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Apple Cultivation in Kullu District of Himachal Pradesh: A Cost Analysis

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study entitled "Apple cultivation in Kullu district of Himachal Pradesh: A cost analysis" has been carried out in two selected blocks i.e Banjar and Naggar of Kullu District in Himachal Pradesh by taking representative samples of 70 farmers. The farmers having less than one hectare of land were placed in group of marginal farmers, 1-2 ha as small, 2-4 ha as semi medium and more than 4 ha as Medium farmers. Distributions of the samples were done accordingly to their apple holding size. Establishment cost on per farm on the basis and per hectare basis has been worked out to from Rs 23678 and Rs 261932 respectively for overall farms. A total cost of plantation for marginal, small, semi medium and medium farms were 13660.33, 21333.86, 37136.03 and 91808.68 rupees respectively. Whereas, it can be said that the marginal area consuming trees show less price contribution than that of the medium farms which contributes much higher economy to the district financial infrastructure.

Keywords: *Establishment; economics; apple cultivation.*

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1. INTRODUCTION

Horticulture sector has emerged as a driving force for agricultural development in India. The sector is the most profitable venture for all farming activities, as it provides ample employment opportunities and scope to raise income of the farming community in the country. Besides this, the sector has tremendous potentials to push overall agricultural growth above the country's targeted 4 per cent level [1]. Realizing these potentials, the government of India has started putting greater thrust for the development of horticultural sector after sixties in order to exploit the country's vast potential and generated the additional values. Greater emphasis have been made on development initiatives of this sector in the country as a result of which, the country has registered itself as the second largest producer of fruits and vegetables in the world, next to China.

Horticulture development in Himachal Pradesh is an economic necessity. Horticulture sector in the state has made remarkable contributions in the up-liftment of the socio-economic conditions of the farming community. The niche advantages for fruits have in the past been exploited by the growers, wherever natural conditions, socio-economic and institutional environments were favorable. The state of Himachal Pradesh being primarily is a temperate hilly state & known for the production of commercial temperate fruits crops [2] that includes apple, peach, plum and apricot, walnut, strawberry and cherry etc. Amongst this apple is grown in the largest area and most preferred by the fruit growers in the state [3].

Kullu district of the Himachal Pradesh has become famous for production of apple. During the last three decades, Kullu has made tremendous progress in the field of horticulture. Greater emphasis is being laid down on this sector because geographical features and climatic conditions prevailing in the district are ideal for fruit farming. Among all the fruits grown in Kullu, apples are most widely grown and represent commercially the most important fruit crop of the district. The area under cultivation of apple in Kullu district has increased significantly from 8573 ha during (1975-1976) to 25825 ha in (2013-2014) and apple production has increased from 62931

Metric ton (MT) in (1975-1976) to 122400 MT in (2013-2014) [4].

Quite a few studies have been conducted in the past on the economic aspect of production and marketing of apples in the state, but apple industry is well established and dynamic in character, hence there has been a need to revalidate the economic indicators from time to time.

2. METHODOLOGY

Purposive sampling was adopted to select the study area i.e. Kullu district of Himachal Pradesh. This area was selected because of its significant contribution with respect to area and production of apple in the state, simultaneously providing fruitful employment to the families involved in apple cultivation. At the first stage 2 blocks namely Banjar and Naggar blocks were selected on the basis of highest area under apple by adopting probability proportion method. At the second stage 5 villages from each block were randomly selected. At the third stage a sample of about 7 apple growers from each selected village were selected by adopting probability proportion method in such a way that the total samples of the respondents were restricted to about 70. For the analysis of data the total respondents were divided into four classes according to the size of their land holdings, viz., marginal (<1 ha), small (1-2 ha), Semi medium (2-4 ha) and Medium farmers (>4 ha). The distribution of the sample apple growers are varying from each other according to their holding size.

3. RESULTS AND DISCUSSION

Item wise establishment cost on marginal farms has been presented in the Table 1. It has been clear from the table that, apple orchardists in marginal farms incurred on an average, a total cost of Rs. 13660.33 in the year of plantation. Cost incurred on operations like layout, digging and filling of pits and irrigation averaged nearly 25 of the total cost and cost incurred on fertilizer, and planting material averaged nearly 31 per cent of the total cost. Managerial cost and risk margin each accounted for 4.62 per cent of the total cost. Rental value of land shared 31.67 per cent of the total cost. Per hectare establishment cost for marginal was worked out to be Rs 294403.72. Same study was conducted by [5].

Table 1. Establishment cost of apple orchard on marginal farms

Sr. No	Particulars	Material cost		Labour cost		Total cost (Rs)	Percentages
		Quantity (No./kgs)	Value (Rs)	Mandays	Value (Rs)		
1	Layout and preparatory operations			1.14	400.05	400.00	(2.93)
2	Digging of pits			3.21	1125.00	1125.00	(8.24)
3	Filling of pits(Soil & Farm Yard Manure-FYM)	351.36	451.71	2.07	725.00	1176.71	(8.61)
4	Fertilizer	10.21	464.53	0.79	275.00	739.53	(5.41)
5	Irrigation			1.64	575.00	575.00	(4.21)
6	Cost of plants & planting cost	35.00	2820.00	2.07	725.00	3545.00	(25.95)
7	Interest on working capital @ 4%					302.45	(2.21)
8	Managerial cost @ 10% of working capital					631.12	(4.62)
9	Risk margin @ 10% of working capital					631.12	(4.62)
10	Land revenue and taxes					2.43	(0.02)
11	Annual depreciation					151.14	(1.11)
12	Interest on fixed capital @ 7.5%					54.26	(0.40)
13	Rental value of owned land					4326.56	(31.67)
14	Total cost					13660.33	(100.00)
						294403.72*	

Figure in the parenthesis show percentages to the total

*On per hectare basis

Table 2. Establishment cost of apple orchard on small farms

Sr. No.	Particulars	Material cost		Labour cost		Total cost (Rs)	Percentages
		Quantity (No./kgs)	Value (Rs)	Mandays	Value (Rs)		
1	Layout and preparatory operations			1.05	367.50	367.50	(1.72)
2	Digging of pits			3.70	1295.00	1295.00	(6.07)
3	Filling of pits(Soil & FYM)	481.50	619.10	3.15	1102.50	1721.60	(8.07)
4	Fertilizer	14.10	722.75	1.00	350.00	1072.75	(5.03)
5	Irrigation			2.20	770.00	770.00	(3.61)
6	Cost of plants & planting cost	46.15	3525.50	2.30	805.00	4330.50	(20.30)
7	Interest on working capital @ 4%					382.314	(1.79)
8	Managerial cost @ 10% of working capital					771.98	(3.62)
9	Risk margin @ 10% of working capital					771.98	(3.62)

Sr. No.	Particulars	Material cost		Labour cost		Total cost (Rs)	Percentages
		Quantity (No./kgs)	Value (Rs)	Mandays	Value (Rs)		
10	Land revenue and taxes					5.412	(0.03)
11	Annual depreciation					149.12	(0.70)
12	Interest on fixed capital					55.07	(0.26)
13	Rental value of owned land					9640.12	(45.18)
14	Total cost					21333.86	(100.00)
						277784.64*	

Figure in the parenthesis show percentages to the total
*On per hectare basis

Table 3. Establishment cost of apple orchard on semi medium farms

Sr. No	Particulars	Material cost		Labour cost		Total cost (Rs)	Percentages
		Quantity (No./kg)	Value (Rs)	Mandays	Value (Rs)		
1	Layout and preparatory operations			1.11	388.50	389.00	(1.06)
2	Digging of pits			5.00	1750.00	1295.00	(3.53)
3	Filling of pits(Soil & FYM)	627.78	807.22	3.77	1319.50	2126.72	(5.80)
4	Fertilizer	20.00	1030.44	1.55	542.50	1572.94	(4.29)
5	Irrigation			1.89	661.50	661.50	(1.80)
6	Cost of plants & Planting cost	62.78	4888.89	2.77	969.50	5858.39	(15.98)
7	Interest on working Capital @ 4%					476.14	(1.30)
8	Managerial cost @ 10% of working capital					933.20	(2.55)
9	Risk margin @ 10% of working capital					933.20	(2.55)
10	Land revenue and taxes					12.43	(0.03)
11	Annual depreciation					186.13	(0.51)
12	Interest on fixed capital @ 7.5%					69.87	(0.19)
13	Rental value of owned land					22148.30	(60.41)
14	Total cost					37136.03	(100.00)
						230945.44*	

Figure in the parenthesis show percentages to the total
*On per hectare basis

Table 4. Establishment cost of apple orchard on medium farms

Sr. No.	Particulars	Material cost		Labour cost		Total cost (Rs)	Percentages
		Quantity (No./kgs)	Value (Rs)	Mandays	Value (Rs)		
1	Layout and preparatory operations			3.50	1225.00	1225.00	(1.45)
2	Digging of pits			23.50	8225.00	1295.00	(1.53)
3	Filling of pits (Soil & FYM)	2500.00	3213.50	13.00	4550.00	7763.50	(9.18)
4	Fertilizer	25.00	1288.00	1.00	350.00	1638.00	(1.94)
5	Irrigation			3.50	1225.00	770.00	(0.91)
6	Cost of plants & planting cost	250.00	13500.00	14.00	4900.00	18400.00	(21.75)
7	Interest on working capital @ 4%					1243.66	(1.47)
8	Managerial cost @ 10% of working capital					3077.65	(3.64)
9	Risk margin @ 10% of working capital					3077.65	(3.64)
10	Land revenue and taxes					25.71	(0.03)
11	Annual depreciation					207.31	(0.25)
12	Interest on fixed capital @ 7.5%					78.50	(0.09)
13	Rental value of owned land					45799.49	(54.12)
14	Total cost					91808.68	(100.00)
						221546.05*	

Figure in the parenthesis show percentages to the total

**On per hectare basis*

Table 5. Average establishment cost of apple orchard farms

Sr. No.	Particulars	Material cost		Labour cost		Total cost	Percentages
		Quantity (No./kgs)	Value (Rs)	Mandays	Value(Rs)		
1	Layout and preparatory operations			1.20	421.04	421.29	(1.78)
2	Digging of pits			4.55	1593.07	1593.07	(6.73)
3	Filling of pits(Soil & FYM)	537.08	690.51	3.22	1127.96	1818.46	(7.68)
4	Fertilizer	13.88	688.35	1.00	349.18	1037.53	(4.38)
5	Irrigation			1.98	691.66	691.66	(2.92)
6	Cost of plants & planting cost	52.88	3874.95	2.78	973.21	4848.15	(20.47)
7	Interest on working capital @ 4%					416.41	(1.76)
8	Managerial cost @ 10% of working capital					837.77	(3.54)
9	Risk margin @ 10% of working capital					837.77	(3.54)
10	Land revenue and taxes					6.15	(0.03)
11	Annual depreciation					158.26	(0.67)
11	Interest on fixed capital @7.5%					58.07	(0.25)
12	Rental value of owned land					10954.10	(46.25)
13	Total cost					23678.68	(100.00)
						261932.35*	

Figure in the parenthesis show percentages to the total

*On per hectare basis

Table 6. Establishment cost of apple orchard on per farm and per hectare basis

Farm size	Establishment cost per farm	Establishment cost per hectare
Marginal	13660.33	294403.72
Small	21333.86	277784.67
Semi medium	37136.03	230945.44
Medium	91808.68	221546.05
Average	23678.68	261932.35

Item wise establishment cost on small farms has been presented in the table 2. It is clear from the table that, apple orchardists on small farms incurred on an average, a total cost of Rs. 21333.86 in the year of plantation out of which layout, digging and filling of pits and irrigation averaged nearly 20 of the total cost and cost incurred on fertilizer and planting material averaged nearly 25 per cent of the total cost. Managerial cost and risk margin each accounted for 3.62 per cent of the total cost. Rental value of land shared 45.19 per cent of the total cost. Per hectare establishment cost for small farms was worked out to be Rs 277784.64. Same study was conducted by [6].

Item wise establishment cost on semi medium farms has been presented in the table 3. It is clear from the table that, apple orchardists on semi medium farms incurred on an average, a total cost of Rs. 37136.03 in the year of plantation. Cost incurred on operations like layout, digging and filling of pits and irrigation averaged nearly 12.19 of the total cost and cost incurred on fertilizer and planting material averaged nearly 20.27 per cent of the total cost. Managerial cost and risk margin each accounted for 2.55 per cent of the total cost. Rental value of land shared 60.41 per cent of the total cost. Per hectare establishment cost for semi medium farms was worked out to be Rs 230945.44. Same study was conducted by [7].

Item wise establishment cost on medium farms has been presented in the table 4. It is clear from the table that, apple orchardists on medium farms incurred on an average, a total cost of Rs. 91808.68 in the year of plantation. Cost incurred on operations like layout, digging and filling of pits and irrigation averaged nearly 13.07 of the total cost and cost incurred on fertilizer and planting material averaged nearly 23.69 per cent of the total cost. Managerial cost and risk margin each accounted for 3.64 per cent of the total cost. Rental value of land shared 54.14 per cent of the total cost. Per hectare establishment cost for medium farms was worked out to be Rs 221546.05. Same study was conducted by [8].

Item wise average establishment cost on farms has been presented in the table 5. It is clear from the table that, apple orchardists on farms incurred on an average, a total cost of Rs. 23678.68 in the year of plantation. Cost incurred on operations like layout, digging and filling of pits and irrigation averaged nearly 19.11 of the total cost and cost incurred on fertilizer and planting material averaged nearly 25 per cent of the total cost. Managerial cost and risk margin each accounted for 3.54 per cent of the total cost. Rental value of land shared 46.26 per cent of the total cost. Per hectare average establishment cost for farms was worked out to be Rs 261932. Same study was conducted by [9,10].

Table 6 shows that establishment cost on per hectare basis was found to be maximum on marginal category i.e. Rs 294403 and minimum on medium category farms i.e. Rs 221546.05 and average establishment cost per hectare was found to be Rs 261932.35.

4. CONCLUSION

The average level of Rs 23678 brings up from the total farming zone of apple. Establishment cost was found to be higher on medium farms and lower on the marginal farms. Per hectare average establishment cost for farms was worked out to be Rs 261932.35. The highest cost per farms especially of marginal category is i.e. 294403.72/ hectare.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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