



Study on Economic Analysis of Cost and Return of Rabi Maize (*Zea mays* L) in Rajasthan, India

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Authors' contributions

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

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ABSTRACT

The present study was conducted to analyze the cost and return of rabi maize in Banswara district of Rajasthan. The study area was selected on the basis of highest gross cropped area of rabi maize in study area. A sample of 120 farmers were selected randomly in the study area during the year 2020-21. Farmers were categorized into two categories i.e., beneficiary (canal irrigation) and non-beneficiary (other than canal irrigation) farms. The standard cost concept method of the CACP was used to calculate cost of cultivation of maize crop. Results revealed that overall cost of cultivation was found ₹37573.98 and ₹37857.86 on beneficiary and non-beneficiary farms,

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respectively. Overall net return was found more on beneficiary compared to non- beneficiary farms. Return per rupee was found more on beneficiary farms compare to non- beneficiary farms i.e., 2.15 and 1.92, respectively.

Keywords: Rabi maize; canal irrigation; cost; return.

1. INTRODUCTION

Maize (*Zea mays* L) is cultivated globally being one of the most important cereal crops worldwide. Maize is second rated grain that is used collectively in form of foodstuff or fodder. Globally, maize is known as “Queen of cereals” because it has highest genetic yield potential among the cereals. It is widely used as food, feed and fodder besides use as industrial raw material and also for bio-ethanol production. In India, maize is principally grown in two seasons, rainy (kharif) and winter (rabi). Kharif maize represents in 83 per cent of maize area in India, while rabi maize correspond to 17 per cent maize area. Over 70 per cent of kharif maize area is grown under the rainfed condition with a prevalence of many biotic and abiotic stresses. The stress prone ecology contributes towards lower productivity of kharif maize (2.7 quintal/ ha) as compared to rabi maize (4.4 quintal/ ha), which is predominately grown under assured ecosystem. Rabi maize has been sown in around 19.31 lakh hectares (47.72 lakh acres) as on February 2022 which is higher than 17.51 lakh hectares (43.27 lakh acres) covered during corresponding period of last year. Major maize growing states are Bihar 5.96 lakh ha, Maharashtra 3.37 lakh ha, Telangana 1.92 lakh ha and Tamil Nadu 1.91 lakh ha [1-4].

Agriculture forms the backbone of the Indian economy, providing sustenance and livelihood to a significant portion of the population. In the arid and semi-arid regions of Rajasthan, Rabi maize cultivation has emerged as a prominent agricultural practice, particularly in the Banswara district [5,6]. The economic viability of agricultural practices plays a pivotal role in determining the prosperity of farmers and the overall agricultural sector. Economic analysis of crop cultivation helps in understanding the costs incurred by farmers during production and evaluating the subsequent returns obtained from the sale of their produce. Such analyses are essential in formulating effective agricultural policies, improving farming practices, and enhancing farmers' incomes. Banswara district, located in Southern Rajasthan, is characterized by its unique agro-climatic conditions, making it

suitable for Rabi crop cultivation, particularly maize. Maize cultivation during the Rabi season not only provides an alternative cropping option but also enhances farmers' income and employment opportunities Swain et al. [7].

2. MATERIALS AND METHODS

The present study has been carried out in Banswara district of Rajasthan during the agriculture year 2020-21. Three tehsils in Banswara district ghatol, banswara and garhiwere chosen for the study based on the highest area of rabi maize under canal irrigation source. The selected farmers were categorised into three categories i.e., small, medium and large on the basis of cumulative frequency distribution method of their land holdings. A sample of 120 farmers was selected randomly in the study area. Selection of farmers categorized into two categories i.e., beneficiary and non-beneficiary farmers to compare the importance of irrigation by selected irrigation source and other irrigation sources.

2.1 Cost Concepts

The cost of cultivation was calculated by using simple tabular analysis and standard method used by CACP to work out the cost of cultivation of rabi maize was adopted. This included Cost A1, Cost A2, Cost B1 Cost B2, Cost C1 Cost C2 and Cost C3. Details are under:

Cost A1: It includes value of hired human labour (permanent and casual), value of hired or owned bullock labour, value of owned and hired machinery labour, value of seed (farm produced and purchased), value of plant protection measures, value of manure (owned and purchased), value of fertilizers, depreciation on implements and farm buildings, irrigation charges, land revenue, cesses and other taxes, interest on working capital, miscellaneous charges etc.

Cost A2: Cost A1 + rental value for leased-in-land

Cost B1: Cost A1 + interest value of owned fixed capital assets (excluding land)

Cost B2: Cost B1 + rental value of owned land (net of land revenue) and rent paid for leased-in-land

Cost C1: Cost B1 + imputed value of family labour

Cost C2: Cost B2 + imputed value of family labour

Cost C3: Cost C2 + 10 per cent of Cost C2 to account managerial input of the farmer

2.2 Income Measures

1. Gross income/ return is the value of main product and by product.

$$\text{Gross income} = Q_{mp} \times P_{mp} + Q_{bp} \times P_{bp}$$

Where,

Q_{mp} = Quantity of crop main product

P_{mp} = Price of crop main product

Q_{bp} = Quantity of crop by product

P_{bp} = Price of crop by product

2. Farm business income = Gross income – Cost A1
3. Family labour income = Gross income – Cost B2
4. Farm investment income = Farm Business income – Imputed value of family labour
5. Net income = Gross income – Cost C2

3. RESULTS AND DISCUSSION

Rabi maize crop is cultivated in an area of about 40000 hectares in Banswara district (KVK Banswara, Report). Due to favourable climatic condition, there is ample scope to realize protentional productivity in rabi maize. It requires irrigation during different stage of crop growth. Seedling, knee height stage, flowering and grain feeling are the most sensitive stage for irrigation. Water stress at these stages cause huge loss in yield. Thus, the two situations of irrigation water supply were studied i.e., the farmers who have assured canal irrigation (beneficiaries) and those who have other source of irrigation (non-beneficiaries) on their farms to estimate and compare the cost of cultivation and income measures on beneficiary and non-beneficiary farms.

3.1 Cost of Cultivation of Rabi Maize on Beneficiary Farms in Banswara District

Cost of cultivation of rabi maize crop on beneficiary farms under canal irrigation source in

Banswara district was worked out is given in Table 1. Results indicated that, per hectare cost of cultivation of rabi maize was highest on large farms i.e., ₹ 38619.19 followed by medium farms ₹ 37747.42 and small farms ₹ 36355.33 respectively. Overall cost of maize cultivation was observed to ₹ 37573.98 on sampled farms. When it expressed in percentage term, 80.97 per cent cost incurred on variable cost items and 19.03 per cent on fixed cost items out of total cost. Human labour (16.76 per cent) shared highest percentage share among the various items of the total cost. Cost of fertilizer (16.07 per cent) and machine labour (14.93 per cent) stood at second and third position in the total cost. The cost incurred on fertilizers was found to be higher on large farms i.e., ₹ 6370.63 per hectare compared to other sampled farms. Similarly, cost incurred on machine labour was found to be highest on large farms ₹ 5905.58 followed by medium farms ₹ 5626.29 and small farms ₹ 5308.15 per hectare. The contribution of cost incurred on imputed value of family labour to total cost of cultivation was highest for small size of farms (₹ 5145.60), followed by medium farms (₹ 4415.09) and large size farms (₹ 3636.71). Thus, the cost of family labour decreases with increase in size of land holding on per hectare basis.

The cost incurred on seed found to be ₹ 3812.40, ₹ 3992.15 and ₹ 4050.74 for small, medium and large farms, respectively. On large farms, farmers used hybrid and high yielding variety seed. Interest on working capital found more on large farms (₹ 2485.60) compared to medium (₹ 2381.25) and small farms (₹ 2229.73) respectively. Irrigation cost was found to be zero on beneficiary farms because free cost of canal irrigation water supply by Rajasthan government in Banswara district. Similar results have been obtained by Choudhari et al. [8]. Thus, the cost of cultivation increased with increase in size of farms mainly due to more use of fertilizer, machine labour, plant protection and seed cost on large farms compared to other farms.

3.2 Analysis of Cost of Rabi Maize Cultivation Based on Cost Concepts

The analysis of cost items in rabi maize were grouped under Cost A1 to Cost C3 and are given in Table 2 for beneficiary farms in Banswara district. The overall Cost A1/A2 were found to be ₹ 26828.84 as there was no leased in tendency on selected sample farms in study area. Cost B1 and Cost B2 on overall basis were worked out to

be ₹ 27479.21 and ₹ 33174.85 per hectare respectively. Cost C1, Cost C2 and Cost C3 were worked out to be ₹ 31878.35, ₹ 37573.98 and ₹ 41331.38 per hectare, respectively.

Further, there was an increasing trend in all the cost concepts as the size of farms increases. These results are in lined to the findings of Navadkar et al. [9].

Table 1. Cost of cultivation of rabi maize on beneficiary farms in Banswara district (₹ / ha)

S. No.	Cost items	Farm size groups			Overall
		Small	Medium	Large	
1	Total human labour	6516.00 (17.92)	6325.95 (16.76)	6026.61 (15.61)	6289.52 (16.76)
(a)	Family labour	5145.60 (14.15)	4415.09 (11.70)	3636.71 (9.42)	4399.13 (11.76)
(b)	Hired human labour	1370.40 (3.77)	1910.86 (5.06)	2389.90 (6.19)	1890.39 (5.01)
2	Animal labour	664.47 (1.83)	525.30 (1.39)	312.00 (0.81)	500.59 (1.34)
3	Machine labour	5308.15 (14.60)	5626.29 (14.91)	5905.58 (15.29)	5613.34 (14.93)
4	Seed	3812.40 (10.49)	3992.15 (10.58)	4050.74 (10.49)	3951.76 (10.52)
5	Manure (FYM)	1734.23 (4.77)	1365.08 (3.62)	1141.75 (2.96)	1413.69 (3.78)
6	Fertilizer	5760.00 (15.84)	5991.45 (15.87)	6370.63 (16.50)	6040.69 (16.07)
7	Plant protection	3647.60 (10.03)	4401.33 (11.66)	4685.35 (12.13)	4244.76 (11.28)
8	Irrigation	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
9	Interest on working capital	2229.73 (6.13)	2381.25 (6.31)	2485.60 (6.44)	2365.52 (6.29)
A.	Total Variable cost	29672.58 (81.62)	30608.80 (81.09)	30978.26 (80.21)	30419.88 (80.97)
10	Rental Value of land	5370.50 (14.77)	5726.30 (15.17)	5990.10 (15.51)	5695.63 (15.15)
11	Depreciation on farm implements	704.73 (1.94)	763.36 (2.02)	956.20 (2.48)	808.10 (2.15)
12	Interest on fixed capital	607.52 (1.67)	648.97 (1.72)	694.63 (1.80)	650.37 (1.73)
B.	Total Fixed cost	6682.75 (18.38)	7138.63 (18.91)	7640.93 (19.79)	7154.10 (19.03)
Total Cost (A+B)		36355.33 (100.00)	37747.42 (100.00)	38619.19 (100.00)	37573.98 (100.00)

Figures in parentheses are percentages of column totals (total cost)

Table 2. Cost of cultivation of rabi maize based on cost concepts on beneficiary farms in Banswara district (₹ / ha)

Items	Small	Medium	Large	Overall
Cost A1/A2	25231.71	26957.07	28297.75	26828.84
Cost B1	25839.23	27606.03	28992.38	27479.21
Cost B2	31209.73	33332.33	34982.48	33174.85
Cost C1	30984.83	32021.12	32629.09	31878.35
Cost C2	36355.33	37747.42	38619.19	37573.98
Cost C3	39990.86	41522.16	42481.10	41331.38

3.3 Economics of Rabi Maize Cultivation

Comparison of cost, income and return per rupee of rabi maize cultivation on beneficiary farms in Banswara district are shown in Table 3. Results revealed that on an average, productivity of rabi maize crop was 58.38 qt/ha. The overall cost of production per quintal of rabi maize was ₹ 644.11. Overall Net return over cost C2 from rabi maize cultivation of the sample farms worked out to be ₹ 43310.52 per hectare. It was lowest (₹ 40183.67) on small farms and highest (₹ 45976.32) on large farms. Similar results were also observed by Rout et al. [10] in groundnut crop. Farm business income was worked out highest on large farms i.e., ₹ 56297.76 which was more than overall ₹ 54055.66 per hectare. On an overall basis, family labour income and farm investment income were found to be ₹ 47709.66 and ₹ 49656.53 respectively, per hectare. The overall return per rupee was 2.15.

3.4 Cost of Cultivation of Rabi Maize on Non-Beneficiary Farms in Banswara District

Cost of cultivation of rabi maize crop was worked out for non-beneficiary farms, the total cost of cultivation of maize crop for overall farms was Rs. 37857.86 which constituted Rs. 32096.88 of total variable cost and Rs. 5760.99 total fixed cost on selected non-beneficiary farms. The component wise break up of cost of cultivation indicated that variable cost and fixed costs accounted for 84.78 per cent and 15.22 per cent of the total cost, respectively. Fertilizer was observed to be the most important variable cost, accounting for nearly 15.17 per cent of the total cost of rabi maize cultivation. Cost incurred on

total human labour was stood at second position with 14.88 per cent.

The total cost of cultivation of rabi maize crop on per hectare basis was ₹ 38652.73, ₹ 37860.57 and ₹ 37060.29 on large, medium and small size farms, respectively. The cost of fertilizer was observed to be highest on large farms i.e., ₹ 6157.33 (15.93 per cent) followed by medium farms ₹ 5766.21 (15.23 per cent) and small farms ₹ 5313.40 (14.34 per cent). This may be due fact that to small size farms used less quantity of fertilizers due to their poor financial condition. The cost of total human labour was found to be highest on large farms i.e. ₹ 6007.42 which was more than overall cost ₹ 5628.69 per hectare. The overall cost of machine labour on sample farms was ₹ 5273.73 per hectare. The total cost of machine labour on small size farms was the lowest i.e., ₹ 5150.25 due to more involvement of family labour for rabi maize cultivation activities in comparison to other farms and it was more on large farms (₹ 5375.47) than overall cost. The per hectare irrigation charges on sample farms were of ₹ 2098.58. In the case of large size of farms, the irrigation charges were highest (₹2539.06) and lowest on small farms ₹ 1586.46 per hectare. On sample farms, the total cost of manure (Farm Yard Manure) was ₹ 1774.13 per hectare.

Depreciation cost on farm implements and interest on fixed capital increased with the increase in size of land holding. The increasing trend of depreciation indicated that large farmers have a greater number of farm assets. This was due to the fact that large farmers were economically sound. Gautam et al. [11] also observed similar findings of rental value of owned land as major part of fixed cost in sorghum cultivation.

Table 3. Cost and return from rabi maize production on beneficiary farms in Banswara district (₹ / ha)

Yield and Income	Small	Medium	Large	Overall
Cost of Cultivation	36355.33	37747.42	38619.19	37573.98
Main product (Quintal. /ha)	55.18	58.87	61.08	58.38
Value of main product	66216.00	70644.00	73296.00	70052.00
By product (Quintal. /ha)	68.82	72.50	75.33	72.22
Value of by product	10323.00	10875.00	11299.50	10832.50
Cost of production (₹ / quintal)	658.85	641.20	632.27	644.11
Gross return	76539.00	81519.00	84595.50	80884.50
Net return over cost C2	40183.67	43771.58	45976.32	43310.52
Farm business Income	51307.30	54561.93	56297.76	54055.66
Family labour Income	45329.27	48186.67	49613.03	47709.66
Farm investment Income	46161.70	50146.84	52661.05	49656.53
Return per rupee	2.11	2.16	2.19	2.15

Table 4. Cost of cultivation of rabi maize on non- beneficiary farms in Banswara district (₹ / ha)

S. No.	Cost items	Farm size groups			Overall
		Small	Medium	Large	
1	Total human labour	6007.42 (16.21)	5492.97 (14.51)	5385.69 (13.93)	5628.69 (14.88)
(a)	Family labour	5030.12 (13.57)	4385.33 (11.58)	3901.46 (10.09)	4438.97 (11.75)
(b)	Hired human labour	977.30 (2.64)	1107.64 (2.93)	1484.23 (3.84)	1189.72 (3.13)
2	Animal labour	890.70 (2.40)	618.25 (1.63)	551.80 (1.43)	686.92 (1.82)
3	Machine labour	5150.25 (13.90)	5295.46 (13.99)	5375.47 (13.91)	5273.73 (13.93)
4	Seed	4080.43 (11.01)	4098.55 (10.83)	4194.63 (10.85)	4124.54 (10.90)
5	Manure (FYM)	2067.20 (5.58)	1806.30 (4.77)	1448.90 (3.75)	1774.13 (4.70)
6	Fertilizer	5313.40 (14.34)	5766.21 (15.23)	6157.33 (15.93)	5745.65 (15.17)
7	Plant protection	3861.50 (10.42)	4310.88 (11.39)	4578.49 (11.85)	4250.29 (11.22)
8	Irrigation	1586.46 (4.28)	2170.21 (5.73)	2539.06 (6.57)	2098.58 (5.53)
9	Interest on working capital	2392.72 (6.46)	2517.35 (6.65)	2632.99 (6.81)	2514.36 (6.64)
A.	Total Variable cost	31350.08 (84.59)	32076.18 (84.72)	32864.36 (85.02)	32096.88 (84.78)
10	Rental Value of land	4600.50 (12.41)	4425.00 (11.69)	4364.25 (11.29)	4463.25 (11.80)
11	Depreciation on farm implements	590.60 (1.59)	833.54 (2.20)	897.90 (2.32)	774.01 (2.04)
12	Interest on fixed capital	519.11 (1.40)	525.85 (1.39)	526.22 (1.36)	523.73 (1.38)
B.	Total Fixed cost	5710.21 (15.41)	5784.39 (15.28)	5788.37 (14.98)	5760.99 (15.22)
Total Cost (A+B)		37060.29 (100.00)	37860.57 (100.00)	38652.73 (100.00)	37857.86 (100.00)

Figures in parentheses are percentages of column totals (total cost)

3.5 Analysis of Cost of Rabi Maize Cultivation Based on Cost Concepts

The cost items for rabi maize cultivation were grouped under cost A1 to cost C3 which are given in Table 5. The overall cost A1 (same as A2) was found to be as ₹ 28431.92 because no land was taken on lease in study area. The Cost B1, Cost B2, Cost C1 and Cost C2 were calculated ₹ 28955.64, ₹ 33418.89, ₹ 33394.61 and ₹ 37857.86 per hectare respectively, on the overall basis. Cost C3 which takes into accounts the managerial function performed by framers, was ₹ 41643.65 per hectare. All costs were comparatively higher for large farms compared to other sampled farms. Because of the fact that

farm mechanisation equipment's were mainly used by large farmers was used. All the cost concepts showed increasing trend with the increase in size of farms.

3.6 Cost and Return from Rabi Maize Production on Non-Beneficiary Farms

The table 6 revealed that on an average per hectare overall productivity of rabi maize was 52.11 qt/ha. The overall cost of rabi maize production was found to be almost similar on all farms. Overall net return over cost C2 of the sample farms worked out to be ₹ 34798.64 per hectare. It was lowest (₹ 33087.21) on small farms and highest (₹ 36327.77) on large farms.

Overall farm business income, family labour income and farm investment income were worked out highest on large farms i.e., ₹ 44224.58, ₹ 39237.61 and ₹ 39785.61 per hectare, respectively. The overall return per rupee investment was calculated as 1.92.

3.7 Comparison of Rabi Maize Cultivation on Beneficiary and Non-Beneficiary Farms

The level of input use and cost of different items were worked out to compare the cost of cultivation of rabi maize on beneficiary and non-beneficiary farms are depicted in Table 7. The total cost of cultivation of rabi maize crop on beneficiary and non-beneficiary farms was ₹ 37573.98 and ₹ 37857.86 per hectare, respectively showing decrease of -0.75 per cent cost on beneficiary farms over non-beneficiary farms. The major difference on input cost of maize on beneficiary and non-beneficiary farms observed on irrigation less as ₹ 2098.58 per hectare. It was due to the fact that zero cost canal irrigation water supply on beneficiary farms on per the policy of state government. Rental value of land ranked second costlier operation on beneficiary farms over non-beneficiary farms as the difference in cost was 27.61 per cent. Other

costlier items of rabi maize cultivation per hectare on beneficiary farms were hired human labour i.e., ₹ 700.66, fertilizer i.e., ₹ 295.05, and machine labour i.e., ₹ 339.61, over non-beneficiary farms. The cost of cultivation of rabi maize on non-beneficiary farms observed higher than beneficiary farms because of its higher expenditure towards irrigation, manure, seed and animal labour.

3.8 Cost Concepts of Rabi Maize Cultivation on Beneficiary and Non-Beneficiary Farms

The per hectare Cost A1/ A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3 of maize on beneficiary farms were found less than the non-beneficiary farms respectively on the sample farms as shown in Table 8. Thus, may be due high cost incurred on irrigation manure, seed, hired human labour and animal labour.

3.9 Comparison of Cost and Return of Rabi Maize on Beneficiary and Non-Beneficiary Farms

The Table 9 revealed that, gross return, Net return over cost C2, farm business income, family labour income and farm investment

Table 5. Cost of cultivation of rabi maize based on cost concepts on non-beneficiary farms in Banswara district (₹ / ha)

Items	Small	Medium	Large	Overall
Cost A1/A2	26910.56	28524.39	29860.80	28431.92
Cost B1	27429.67	29050.24	30387.02	28955.64
Cost B2	32030.17	33475.24	34751.27	33418.89
Cost C1	32459.79	33435.57	34288.48	33394.61
Cost C2	37060.29	37860.57	38652.73	37857.86
Cost C3	40766.32	41646.63	42518.00	41643.65

Table 6. Cost and return from rabi maize production on non-beneficiary farms in Banswara district (₹ / ha)

Yield and Income	Small	Medium	Large	Overall
Cost of cultivation	37060.29	37860.57	38652.73	37857.86
Main product (Quintal. /ha)	50.65	52.16	53.52	52.11
Value of main product	60780.00	62592.00	64224.00	62532.00
By product (Quintal. /ha)	62.45	68.33	71.71	67.50
Value of by product	9367.50	10249.50	10756.50	10124.50
Cost of production (₹ / quintal)	731.69	725.85	722.21	726.59
Gross return	70147.50	72841.50	74980.50	72656.50
Net return over cost C2	33087.21	34980.93	36327.77	34798.64
Farm business Income	43236.94	44317.11	45119.70	44224.58
Family labour Income	38117.33	39366.26	40229.23	39237.61
Farm investment Income	38206.82	39931.78	41218.24	39785.61
Return per rupee	1.89	1.92	1.94	1.92

Table 7. Input wise comparative cost of rabi maize cultivation on beneficiary and non-beneficiary farms in Banswara district (₹ / ha)

S. No.	Particulars	Beneficiary farms	Non-beneficiary farms	Differences	Percentage increases or decreases over non- beneficiary farms
1	2	3	4	5=3-4	6=5/4
1	Total human labour	6289.52	5628.69	660.83	11.74
(a)	Family labour	4399.13	4438.97	-39.84	-0.90
(b)	Hired human labour	1890.39	1189.72	700.66	58.89
2	Animal labour	500.59	686.92	-186.33	-27.13
3	Machine labour	5613.34	5273.73	339.61	6.44
4	Seed	3951.76	4124.54	-172.77	-4.19
5	Manure (FYM)	1413.69	1774.13	-360.45	-20.32
6	Fertilizer	6040.69	5745.65	295.05	5.14
7	Plant protection	4244.76	4250.29	-5.53	-0.13
8	Irrigation	0.00	2098.58	-2098.58	-100.00
9	Interest on working capital	2365.52	2514.36	-148.83	-5.92
A.	Total Variable Cost	30419.88	32096.88	-1677.00	-5.22
10	Rental Value of land	5695.63	4463.25	1232.38	27.61
11	Depreciation on farm implements	808.10	774.01	34.08	4.40
12	Interest on fixed capital	650.37	523.73	126.65	24.18
B.	Total Fixed Cost	581.32	534.75	46.57	8.71
Total Cost (A+B)		37573.98	37857.86	-283.89	-0.75

Table 8. Comparison of total cost of rabi maize on beneficiary and non-beneficiary farms in Banswara district (₹ / ha)

S. No.	Particulars	Beneficiary farms	Non-beneficiary farms	Differences	Percentage increases or decreases over non- beneficiary farms
1	2	3	4	5=3-4	6=5/4
1	Cost A1/A2	26828.84	28431.92	-1603.08	-5.64
2	Cost B1	27479.21	28955.64	-1476.43	-5.10
3	Cost B2	33174.85	33418.89	-244.05	-0.73
4	Cost C1	31878.35	33394.61	-1516.27	-4.54
5	Cost C2	37573.98	37857.86	-283.89	-0.75
6	Cost C3	41331.38	41643.65	-312.27	-0.75

Table 9. Comparison of cost and return of rabi maize on beneficiary and non-beneficiary farms in Banswara district (₹ / ha)

S. No.	Particulars	Beneficiary farms	Non-beneficiary farms	Differences	Percentage increases or decreases over non-beneficiary
1	2	3	4	5=3-4	6=5/4
1	Cost of cultivation	37573.98	37857.86	-283.89	-0.75
2	Main product (Quintal. /ha)	58.38	52.11	6.27	12.03
3	Value of main product	70052.00	62532.00	7520.00	12.03
4	By product (Quintal. /ha)	72.22	67.50	4.72	6.99
5	Value of by product	10832.50	10124.50	708.00	6.99
6	Cost of production (₹ / quintal)	644.11	726.59	-82.48	-11.35
7	Gross return	80884.50	72656.50	8228.00	11.32
8	Net return over cost C2	43310.52	34798.64	8511.89	24.46
9	Farm business Income	54055.66	44224.58	9831.08	22.23
10	Family labour Income	47709.66	39237.61	8472.05	21.59
11	Farm investment Income	49656.53	39785.61	9870.92	24.81
12	Return per rupee	2.15	1.92	0.23	-

income per hectare of rabi maize on beneficiary farms found be ₹ 8228.00 (11.32 per cent), ₹ 8511.89 (24.46 per cent), ₹ 9831.08 (22.23 per cent), ₹ 8472.05 (21.59 per cent) and ₹ 9870.92 (24.81 per cent) which were higher than non-beneficiary farms, respectively on the sample farms. On an average, return per rupee investment of rabi maize on beneficiary farms came to be ₹ 2.15 which was higher than non-beneficiary farms i.e., 1.92. Cost of production was found to less by ₹ 82.48 (-11.35 per cent on beneficiary farms compared to non-beneficiary farms because of efficient and timely use of assured irrigation along with required inputs.

4. CONCLUSION

From the above discussion it can be concluded that the cultivation of maize was more profitable for beneficiary farms as compared to non-beneficiary farm in study area. Which might be timely irrigation facilities and lifesaving irrigation facilities were available on beneficiary farms. Overall cost of cultivation was found ₹37573.98 and ₹37857.86 on beneficiary and non-beneficiary farms, respectively. Overall net return was found more on beneficiary compared to non-beneficiary farms. Return per rupee was found more on beneficiary farms compare to non-beneficiary farms i.e., 2.15 and 1.92, respectively. It is recommended that rabi maize crop should be preferred over other crops in Banswara district to realize better returns from the available resources.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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