sub> was estimated to be 81.17 per cent in which 94.71, 83.29 and 74.01 per cent in first, second and third year, respectively. Total three year Cost C<sub>1</sub> was estimated that 61.45 per cent in which 34.05, 61.79 and 72.59 per cent in first, second and third year, respectively. The total three year variable cost was contributed 60.72 per cent of the total three year cost of cultivation. The share of variable cost was found to be increase over the year *i.e.*, 33.17, 61.09 and 71.90 per cent of the total cost of cultivation. Among the total three years variable cost items, Here, the net returns from the pineapple cultivation were observed to be increased over the year in all the farm category. Similar result was reported by Rymbai *et al.*, (2012), Hatai *et al.*, (2013), Kichu *et al.*, (2014) and Rani *et al.*, (1997) in which they reported pineapple as a profitable crop. Second year 40.79 and in third year 36.58 per, respectively. The next important cost item was the family labour contributed 18.83 per cent of the total three year cost and in first year 5.29, in second year 16.71 and in third year 25.99 per cent, respectively. The other variable cost items like manures and fertilizers and interest on working capital together shared 5.96 per cent of the total three year cost of cultivation. The total three year fixed cost was shared 39.28 per cent of the total cost of cultivation. Among total three year fixed cost items, rental value of own land was the major cost item in entire farm category and followed by depreciation. The total three year gross income was found to be `59071.82 in overall farm and there was no return in the first year. The return was started from the second to third year *i.e.*, `21601.63 and `37470.19, respectively. The total three year net farm income was estimated that `12383.94 and in first, second and third year were `-9097.83, `5897.55 and `15584.22, respectively. Total three year net return including and excluding family labour were found out that `12383.94 and `21175.49, respectively. In first, second and third year net return including and excluding were estimated that `-9097.83, `5897.55, hire labour was the major cost item which share 35.92 per cent of the total three year cost and in first year 25.93, in `15584.22 and `-8616.91, `8520.96, `21271.44, respectively. Total three year farm business income was found out to be `39175.49 and in first, second and third year farm business income was estimated as `-2616.91, `14520.96 and `27271.44, respectively. Total three year of family labour income was work out to be `21175.49 and in first, second and third year of family labour income was `-8616.91, `8520.96 and `21271.44, respectively. The total three year of farm investment income was estimated that `39175.49 and in first, second and third year it was `-2616.91, `14520.96 and `27271.44, respectively. The benefit cost ratio was found out

to be 1.27, 1.27 and 1.33 in small, medium and large farm category, respectively (Table 10).

## Conclusion

An analysis of cost and returns of pineapple cultivation in Manipur state shown that the cost and returns during summer season was more than winter season. In both seasons, cost and return was increase with the increase the farm size (Rymbai *et al.*, 2013). The benefit cost ratio was more in winter than summer season. The Cost C<sub>2</sub> was `99775.73 in small, `120316.77 in medium and `150843.72 in large categories, respectively. Cost A<sub>1</sub> was 64.59, 65.48 and 68.08 per cent in small, Medium and large category of the total cost of cultivation. In all the category of pineapple orchard Cost A<sub>1</sub>, Cost A<sub>2</sub> and Cost B<sub>1</sub> have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Cost B<sub>2</sub> was estimated to be 82.63, 80.44 and 80.01 per cent in small, medium and large category, respectively and Cost C<sub>1</sub> worked to be 81.96, 85.04 and 88.07 per cent of total three year cost in small, medium and large category, respectively. The cost was increase with the increase the farm size of the pineapple orchard. The gross return was found to be `120111.45, `167989.61 and `219893.41 in small, medium and large category, respectively in which there was no return in the first year in entire farm category and it was started from the second *i.e.*, `40508.03 and `79603.42 in small, `66568.46 and `101421.15 in medium and in large farm category `86160.02 and `133733.39 in second and third year, respectively. The gross return was increase over the year in the entire farm category. The total three year net farm income was estimated that `20335.72, `47672.84 and `69049.68 in small, medium and large category, respectively. The benefit-cost ration was found to be 1.16, 1.34 and 1.40 in small, medium and large far category, respectively. During winter season, the Cost C<sub>2</sub> was `41578.27 in small `47888.30 in medium and `55338.83 in large categories, respectively. Cost A<sub>1</sub> was 41.61, 45.47 and 49.85 per cent in small, Medium and large category of the total cost of cultivation. In all the category of pineapple orchard Cost A<sub>1</sub>, Cost A<sub>2</sub> and Cost B<sub>1</sub> have been worked out to be same because none of the respondents have leased in any land and interest on fixed capital. Cost B<sub>2</sub> was estimated to be 84.90, 83.06 and 82.38 per cent in small, medium and large category, respectively and Cost C<sub>1</sub> worked to be 56.71, 62.41 and 67.47 per cent of total three year cost in small, medium and large category, respectively. The cost was increase with the increase the farm size of the pineapple orchard. The gross return was found to be `54055.73, `61994.81 and `75146.70 in small, medium and large category, respectively in which there was no return in the

**Table 8.** Cost and return from pineapple cultivation for large category of pineapple orchard during winter season

(/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	3604.91 (33.27)	8662.35 (43.81)	11402.02 (46.10)	23669.28 (42.77)
Family labour	823.50 (7.60)	4128.58 (20.88)	4800.79 (19.41)	9752.86 (17.62)
Manures and fertilizers	-	-	1244.99 (5.03)	1244.99 (2.25)
Planting material (seedling)	-	-	-	-
Interest on working capital @ 6.25%	276.78 (2.55)	799.43 (4.04)	1090.49 (4.41)	2166.70 (3.92)
<b>Total variable cost</b>	<b>4705.18 (43.43)</b>	<b>13590.36 (68.73)</b>	<b>18538.28 (74.96)</b>	<b>36833.83 (66.56)</b>
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (55.38)	6000.00 (30.34)	6000.00 (24.26)	18000.00 (32.53)
Depreciation	129.73 (1.20)	182.56 (0.92)	192.73 (0.78)	505.01 (0.91)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	<b>6129.73 (56.57)</b>	<b>6182.56 (31.27)</b>	<b>6192.73 (25.04)</b>	<b>18505.01 (33.44)</b>
<b>Cost A1</b>	<b>4011.41 (37.02)</b>	<b>9644.34 (48.78)</b>	<b>13930.22 (56.33)</b>	<b>27585.97 (49.85)</b>
<b>Coat A2</b>	<b>4011.41 (37.02)</b>	<b>9644.34 (48.78)</b>	<b>13930.22 (56.33)</b>	<b>27585.97 (49.85)</b>
<b>Cost B1</b>	<b>4011.41 (37.02)</b>	<b>9644.34 (48.78)</b>	<b>13930.22 (56.33)</b>	<b>27585.97 (49.85)</b>
<b>Cost B2</b>	<b>10011.41 (92.40)</b>	<b>15644.34 (79.12)</b>	<b>19930.22 (80.59)</b>	<b>45585.97 (82.38)</b>
<b>Cost C1</b>	<b>4834.91 (44.62)</b>	<b>13772.92 (69.66)</b>	<b>18731.01 (75.74)</b>	<b>37338.83 (67.47)</b>
<b>Cost C2</b>	<b>10834.91 (100.00)</b>	<b>19772.92 (100.00)</b>	<b>24731.01 (100.00)</b>	<b>55338.83 (100.00)</b>
tone/ha	-	2.34	3.92	6.26
<b>Gross farm income (GFI)</b>	-	28080.01	47066.69	75146.70
<b>Net return including family labour</b>	-10834.91	8307.09	22335.68	19807.87
<b>Net return excluding family labour</b>	-10011.41	12435.67	27136.47	29560.73
<b>Farm business income</b>	-4011.41	18435.67	33136.47	47560.73
<b>Family labour income</b>	-10011.41	12435.67	27136.47	29560.73
<b>Net farm income</b>	-10834.91	8307.09	22335.68	19807.87
<b>Farm investment income</b>	-4011.41	18435.67	33136.47	47560.73

Note: Figure in parenthesis are the percentage of the total.

**Table 9.** Cost and return from pineapple cultivation for overall category of pineapple orchard during winter season  
(₹/ha)

Particular	Years			Total cost
	I	II	III	
<b>(A) Variable cost</b>				
Hire labour	2359.47 (25.93)	6405.45 (40.79)	8005.60 (36.58)	16770.52 (35.92)
Family labour	480.92 (5.29)	2623.41 (16.71)	5687.22 (25.99)	8791.55 (18.83)
Manures and fertilizers	-	-	1118.11 (5.11)	1118.11 (2.39)
Planting material (seedling)	-	-	-	-
Interest on working capital @ 6.25%	177.52 (1.95)	564.30 (3.59)	925.68 (4.23)	1667.51 (3.57)
<b>Total variable cost</b>	3017.91 (33.17)	9593.16 (61.09)	15736.62 (71.90)	28347.69 (60.72)
<b>(B) Fixed cost</b>				
Rental value of own land	6000.00 (65.95)	6000.00 (38.21)	6000.00 (27.41)	18000.00 (38.55)
Depreciation	79.92 (0.88)	110.92 (0.71)	149.36 (0.68)	340.20 (0.73)
Interest on fixed capital	-	-	-	-
<b>Total fixed cost</b>	6079.92 (66.83)	6110.92 (38.91)	6149.36 (28.10)	18340.20 (39.28)
<b>Cost A1</b>	2616.91 (28.76)	7080.67 (45.09)	10198.75 (46.60)	19896.33 (42.62)
<b>Coat A2</b>	2616.91 (28.76)	7080.67 (45.09)	10198.75 (46.60)	19896.33 (42.62)
<b>Cost B1</b>	2616.91 (28.76)	7080.67 (45.09)	10198.75 (46.60)	19896.33 (42.62)
<b>Cost B2</b>	8616.91 (94.71)	13080.67 (83.29)	16198.75 (74.01)	37896.33 (81.17)
<b>Cost C1</b>	3097.83 (34.05)	9704.08 (61.79)	15885.97 (72.59)	28687.89 (61.45)
<b>Cost C2</b>	9097.83 (100.00)	15704.08 (100.00)	21885.97 (100.00)	46687.89 (100.00)
ton/ha	-	1.80	3.12	4.92
<b>Gross farm income (GFI)</b>	-	21601.63	37470.19	59071.82
<b>Net return including family labour</b>	-9097.83	5897.55	15584.22	12383.94
<b>Net return excluding family labour</b>	-8616.91	8520.96	21271.44	21175.49
<b>Farm business income</b>	-2616.91	14520.96	27271.44	39175.49
<b>Family labour income</b>	-8616.91	8520.96	21271.44	21175.49
<b>Net farm income</b>	-9097.83	5897.55	15584.22	12383.94
<b>Farm investment income</b>	-2616.91	14520.96	27271.44	39175.49

Note: Figure in parenthesis are the percentage of the total.

first year in entire farm category and it was started from the second *i.e.*, `18254.02 and `35801.71 in small, `26284.23 and `35710.58 in medium and in large farm category `28080.01 and `47066.69 in second and third year, respectively.

The gross return was increase over the year in the entire farm category. The total three year net farm income was estimated that `12477.46, `14106.50 and `19807.87 in small, medium and large category, respectively. The benefit-cost ration was found to be 1.27, 1.27 and 1.33 in small, medium and large far category, respectively.

**Table 10.** Benefit-Cost ratio of pineapple cultivation during winter season

Category	Benefit-Cost ration
Small	1.27
Medium	1.27
Large	1.33
Overall	1.24

## References

- Bender and Bender (2005). Pineapple New World Encyclopedia.  
<http://www.newworldencyclopedia.org/entry/Pineapple>. Accessed on 20 March 2014.
- GoI (2014). Indian horticulture Data Base. NHB Government of India.
- Hatai L.D, Naik D (2013). Marketing strategy and supply chain analysis of pineapple: A case study in West Garo Hill of Meghalaya. National Seminar on *Agri-business potentials in North Eastern States Souvenir*, Pp. 24-25. November 8-9.
- Kichu Y, Sharma A (2014). Economics and constraint of pineapple cultivation in Dimapur district of Nagaland. *Agri-Business Potentials in India. Experiences from the Hill States* 217-223.
- Rani S, Devi I.B, Raju V.T (1997). Economic aspects of Pineapple Production in Andhra Pradesh. *Agricultural Situation in India* 450-454.
- Rymbai D, Singh R, Feroze S.M, Rani P.M N and Bardoloi R (2013). Utilization pattern and marketed surplus of pineapple in Ri-Bhoi district of Meghalaya. *Indian Journal of Agricultural Marketing* 27 (2): 35-39.
- Sarkar D, Rahim K (2008). Production Economics and Marketing of Fruits and Vegetables, Pp. 35-39, 71-75,122-124.