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Cost structure and profitability of Rabi potato production in Chhatrapati Sambhajnagar district of Maharashtra

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Abstract

Potato (*Solanum tuberosum* L.) is an important food and commercial crop with considerable economic significance. The present study was undertaken to analyse the cost structure and profitability of Rabi potato production in Chhatrapati Sambhajnagar district of Maharashtra. The study was conducted in Kannad, Khultabad and Phulambri talukas using a multistage sampling technique. Three villages from each taluka were selected, and 10 potato growers from each village were randomly selected, giving a total sample of 90 farmers. Primary data were collected through personal interviews using a pre-tested schedule. The cost of cultivation was analysed using standard cost concepts, while profitability was assessed through farm business income, family labour income, net income and input-output ratio. The overall Cost A and Cost C were ₹49,697.71 and ₹81,753.04 per hectare, respectively. Seed constituted the major cost component. Cost C was ₹79,878.82 per hectare on small farms and ₹84,743.62 per hectare on large farms. The overall gross income was ₹1,52,660.00 per hectare, while farm business income, family labour income and net profit were ₹1,02,962.29, ₹74,872.29 and ₹70,906.96 per hectare, respectively. The input-output ratio on Cost C was 1:1.87, indicating profitable potato cultivation. The ratio was highest on medium farms (1:1.89) and lowest on large farms (1:1.84). Thus, Rabi potato cultivation was economically viable on the selected sample farms.

Keywords: Rabi potato, cost of cultivation, profitability, cost structure, input-output ratio, chhatrapati sambhajnagar

Introduction

Potato (*Solanum tuberosum* L.) is one of the most important food and commercial crops in the world and occupies a significant position in global agriculture. Originating in the Andean region of South America, potato has spread widely across different regions because of its adaptability, high yield potential and short crop duration. It is often referred to as the “poor man’s friend” because it is an affordable source of dietary energy and can produce a large quantity of food per unit area within a relatively short period. Thus, potato plays an important role in addressing food and nutritional security, particularly in developing countries (FAO, 2023; Ezekiel *et al.*, 2013) [4, 3].

At the global level, potato is cultivated on approximately 17 million hectares, producing about 383–390 million tonnes annually. The average global productivity is estimated at around 22–23 tonnes per hectare. China contributes approximately 25.5 per cent of global potato production, while India accounts for nearly 15 per cent, highlighting the important position of Asian countries in global potato production. The increasing production of potato is associated with the adoption of improved varieties, better crop management practices, technological advancement and efficient utilization of agricultural resources (FAOSTAT, 2023–24) [4].

In India, potato is the most important tuber crop and is cultivated under diverse agro-climatic conditions. According to the First Advance Estimates of the Department of Agriculture and Farmers Welfare, potato production in India during 2024–25 is projected at 595.72 lakh tonnes. The national average productivity ranges between 23 and 25 tonnes per hectare. Major potato-producing states include Uttar Pradesh, West Bengal, Bihar, Gujarat, Madhya Pradesh, Punjab

and Maharashtra (DA&FW, 2024; Indian Horticulture Database, 2023) [2].

In Maharashtra, potato cultivation is comparatively limited but remains economically important in selected districts. During 2024–25, the area under potato cultivation in the state was estimated at approximately 14.445 thousand hectares. Potato is mainly cultivated in Pune, Ahmednagar, Satara, Nashik, Beed and Chhatrapati Sambhajnagar districts, predominantly during the Rabi season under irrigated conditions. Differences in soil conditions, irrigation availability and crop management practices result in variation in productivity across regions (India stat, 2024).

Chhatrapati Sambhajnagar district is an emerging area for Rabi potato cultivation in the Marathwada region. According to the Final Rabi Report (2024), potato was cultivated on 1,037 hectares in the district, with an estimated production of 24,867 tonnes and average productivity of 17.2 tonnes per hectare. Among the talukas, Khultabad recorded the highest area and production, followed by Phulambri and Kannad. The productivity level of the district remains below the national average, indicating scope for improving production through efficient resource use, adoption of improved varieties, balanced nutrient management, timely irrigation and better crop management practices. (District Agriculture Office, Chhatrapati Sambhajnagar)

Potato cultivation involves substantial expenditure on seed, labour, fertilizers, irrigation and other production inputs, making cost management important for improving farm profitability. Therefore, analysing the cost structure and returns helps assess the economic viability of potato production and identify major components of cultivation cost. Studies in India have also reported that potato cultivation is profitable, with seed and labour forming major components of production cost. (Darade *et al.* 2025) [1].

Objective of the Study

To analyse the cost structure and profitability of potato production in Ch. Sambhajnagar district.

Materials and Methods

The study was conducted in Chhatrapati Sambhajnagar district of Maharashtra, where potato is cultivated mainly during the Rabi season from mid-October to November and harvested in February. A multistage sampling technique was adopted for selection of the study area and respondents. Chhatrapati Sambhajnagar district was selected based on its higher area under potato cultivation, followed by the selection of Kannad, Khultabad and Phulambri talukas. Three villages from each taluka, namely Bahirgaon, Kannad and Chinchkheda; Khirdi, Yesgaon-2 and Ghodegaon; and Phulambri, Dongargaon and Lahanyachiwadi, respectively, were selected. Ten potato growers were randomly selected from each village, resulting in a total sample of 90 farmers. Primary data were collected through personal interviews using a pre-tested schedule.

Results and Discussion

Per Hectare Cost of Cultivation of Rabi Potato on Sample Farms

Table 1 shows that the total operational cost (Cost A) of Rabi potato cultivation is ₹49,697.71 per hectare, while the total cost of cultivation (Cost C) is ₹81,753.04 per hectare. Seed constitutes the highest cost component, followed by human labour, rental value of land, fertilizers, manures and other inputs. For small farms, Cost A is ₹48,824.82 and Cost C is ₹79,878.82 per hectare, while for large farms, Cost A is ₹50,671.62 and Cost C is ₹84,743.62 per hectare. The cost of cultivation is highest on large farms and lowest on small farms. Overall, the higher Cost C than Cost A indicates the inclusion of imputed costs of family labour and owned resources.

Table 1: Per hectare cost of cultivation of Rabi Potato (Rs.)

Sr. No.	Particulars	Size Groups of holding			
		Small	Medium	Large	Overall
1.	Hired human labour	8316.00(10.41)	7650(9.49)	7938.00(9.37)	7968.00(9.75)
2.	Bullock labour	1240.00(1.55)	1720.00(2.13)	1880.00(2.22)	1613.33(1.97)
3.	Machine labour	1620.00(2.03)	1800.00(2.23)	1860.00(2.20)	1760.00(2.15)
4.	Tubers	13040.00(16.32)	13600(16.86)	14000(16.52)	13546.67(16.57)
5.	Manures	1980.00(2.48)	2080.00(2.58)	2130.00(2.51)	2063.33(2.52)
6.	Fertilizers	10640.72(13.32)	11049.26(13.70)	11474.30(13.54)	11054.76(13.52)
7.	Irrigation charges	5400(6.76)	4750.00(5.89)	4100.00(4.84)	4750.00(5.81)
8.	Plant protection	1675.00(2.10)	1750.00(2.17)	2060.00(2.43)	1828.33(2.24)
9.	Repairs and incidental charges	525.00(0.66)	515.00(0.64)	535.00(0.63)	525.00(0.64)
10.	Working capital (Σ 1 to 9)	44436.72(55.63)	44914.26(55.70)	45977.30(54.26)	45109.43(55.18)
11.	Interest on working capital @ 6% per annum.	1333.10(1.67)	1347.43(1.67)	1379.32(1.63)	1353.28(1.66)
12.	Depreciation	2860.00(3.58)	3120.00(3.61)	3080.00(3.63)	3020.00(3.69)
13.	Land revenue and other cases	195.00(0.24)	215.00(0.27)	235.00(0.28)	215.00(0.26)
14.	Cost A (Σ 1 to 12)	48824.82(61.12)	49596.96(61.50)	50671.62(59.79)	49697.71(60.79)
15.	Rental value of land	23200.00(29.04)	23600.00(29.27)	26200(30.92)	24333.33(29.76)
16.	Interest on fixed capital @ 10%	3750.00(4.69)	3500.00(4.34)	4020.00(4.74)	3756.67(4.60)
17.	Cost B (Σ 13 to 14)	75774.82(94.86)	76696.69(95.11)	80891.62(95.46)	77787.71(95.15)
18.	Family human labour	4104.00(5.14)	3942.00(4.89)	3852.00(4.55)	3966.00(4.85)
19.	Cost C (Σ 16 to 17)	79878.82(100)	80638.69(100)	84743.62(100)	81753.04(100)
20.	Production (q)	176.50	179.20	183.10	179.06
21.	Gross Return (Rs.)	150.25	152320	155635	152660

(Figures in parentheses indicate the percentages to the respective total cost)

Per Hectare Costs and Returns from Rabi Potato on Sample Farms

Table 2 shows that the overall Cost A, Cost B and Cost C of Rabi potato cultivation are ₹49,697.71, ₹77,787.71 and

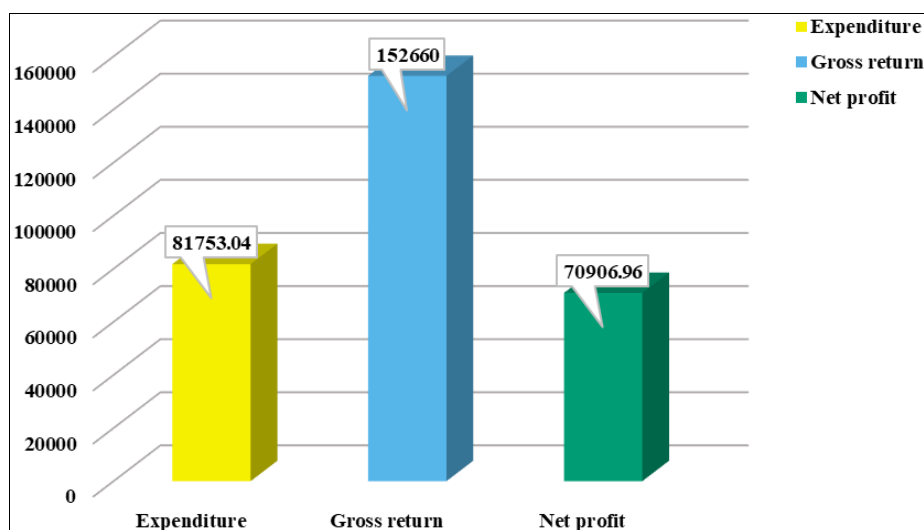
₹81,753.04 per hectare, respectively. The gross income is ₹1,52,660.00, while the farm business income, family labour income and net profit are ₹1,02,962.29, ₹74,872.29 and ₹70,906.96 per hectare, respectively. The input-output ratio is

1:1.87, indicating profitable cultivation. For small farms, Cost A, Cost B and Cost C are ₹48,824.82, ₹75,774.82 and ₹79,878.82, with a net profit of ₹70,146.18 and an input-output ratio of 1:1.88. For medium farms, the corresponding costs are ₹49,596.69, ₹76,696.69 and ₹80,638.69, with a net profit of ₹71,681.31 and an input-output ratio of 1:1.89. For large farms,

Cost A, Cost B and Cost C are ₹50,671.62, ₹80,891.62 and ₹84,743.62, with a net profit of ₹17,891.38 and an input-output ratio of 1:1.84. The input-output ratio is highest on medium farms and lowest on large farms. Overall, Rabi potato cultivation is profitable across all farm-size groups.

Table 2: Per hectare Costs, Returns and Net Profitability of Rabi Potato (Rs.)

Sr. No.	Particulars	Size Groups of holding			
		Small	Medium	Large	Overall
1	Production (q)	176.50	179.20	183.10	179.60
2	Gross income	150025.00	152320.00	155635.00	152660.00
3	Total cost				
	Cost A	48824.82	49596.69	50671.62	49697.71
	Cost B	75774.82	76696.69	80891.62	77787.71
	Cost C	79878.82	80638.69	84743.62	81753.04
4	Income				
	Farm Business Income	101200.18	102723.31	104963.38	102962.29
	Family labour Income	74250.18	75623.31	74743.38	74872.29
	Net Income	70146.18	71681.31	70891.38	70906.96
5	Cost of cultivation/kg	4.53	4.50	4.63	4.55
6	Average price Per kg received	8.50	8.50	8.50	8.50
7	B:C ratio	1.88	1.89	1.84	1.87



Percentage of expenditure in potato production on overall farm to Cost-C (Rs 81753.04)

Conclusion

The cost analysis indicates that seed is the major cost component in Rabi potato cultivation. The total cost of cultivation (Cost C) is ₹81,753.04 per hectare at the overall level, with the highest cost on large farms (₹84,743.62) and the lowest on small farms (₹79,878.82). Potato cultivation is profitable across all farm-size groups, as reflected by positive net returns and input-output ratios above unity. The overall net profit is ₹70,906.96 per hectare with an input-output ratio of 1:1.87, while the highest input-output ratio is observed on medium farms (1:1.89). Thus, Rabi potato cultivation is economically viable on the selected sample farms.

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