Visit us - www.researchjournal.co.in ■ DOI : 10.15740/HAS/IRJAES/8.2/351-356
International Research Journal of Agricultural Economics and Statistics
Volume 8 | Issue 2 | September, 2017 | 351-356 ■ e ISSN-2231-6434

Research Paper

Economic analysis of pineapple production in Sindhudurg district of Maharashtra

■ **SHILPA MATHEW, S.S. WADKAR AND P.J. KSHIRSAGAR**

See end of the paper for authors' affiliations

Correspondence to :
SHILPA MATHEW
Department of Agricultural Economics, College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) INDIA
Email: sagartarang@rediffmail.com

Paper History **:**
Received : *11.05.2017;*
Revised : *08.08.2017;*
Accepted : *15.08.2017*

ABSTRACT : Fruits are nature's wonderful gift to mankind. Pineapple is an important commercial fruit crop with high export value. In this paper, an attempt has been made to study the economic analysis of pineapple production in Sindhudurg district of Maharashtra pertained to the years 2013-16 with a view to analyse resource use pattern, cost and returns and farm business analysis. The study was based on the primary data collected from tenant growers of Dodamarg tahsil in Sindhudurg district. Per hectare physical input utilization pattern indicated that there was higher utilization of inputs such as hired labour, fertilizers and plant protection chemicals. Per hectare cost of cultivation and the net returns amounted to Rs. 588220 and Rs. 993511 for the three years with an overall benefit cost ratio of 2.68. The farm business analysis indicated that the pineapple cultivation was highly profitable in all the three years.

KEY WORDS : Pineapple, Cost, Returns, Resource use, Farm business analysis

HOW TO CITE THIS PAPER : Mathew, Shilpa,Wadkar, S.S. and Kshirsagar, P.J. (2017). Economic analysis of pineapple production in Sindhudurg district of Maharashtra. *Internat. Res. J. Agric. Eco. & Stat.,* **8** (2) : 351-356, **DOI : 10.15740/HAS/IRJAES/8.2/351-356.**

INTRODUCTION :

Agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. India has witnessed voluminous increase in horticulture production over the last few years. Fruits and vegetables account for nearly 90 per cent of the total horticultural production in the country. Fruits are nature's wonderful gift to mankind. Production and consumption of high quality fruits allow us to maintain a healthy, balanced, daily diet. Commercial importance of fruits have been increased all over the world as they contribute significantly to the country's economy besides their social and nutritional importance. Fruit production plays an important role in employment, income generation, export and meets household's nutritional security. Pineapple (*Ananas comosus* L.*)* is one of the commercially important fruit crops of India. In addition to serving as a food, with its natural sweetness the pineapple has served in history as a symbol and an artistic motif. It is also used as an ornamental symbolising, welcome and opulence. The rarity, reputation, visual attractiveness have made pineapple as an ultimate exotic fruit. Pineapple is grown and yields the best in areas with relatively uniform climate year around. Current production remains restricted to the tropical regions of the world. Presently the total global production in the world is 23 MMT which is produced by approximately 80 countries around the world. In India, the leading pineapple producing states are West Bengal (320 thousand tonnes)

followed by Assam (290.21 thousand tonnes), Kerala (255.90 thousand tonnes) and Karnataka (158.12 thousand tonnes).Whereas the productivity is highest for Karnataka (62.49t/ha) followed by West Bengal (29.54 t/ha), Bihar (27.64 t/ha) and Kerala (27.36 t/ha). (Source-Horticultural statistics At A Glance 2015). Maharashtra is one of the prominent horticulture producing state and largest producer of fruits in India. The area under total fruits in the state was (1565 thousand ha) with a production of (13457.9 thousand MT) and productivity (8.6 MT/ha) for the year 2013-14 (Source-National Horticulture Database-2014). Pineapple cultivation and production in Maharashtra is very less compared to other producing states of India.

The specific objectives of the study have been undertaken as follows:

- To assess the existing pattern of resource use in pineapple.

- To estimate cost, returns and profitability of pineapple cultivation.

- To study farm business analysis for pineapple cultivation.

MATERIALS AND METHODS :

For the present study Dodamarg tahsil of the Sindhudurg district was selected purposively as pineapple cultivation is concentrated in the study area and area under this crop is rapidly increasing since the last seven years. The data required for the study were collected by survey method. The detail information needed for the research work was collected from the total available 20 tenant growers with an average per farm leased in land area of 6.91 ha. All the tenant growers were interviewed personally with the help of schedule specially designed for the purpose. The information and data for the present study are pertained to the years 2013-16.

Economics of pineapple production:

The economics of pineapple production for the three years was worked out using the A, B and C cost measures followed by the Commission of Agricultural Cost and Prices (CACP). The A, B and C measures of costs and their components are: Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3.

Cost A_1: Actual paid out cost by the owner cultivator for items like hired labour, hired machinery, suckers, manures, fertilizers, plant protection chemicals, irrigation charges, electricity charges, depreciation on implements and farm buildings and interest on working capital.

Cost A_2: Cost A_1 + rent paid for leased in land.

Cost B_1: Cost A_1 + interest on fixed capital.

Cost B_2: Cost B_1 + rental value of owned land+ rent paid for leased in land.

Cost C_1: Cost B_1 + imputed value of family labour.

Cost C_2: Cost B_2 + imputed value of family labour.

Cost C_3: Cost C_2 + supervision charges.

Since the entire cultivation was carried out in leased in land, the Cost A_2, Cost B_2, Cost C_2 and Cost C_3 measures of cost were used for the computation of per hectare cost of cultivation of pineapple.

Farm business analysis :

The following measures of farm income were used to estimate the income efficiency of selected farms.

Farm business income = Gross income – Cost A_2

Farm investment income= Gross income-(Cost A_2+Value of family human labour)

Family labour income = Gross income – cost B_2

Net income = Gross income-cost C_3.

RESULTS AND DATA ANALYSIS :

The results and data analysis from the present investigation as well as relevant discussion have been summarized under following heads.

Economics of pineapple production:

Per hectare input utilization for pineapple cultivation:

A study of resource use pattern helps to determine the profitability of crop enterprise. The per hectare physical input utilization in pineapple farms for the first, second and third years are presented in Table 1. It is observed from Table 1 that the total labour days utilized for first, second and third years was 800.90 out of which 744.47 days were found to be of hired labour and remaining 56.43 days were constituted by family labour. Since the tenant growers were staying without family in the study area, there was no female labour participation and therefore, the total family labour was constituted by male only. A total of 1387.61 kg, 329.06 kg and 1348.38 kg of N, P_2O_5 and K_2O fertilizers were used for the three years. While comparing level of input utilization in the three years, it can be concluded that inputs like suckers and manures were used lesser than the recommended

level. While in case of fertilizers, there was over utilization in first and second years while the usage was comparatively lesser in the third year. Fungicides and weedicides were also used slightly higher than the recommended dosage. The growth regulator application was in par with the recommendation. Since in second and third year, the fruit bearing is from ratoon of original plant, there was no further planting material utilization in the above years.

The per hectare labour days utilized decreased in second and third year compared to first year since many labour intensive farm establishment operations were only in the first year. Overall per hectare labour utilization was seemed to be higher for the sample farms.

Cost of cultivation of pineapple:

The per hectare cost of cultivation of pineapple was worked out using the standard cost concepts explained in methodology. It is observed from the Table 2 that the total cost of cultivation, Cost C_3 for the first, second and third year was worked out to be Rs. 588220. The item wise maximum cost was incurred on hired labour (34.41%), followed by cost of suckers (12.97%), fertilizers (6.37%), machine hours (4.95%) and manures (3.96%). The per cent of cost of other inputs on total cost of cultivation were, plant protection chemicals (1.99%), irrigation charges (1.43%), electricity charges (0.61%) and growth regulatory hormone (0.21%). The per cent share on interest on working capital was 5.33 per cent and the rent paid for leased in land was about 4.20 per cent. The interest on fixed capital for the first year was higher since the cost of labour (machine and human labour) for establishment operations like land preparation, planting, digging, fencing were also included along with the cost of suckers and value of fixed assets of the cultivators. It is evident from the Table 2 that Cost A_2, Cost B_2, Cost C_2 and Cost C_3 were found to be higher in first year and comparatively lesser in second and third

Table 1: Per hectare input utilization of pineapple

Sr.No.	Input	Unit	1st year	2nd year	3rd year	Total
1.	**Hired labour**					
	Male	Days	184.81	141.13	114.26	440.20
	Female	Days	124.10	94.18	85.99	304.27
2.	**Family labour**					
	Male	Days	20.24	20.49	15.70	56.43
	Female	Days	-	-	-	-
3.	**Total labour**					
	Male	Days	205.05	161.62	129.96	496.63
	Female	Days	124.10	94.18	85.99	304.27
	Total		329.15	255.80	215.95	800.90
4.	**Machine labour**	Hrs	31.78	-	-	31.78
5.	Suckers	No	19074	-	-	19074
6.	Manures	tonnes	19.46	-	-	19.46
7.	**Fertilizer**					
	N	Kg	574.63	548.25	264.73	1387.61
	P_2O_5	Kg	109.49	132.33	87.24	329.06
	K_2O	Kg	535.42	529.67	283.29	1348.38
8.	Fungicides	Kg	2.91	2.40	1.79	7.1
9.	Weedicides	Kg	3.26	3.12	2.67	9.05
10.	Growth regulator	Lit.	0.28	0.32	0.35	0.95
11.	Irrigation charges	Rs.	2716	2967	2730	8413
12.	**Yield**					
	Main produce	Qtls	264.40	286.93	191.01	742.34
	By-produce	No	-	40513	38685	79198

years. This was due to the labour intensive establishment operations and higher input usage in first year.

Economics of pineapple production:

The data on cost and returns from pineapple is presented in the Table 3.The selected tenant growers of the present study attained the first crop yield in the eleventh month after planting. The reason for the same was due to the climate and soil characteristics of the study area which favoured early maturation of the crop

Table 2: Per hectare cost of cultivation of pineapple

Sr.No.	Particulars	1st year	2nd year	3rd year	Total
1.	Hired labour				
	Male	60433 (18.68)	46149 (31.75)	33776 (28.29)	140358 (23.86)
	Female	25316 (7.82)	19213 (13.21)	17542 (14.69)	62071 (10.55)
2.	Machine hrs.	29174 (9.01)	-	-	29174 (4.95)
3.	Suckers	76296 (23.58)	-	-	76296 (12.97)
4.	Manures	23352 (7.21)	-	-	23352 (3.96)
5.	Fertilizers				
	N	3161(0.97)	3838 (2.64)	1853 (1.55)	8852 (1.50)
	P_2O_5	1204 (0.37)	1588 (1.09)	1047 (0.87)	3839 (0.65)
	K_2O	9638 (2.97)	9534 (6.55)	5666 (4.74)	24838 (4.22)
6.	Plant protection chemicals	4320 (1.33)	4074 (2.80)	3312 (2.77)	11706 (1.99)
7.	Growth regulatory hormones	373 (0.11)	426 (0.29)	465 (0.38)	1264 (0.21)
8.	Irrigation charges	2716 (0.83)	2967 (2.04)	2730 (2.28)	8413 (1.43)
9.	Electricity charges	1266 (0.39)	1205 (0.82)	1105 (0.92)	3576 (0.61)
	Input cost	237249 (73.33)	88994 (61.22)	67496 (56.53)	393739 (66.93)
10.	Depreciation on machinery and implements	9365 (2.89)	9365 (6.44)	9365 (7.84)	28095 (4.77)
11.	Interest on working capital @ 12 per cent.	12615(3.89)	10679 (7.34)	8099 (6.78)	31393 (5.33)
12.	Rent paid for leased in land	7638 (2.36)	7638 (5.25)	9464 (7.92)	24740 (4.20)
	Cost A_2	266867 (82.49)	116676 (80.27)	94424 (6.78)	477967 (81.25)
13.	Interest on fixed capital @ 10 per cent	26284 (8.12)	13072 (8.99)	13072 (10.94)	52428 (8.91)
	Cost B_2	293151(90.62)	129748 (89.26)	107496 (90.04)	530395 (90.16)
14.	Family human labour				
	Male	6619 (2.04)	6700(4.60)	5133(4.30)	18452 (3.13)
	Female	-	-	-	-
	Cost C_2	299770 (92.66)	136448 (93.87)	112629 (94.34)	548847 (93.30)
15.	Supervision charges	23725 (7.33)	8899 (6.12)	6749 (5.65)	39373 (6.69)
16.	Cost C_3	323495(100.00)	145347(100.00)	119378(100.00)	588220(100.00)
	Per quintal cost	1223	224	220	579
17.	Yield				
	Main produce (q)	264.40	286.93	191.01	742.34
	By-produce (No)	-	40513	38685	79198
18.	Total returns (Rs.)				
	Main produce (q)	462700	559514	401121	1423335
	By-produce (No)	-	81026	77370	158396
	Total	462700	640540	478491	1581731

Figures in the parentheses indicate percentage to cost C_3

along with proper cultivation practices followed by the pineapple tenant growers.The total gross income amounted to Rs. 1581731. The total net returns for the three years at Cost A_2 was Rs.1103764, Cost B_2 was Rs. 1051336, Cost C_2 Rs. 1032884 and Cost C_3 Rs. 993511. The net returns at Cost C_3 was Rs. 139205 in first year, Rs. 495193 in second year and Rs. 359113 in third year. The net returns were found to be higher in second and third years due to the lesser cost incurred in the above years. The overall benefit-cost ratio was 2.68. The first and second ratoon enabled the cultivators to attain higher returns when compared to the first year production.

Farm business analysis :

It is observed from the Table 4, the various income measures computed on per hectare basis for ascertaining the profitability of pineapple cultivation in the three years. The gross income from main produce and by-produce was Rs.1423335 and Rs.158396. The total farm business income and farm investment income amounted to Rs. 1085312 and Rs. 1085312. The family labour income was worked out to be Rs. 169549, Rs. 510792 and Rs. 370995 in the three years, respectively. The total net income was amounted to Rs. 993511. The four income measures attained maximum values in second year. This was due to the higher yield procured from first ratoon and better market price availed by farmers.

Conclusion :

Overall per hectare labour utilization was seemed to be higher for the sample farms. The per hectare cost of cultivation, Cost C_3 was worked out to Rs. 588220 for the three years out of which the total labour cost accounted to 42.51 per cent and remaining 57.49 per cent was constituted by material cost. The net returns was calculated to be Rs. 993511 with an overall benefit cost ratio of 2.68. The total gross return was amounted to be Rs. 1581731 for the three years. The study revealed that pineapple cultivation was highly profitable for the farmers at all costs *i.e.* at Cost A_2, Cost B_2, Cost C_2 and Cost C_3 particularly in second and third year. The high

Table 3: Per hectare economics of pneapple production

Sr. No.	Particulars	1st year	2nd year	3rd year	Total
1.	Gross returns	462700	640540	478491	1581731
2.	Costs				
	Cost A_2	266867	116676	94424	477967
	Cost B_2	293151	129748	107496	530395
	Cost C_2	299770	136448	112629	548847
	Cost C_3	323495	145347	119378	588220
3.	Net returns				
	Cost A_2	195833	523864	384067	1103764
	Cost B_2	169549	510792	370995	1051336
	Cost C_2	162930	504092	365862	1032884
	Cost C_3	139205	495193	359113	993511
4.	Benefit-cost ratio	1.43	4.41	4.00	
	Overall benefit-cost ratio		2.68		

Table 4: Farm business analysis

Sr.No.	Particulars	1st year	2nd year	3rd year	Total
	Gross income-main produce	462700	559514	401121	1423335
	Gross income-by-produce	-	81026	77370	158396
	Total	462700	640540	478491	1581731
1.	Farm business income	195833	523864	384067	1103764
2.	Farm investment income	189214	517164	378934	1085312
3.	Family labour income	169549	510792	370995	1051336
4.	Net income	139205	495193	359113	993511

consumer demand and good quality of produce favoured the farmers in securing better price for the fruits throughout the production period. The benefit-cost ratio was worked out to be 1.43 in first year, 4.41 in second year and 4.00 in the third year. The overall benefit-cost ratio was 2.68. The first and second ratoon enabled the pineapple growers to attain higher returns when compared to the first year production. The four measures of income showed a rising trend in second and third year with respect to first year. This was mainly due to the absence of farm establishment operations especially land preparation, digging and planting in second and third years. The above results indicated the profitability of horticultural fruit production and marketing.

Authors' affiliations:
S.S. WADKAR AND P.J. KSHIRSAGAR, Department of Agricultural Economics, College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, RATNAGIRI (M.S.) INDIA

LITERATURE CITED :

Hiremath, L.B. (2005). Economics of production and processing of fruits and vegetables. *Indian J. Agric. Mktg.*, **1**(6):21-26.

Islam, M.A. (1998). An economic analysis of pineapple production in Madhupur Thana under Tangail district. M.Sc. (Ag.) Thesis, Bangladesh Agricultural University, Mymensingh.

Jose, V.C. (1993). Feasibility of pineapple as an intercrop in small holdings of rubber in Muvattupuzha taluka. M.Sc. (Ag.) Thesis, Kerala Agricultural University, Thrissur, KERALA (INDIA).

Mishra, J.P., Singh, R.I. and Singh, G.N. (1976). Study of farm business analysis in district Basti (U.P).*Rural India*, **40** (2-3): 43 .

OlayinkaIsaika, Baruwa (2013). Profitability and constrains of pineapple production in Osun state, Nigeria. *J. Hort. Res.*, **21** (2) : 59-64.

Padmini, T.S. (2002). Problem and prospects of pineapple cultivation in Kerala. University of Kerala, Trivandrum, KERALA (INDIA).

Rymbai, D., Singh, R. and Feroze, S.M. (2012). Benefit costs ratio of pineapple orchard in Meghalaya. *Indian J. Hill Farm.*, **25** (1) : 9-12.

Thomas, J.M. (2015). Return and efficiency of intercrop pineapple cultivation in Kerala, Ph.D. Thesis, Cochin University of Science and Technology.