

COST OF CULTIVATION OF POTATO IN SABARKANTHA DISTRICT OF GUJARAT STATE

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ABSTRACT

The present study entitled “Cost of cultivation of potato in Sabarkantha district of Gujarat state” was undertaken to calculate the cost of production of potato based on data collected from 126 farmers selected from 6 randomly selected villages and 30 market functionaries in two market areas namely Idar and Modasa of Sabarkantha district of Gujarat state. The study pertaining to the agricultural year 2013-14 and data were collected by survey method. The average cost of cultivation for potato crop in Sabarkantha district, which was Rs. 95594.24 per hectare. Among total expense seeds contributed about 40.36 per cent of total cost. Total cost of family labours decreased with increase in size of farms. But the labour requirement was more in potato production, so the percentage of hired human labour cost increased with increase in size of farms. The net return over Cost A and Cost C₂ was Rs. 120160.42 and Rs. 105038.09 per hectare, respectively.

KEY WORDS: Cultivation. Potato, Sabarkantha, Economics

INTRODUCTION

Potatoes (*Solanum tuberosum* L.) belong to the family *Solanaceae* is one of the most popular vegetables grown all over the world. It can be rightly called as the “King of Vegetables”. It is assumed that at the beginning of the 17th century the Portuguese navigators first brought potatoes in India. The first record about the cultivation of potatoes in India is seen in the year 1847 in the issues of “The Gardening Monthly,” a magazine published from London. Initially, potatoes was cultivated in areas around Calcutta, from there it's

cultivation spread to Cherapunjee. By the 19th century, potatoes were widely grown throughout the country (Marwaha *et al.*, 2003).

The average consumption of potatoes in many countries of the world viz., Netherlands, Russia, China, Belgium, France and Canada varies from 50 to 175 kg of tubers *per capita* per annum, both as fresh and processed, whereas in India, it is less than 15 kg. Our diet consists of nearly 2.5 per cent of potatoes. In several industrially advanced countries of Europe and America, 50 to 60 per cent of the daily diets are

derived from potatoes (<http://www.faostat.fao.org>). In India, an average person eats nearly 40 g of raw potatoes per day which provides about 45 calories or only about one fiftieth equivalent ($1/50^{\text{th}}$) of the daily energy requirement (2200 cal. per day) (<http://www.fao.org>).

Potato is a winter crop with very high yield potentiality as compared to other food crops. It is an efficient food producer and has the potential to become a supplementary staple food besides cereals in the country. The nutritional qualities of potatoes often go unrecognized by as many people have myths about potatoes being only a source of starch contributing to weight and obesity. But potatoes almost completely lacks fats or has it in a very low amount (0.1-0.2 %), a substance with twice the calorie value of carbohydrates. Potatoes can thus be consumed in much larger quantities without running the risk of becoming fat (Chadha, 1994). Potato is one of the most important and popular vegetables available throughout the year in all parts of India. Potato is an ideal crop that is highly efficient in converting sunlight into nutritious food.

MATERIALS AND MATHODS

This study was carried out in Sabarkantha district of Gujarat State. The reasons for selecting this district are, 1). Potato is important vegetable as well as cash crop for Gujarat State, 2). The Sabarkantha district ranks second in terms of area under potato cultivation in Gujarat state, and 3). It is the most profitable crop for this area. Potato cultivation in the state of Gujarat is largely concentrated to Banaskantha, Sabarkantha, Gandhinagar, Mehsana and Kheda. Hence, Sabarkantha district was selected purposively based on its accessibility and relevance of the study (Table 1 and Table 2). For this study, two taluka Modasa and Idar were selected purposively, where high potential and

production of potatoes is practiced. Three villages from each selected taluka were selected randomly. Total of six villages were selected for the study. From each selected villages, 21 farmers were selected by sampling method. Thus, a total of 126 farmers were selected for this study.

Both primary data and secondary data were collected for the study from the selected farmers, the primary data were collected on the area covered by potato, cost incurred in inputs, cost of cultivation, prices received, the quantity sold, the output, net profit earned and cold storage information, etc. This information was collected through personal interviews with the farmers with the help of pre-tested schedule for the year 2013-14. Similarly, relevant information on the quantity of potato brought for processing, transportation cost, investment cost, raw materials used for processing, output of processed potato, the quantity sold, prices received, net profit earned and value added due to processing, etc., were obtained from the selected processors through personal interviews with the help of pre-tested schedules for the year 2013-14. Secondary data on area, production, yield and price of potato for Sabarkantha district and Gujarat were obtained from published reports and official records of the Directorate of Economics and Statistics Bureau, Gujarat; Central Potatoes Research Institute, Shimla; Main Potato Research Station, Deesa and Directorate of Horticulture, Gandhinagar.

The data collected regarding the cost of cultivation of potato for the year 2013-2014 from selected samples of farmers. The techniques used in calculating cost of cultivation was simple average, tabular analysis and weighted average adopted for identifying and comparing output, price and net profit of selected farmers, according to their size of farms and for the whole district.

The cost concept that has been used in farm management studies such as Cost-A and Cost-B. Cost-C₁ and Cost-C₂ was covered in the analysis. The input items included for various cost concepts are as under:

Cost-A: Hired human labour, bullock labour, manures, chemical fertilizer, seeds, insecticides and pesticide, miscellaneous cost and interest on working capital.

Cost-B: Cost-A + Rental value of own land + Interest on own fixed capital

Cost-C₁: Cost-B + Value of family laborers

Cost-C₂: Cost-C₁ + 10 % of Cost-C₁ as management charges.

RESULTS AND DISCUSSION

Cost of cultivation of potato

The studies on cost of cultivation in an area not only furnishes information on the relative profitability of the enterprises, but also serves as a guide for better choice and combinations of farm input for maximizing returns. The cost of cultivation of potato mainly depends on the major inputs used, techniques of cultivation, yield and prices for major inputs. Profit depends on sale price and yield obtained. Since this crop involves heavy investment, it is an expensive crop for small and medium farmers. Generally, farmers do not take into account their fixed capital, depreciation cost of owned fixed implements and machinery, etc., presented on farms. They generally count Cost - A only, which includes only operational cost. But in this study, the Cost - A, Cost - B, Cost - C₁ and Cost - C₂ were calculated from the Sabarkantha district of Gujarat State, where the farmers possess more knowledge about the potato crop.

The cost of cultivation per hectare of potatoes with different sizes of farm is presented in Table 4 and graphically depicted in Figure 1. The average cost of cultivation of potatoes was estimated Rs. 95594.24 per hectare. As for input items

about 50.37 per cent cost was in the form of seed (i.e., 40.36 %) and human labour (i.e., 10.01 %). The remaining cost (i.e., 52.57 %) was distributed between other items such as fertilizers, bullock labour, irrigation, manures and rental value of owned land accounting for 13.39, 1.59, 1.69, 5.67 and 3.79 per cent of the total cost, respectively. The gross income for average farmer was Rs. 200632.33 per hectare and net income was Rs.105038.09 per hectare over Cost C₂.

The share of seed cost in all the farm categories was higher due to higher price of potatoes seed, but in the studied area during 2013-14, the price of seed was high ranging from Rs. 1600 to Rs.1800 per quintal. Total cost of cultivation of potato for small farmers was higher as compared to medium and large size farmers because 61.23 per cent of total cost of cultivation was contributed by major input like seed, human labour and fertilizer, which was 39.34, 9.47 and 12.42 per cent, respectively. The cost of cultivation for small size group of farmers was estimated Rs. 100592.91.

The per cent of share of seed in medium farmers was estimated 41.63 per cent of the total cost followed by large farmers (40.10 %) and small farmers (39.34 %). The irrigation charges, interest on working capital and interest on fixed capital were also higher in case of small farmers. It may be observed that the cost of family labour (2.74 %) was higher in case of large farmers, while share of hired human labour was higher for large farmers (7.67 %) and medium (7.46 %) as against only (6.78 %) for small farmers. Per cent of hired labour increased with the increase in the size of farms. Similar results were found by Jadav (2007) for vegetables. This trend was due to the fact that small farmers mostly depend on their family labour for farm operations, while large farmers have to depend on hired labour for completing farm operations. Thus, it was clear that the large size of farms

got more returns than medium and small size farms. The result corroborate with the findings of Bakshi and Banerjee (1983).

The net income over different costs presented in Table 5 indicated that the Cost-A, was lower for large farmer (Rs. 76924.22 per hectare) than rest of the farmer groups. Generally, farmers always count operational cost and get profit from Cost-A. It was observed that higher net return per hectare was earned by medium farmers (Rs. 114656.57 per hectare). Net income over Cost-A was the highest for medium farmers (Rs. 129663.82 per hectare) followed by small farmers (Rs. 112926.66 per hectare) and large farmers (Rs. 117890.78 per hectare). It was also concluded that small, medium and large farmers earned an income Rs. 97137.09, Rs. 114656.57 and Rs. 103320.62 per hectare over Cost C₂, respectively. The net income over total cost i.e., Cost-C₂ increased with increase in the size of farms. The result of increase in net income with the increase in size of farm was in close conformity with the findings of Bakshi and Banerjee (1983) and Gupta *et al.* (1984).

CONCLUSION

From the results and discussion, it can be concluded that the average cost of cultivation for potato crop in Sabarkantha district, which was Rs. 95594.24 per hectare. Among total expense seeds contributed about 40.36 per cent of total cost. Total cost of family labours decreased with increase in size of farms. But the labour requirement was more in potato production, so the percentage of hired human labour cost

increased with increase in size of farms. The net return over Cost A and Cost C₂ was Rs. 120160.42 and Rs. 105038.09 per hectare, respectively.

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Table 1: Area, production and productivity of potato in Gujarat

Year	Area (‘000 ha)	Production (‘000 tones)	Yield (kg/ha)
2000-01	320	7048	22025
2001-02	328	7161	21860
2002-03	323	8020	24846
2003-04	358	7800	21791
2004-05	332	8213	24466
2005-06	305	8214	26931
2007-08	723	17956	24835
2008-09	558	11714	20993
2009-10	474	9877	20833
2010-11	551	12827	23279
2011-12	778	17923	23030
2012-13	715	17892	25024

Table 2: Area, production and productivity of potato in Sabarkantha district

Year	Area (‘000 ha)	Production (‘000 tones)	Yield (kg/ha)
2000-01	21	374	17914
2001-02	37	817	21918
2002-03	34	606	17887
2003-04	34	630	18466
2004-05	38	879	23235
2005-06	41	1044	23594
2007-08	135	2799	20692
2008-09	76	1363	17928
2009-10	58	758	12972
2010-11	88	1682	19076
2011-12	147	2921	19809
2012-13	91	2343	25843

Table 3: Distribution of selected farmers in two talukas of Sabarkantha district

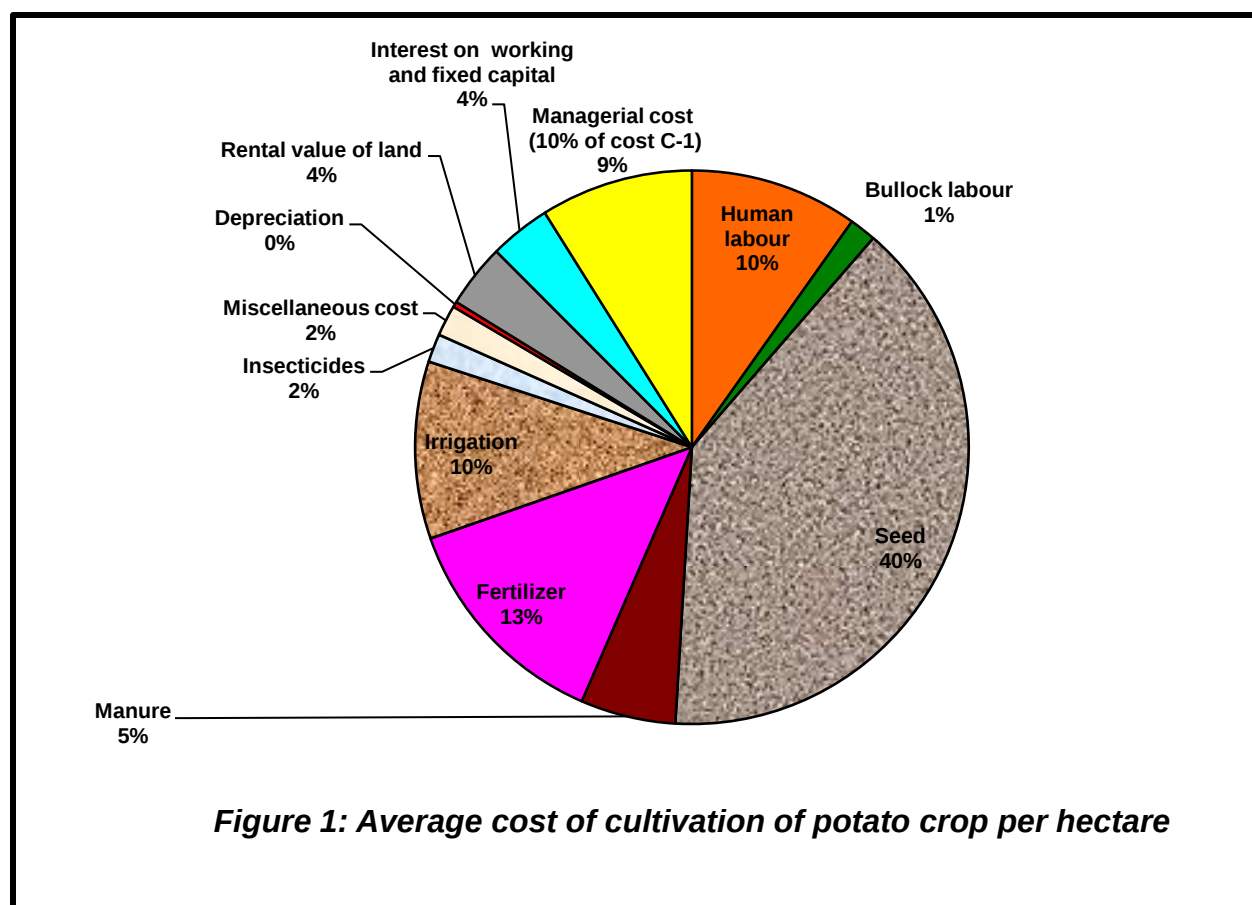
Taluka	Selected Village	Number of Selected Farmers			
		Small	Medium	Large	Total
Idar	Bhajpura	7	7	7	21
	Chotasan	7	7	7	21
	Kadiyadra	7	7	7	21
Modasa	Khadoda	7	7	7	21
	Medhasan	7	7	7	21
	Sardoi	7	7	7	21
Total		42	42	42	126

Table 4: Details of cost of cultivation of potato crop per hectare

Particular	Small Farmers			Medium Farmers			Large Farmers			Overall Farmers		
	Physical Unit	Value (Rs.)	Total Cost (%)	Physical Unit	Value (Rs.)	Total Cost (%)	Physical Unit	Value (Rs.)	Total Cost (%)	Physical Unit	Value (Rs.)	Total Cost (%)
Hired labour (man days)	44.33	6826.82	6.78	45.90	7068.60	7.46	45.58	7019.32	7.67	45.27	6971.58	7.30
Bullock power (pair days)	3.26	1551.76	1.54	3.23	1537.48	1.62	3.13	1489.88	1.62	3.21	1526.37	1.59
Seed (kg)	2152.17	39579.74	39.34	2144.09	39429.82	41.63	1995.38	36695.18	40.10	2097.21	38568.25	40.36
Manures (kg)	13.52	5230.00	5.19	14.24	5509.86	5.81	14.21	5498.39	6.00	13.99	5412.75	5.67
Fertilizers (kg)	N	156.23	12498.87	158.22	12906.75	13.62	159.28	12926.71	14.12	157.91	12777.44	13.39
	P	88.45		89.13			90.06			89.21		
	K	151.32		153.59			154.34			153.08		
Plant protection charges	-	1540.70	1.53	-	1620.00	1.71	-	1668.40	1.82	-	1609.70	1.69
Irrigation charges	-	12390.70	12.31	-	8963.14	9.46	-	9076.25	9.92	-	10143.36	10.56
Miscellaneous charges	-	1609.87	1.60	-	1728.18	1.82	-	1955.64	2.13	-	1764.56	1.85
Interest on working capital	-	3249.14	3.22	-	3150.55	3.32	-	3053.19	3.33	-	3150.96	3.29
Depreciation on farm implements	-	325.74	0.32	-	320.04	0.33	-	314.96	0.34	-	320.25	0.33
Cost-A	-	84803.34	84.30	-	79688.18	84.15	-	76924.22	84.07	-	80471.91	84.17
Rental value of land	-	3603.48	3.58	-	3676.64	3.88	-	3580.71	3.91	-	3620.28	3.79
Interest on fixed capital	-	334.13	0.33	-	341.29	0.36	-	334.21	0.36	-	336.54	0.35
Cost-B	-	88740.95	88.21	-	83706.08	88.39	-	80839.15	88.35	-	84428.73	88.32
Family labour (man days)	18.67	2707.15	2.69	17.75	2573.75	2.71	17.33	2512.85	2.74	17.92	2597.92	2.71
Cost-C₁	-	91448.10	90.90	-	86086.76	90.90	-	83176.71	90.90	-	86903.86	90.90
10 % of Cost C ₁	-	9144.81	9.09	-	8608.68	9.09	-	8317.67	9.09	-	8690.39	9.09
Cost-C₂	-	100592.91	100.00	-	94695.43	100.00	-	91494.38	100.00	-	95594.24	100.00
Output Main produce(qtls.)	234.00	845.00	-	244.00	858.00	-	235.00	829.00	-	237.67	844.00	-
Gross income	-	197730.00	-	-	209352.00	-	-	194815.00	-	-	200632.33	-
Net income	-	97137.09	-	-	114656.57	-	-	103320.62	-	-	105038.09	-
Per quintal cost	-	429.88	-	-	388.10	-	-	389.34	-	-	402.21	-

Table 5: Income from potato over different costs of production (n = 126)

Particulars	Small farmers (`/ha.)	Medium farmers (`/ha.)	Large farmers (`/ha.)	Average (`/ha.)
Cost-A	84803.34	79688.18	76924.22	80471.91
Cost-B	88740.95	83706.08	80839.15	84428.73
Cost-C ₁	91448.10	86086.76	83176.71	86903.86
Cost-C ₂	100592.91	94695.43	91494.38	95594.24
Gross income	197730.00	209352.00	194815.00	200632.33
Net Income over				
Cost-A	112926.66	129663.	117890.78	120160.42
Cost-B	108989.05	125645.92	113975.85	116203.60
Cost-C ₁	106281.90	123265.24	111638.29	113728.47
Cost-C ₂	97137.09	114656.57	103320.62	105038.09



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