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Economic analysis of costs and returns structure of Kala Namak rice cultivation in Eastern Uttar Pradesh

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Abstract

The present study entitled “Economic analysis of Costs and Returns structure of Kala Namak Rice Cultivation in Eastern Uttar Pradesh” was performed in the Gorakhpur, Kushinagar, Deoria and Maharajganj districts in Uttar Pradesh through proportionate cum random sampling on 120 respondents. In the study area revealed that the total cost of cultivation of Kala Namak rice was observed to be Rs.65138.19. The costs of cultivation were highest on medium farms Rs.68664.21, followed by small farms Rs.68230.09 and marginal farms Rs.63052.36, respectively. Whereas on overall average, net income and cost of production were found Rs. 115117.90 per hectare and Rs. 1989.01 per quintal whereas input-output ratio related to cost A1/A2 was highest on marginal farms (1:4.30) in the study area.

Keywords: Kala Namak rice, production, cost concept, benefit cost ratio, farm income measures

Introduction

India is the second-largest rice producer and the largest exporter of rice in the world. Rice Production in India expanded from 53.6 million tons in the financial year 1980 to 120 million tons in the financial year 2020-21. Rice is one of the main grains of India. Rice is one of the chief grains of India. Moreover, India is the largest area under rice cultivation. As it is one of the principal food crops. It is, in fact, the dominant crop of the country. India is one of the leading producers of this crop. Uttar Pradesh is the second-largest rice-producing state in India, with an annual production of around 15.27 million metric tons. It accounts for 12.81 percent of the country's total rice production. The state produces a wide variety of rice, including Basmati, which is highly prized for its fragrance and flavour. It has been among the largest rice-producing states for a long time now. The districts of Bijnaur, Kushinagar, and Pilibheet are the top rice-producing districts in Uttar Pradesh.

Firstly, it should be clear what is Kala Namak Rice. The majority of people are confused with the name Kala Namak Rice (Black salt or Black rice or Basmati rice), but Kala Namak Rice is an aromatic/scented variety of rice having black husk and white rice (after polished milling). Eastern Uttar Pradesh's Kala Namak is a historical variety of rice that is prized for its flavour, fragrance, and nutritional content. Due to varietal loss and HYV competition, its cultivation decreased from 50,000 hectares to fewer than 2,000 ha. The KN3, Bauna Kala Namak 101, Bauna Kala Namak 102, and Kala Namak Kiran enhanced varieties were recently introduced in 2010, 2016, 2017, and 2018 accordingly. According to the current study, Bauna Kala Namak has a very high net profit compared to conventional HYV rice in the case of Kala Namak KN3, and its net profit per hectare is three times greater than HYV rice in the case of organic Bauna Kala Namak. KN3, Bauna Kala Namak 101, Bauna Kala Namak 102, and Kala Namak Kiran are improved cultivars of the Kala Namak rice. A set of procedures for growing regular and organic Kala Namak rice, as well as for certifying it, has been created. Hundreds of farmers have connections with the local and international markets on favourable conditions for long-term sales. In comparison to per ha net profit from conventional HYV rice, Bauna Kala Namak Kiran would yield net profits thrice the conventional per hectare. Beginning in Kharif 2021 and further forward, farmers and marketing firms will be included in the arranged contract growing. Farmers' net profits will triple, with sustainability guaranteed.

Overall, cost of cultivation of Mahamaya rice variety was accounted Rs. /ha 37090.31. The gross return of Rs./ha 87432.40 was obtained from Mahamaya rice variety. Input output ratio was found to be 1:2.36. (Churpal *et al.*, 2015) [3]. The gross margin (NRs. 53,531/ha) and benefit cost ratio (2.05) indicated that rice production was profitable with the productivity of 4.5 mt/ha. The return to scale of rice production was calculated 0.86 which indicated that the production function exhibited a decreasing return to scale. (Subedi *et al.*, 2020) [6]. The per cost of cultivation was varied among the size groups of paddy highest in marginal (Rs. 57277.5/ha) and lowest in medium (Rs.54659/ha) and small (Rs.55703.4/ha). The input output ratio is highest on medium size farms and lowest on marginal size farms (Chaithanya and Maurya, 2020) [5].

Materials and Methods

The district Gorakhpur, Kushinagar, Deoria and Mahrajganj was selected for the study. A separate list of Kala Namak rice growers in Uttar Pradesh was prepared based on their size of holding and stratified into three categories *i.e.* Marginal, Small and Medium. From this list, a sample of 120 respondents was drawn following the proportionate random selection for different categories. The primary data were collected by survey method through personal interviews with the use of a pre-structured and pre-tested schedule. The data pertained to agriculture year 2022-2023. Tabular analysis was made to compare different aspects of the analysis of costs and returns on different categories of the sample farms.

Measures of cost concepts

Cost A1: This cost includes actual expenditure incurred in cash and kind.

1. Value of hired human labour.
2. Value of hired bullock labour.
3. Value of owned bullock labour.
4. Value of owned machinery labour.
5. Hired machinery charges.
6. Value of seed (both farm-produced and purchased).
7. Value of fertilizer.
8. Value of insecticides and pesticides.
9. Value of manure (owned and purchased)
10. Depreciation on implements and farm buildings.
11. Irrigation charges.
12. Land revenue cesses and other taxes.
13. Interest in working capital.
14. Miscellaneous expenses (artisans etc.).

Cost A2: Cost A1 + rent paid for leased land.

Cost B1: Cost A2 + interest on value of owned fixed capital assets (including land).

Cost B2: Cost B1 + rental value of owned land

Cost C1: Cost B1 + imputed value of family labour.

Cost C2: Cost B2 + imputed value of family labour.

Cost C3: Cost C2 + 10 % of C2 (managerial cost)

Measures of Farm Profit

Gross Income: Yield in quintal × Price per tonne

Net Income: Gross Income – Cost C

Farm Business Income: Gross Income - Cost A2 or Net Income + imputed value of family labour.

Family labour income: Gross Income - Cost C

Benefit-cost ratio: Cost C / Gross Income

Results and Discussion

Per hectare costs of cultivation of Kala Namak rice crop:

Per hectare costs incurred on the various input factor in Kala Namak rice production was worked out and are given in Table:1. The table indicate that, costs of cultivation were highest on medium farms Rs.68664.21, followed by small farms Rs.68230.09 and marginal farms Rs.63052.36, respectively. The overall average costs of cultivation were observed Rs.65138.19 on sample farms. The major component of the cost was human labour 21.52 percent, land Preparation 21.24, rental value of land 13.82 percent, manure & fertilizers 9.17 percent machinery charge 8.04 percent, irrigation 6.99 percent, and seed and planting material 6.41 percent, respectively of the total costs of cultivation. Per hectare cost of cultivation was found of positive trend with farm size.

Per hectare costs and income from the production of Kala Namak rice crop

The Table: 2. revealed that, on an average cost A₁/A₂, cost B₁, cost B₂, cost C₁, cost C₂ and cost C₃ came to Rs. 43087.27, Rs. 43731.34, Rs.52731.34, Rs.50216.53, Rs. 59216.53 and Rs. 65138.19, respectively.

On an average, gross income was recorded Rs. 180256.08 and net return over C₃ came to Rs. 115117.90, respectively. On medium farms, gross income was highest, which was recorded Rs. 193435.00, followed by small farms Rs. 191895.00 and lowest on marginal farms *i.e.*, Rs. 172425.00, respectively. On an average family labour income and farm business income were observed to Rs. 127524.74 and Rs. 137168.81, respectively. Family labour income was highest on small farms followed by medium and marginal farms and farm business income was highest on small farms, followed by medium farms and marginal farms. On an average, the cost of production per quintal and yield of main product per hectare were estimated to Rs. 1989.01 per quintal and 32.77 quintal, respectively. On an average input output ratio regarding costs C₃, C₂, C₁, B₂, B₁, and A₂/A₁ were recorded 1:2.77, 1:3.04, 1:3.59, 1:3.42, 1:4.13 and 1:4.20, respectively. Benefit-cost ratio was highest on medium farms 1:2.82 followed by small farms 1:1.17 and marginal farms 1:1.13. Whereas the average benefit-cost ratio on overall farms comes to 1:2.77 and thus, it is concluded that Kala Namak rice cultivation is lucrative for the growers and also suitable for doubling the income of the farmers in the study area. On the basis of cost A₁ input output ratio was highest on marginal farms (1:4.30), followed by small (1:4.11) and medium farms (1:3.88), respectively. It may be concluded the costs of cultivation on different size group of farm increases with an increase in farm size.

Table 1: Per hectare cost of cultivation of Kala Namak rice on different size group of farms

S. No.	Particulars	Size group of farms			
		Marginal (73)	Small (31)	Medium (16)	Overall average
1.	Land Preparation	13052.45 (20.70)	15025.11 (22.02)	15101.78 (21.99)	13835.30 (21.24)
2.	Seed and Planting Material	5279.05 (8.37)	5791.42 (8.49)	5800.22 (8.45)	5480.90 (6.41)
3.	Manure and Fertilizer	5818.48 (9.23)	6165.25 (9.04)	6289.11 (9.16)	5970.81 (9.17)
4.	Human Labour	13598.07 (21.57)	14655.97 (21.48)	14713.18 (21.43)	14020.04 (21.52)
a.	Family	7635.45 (12.11)	5632.18 (8.25)	2889.87 (4.21)	6485.19 (9.96)
b.	Hired	5962.62 (9.46)	9023.79 (13.23)	11823.31 (17.22)	7534.85 (11.57)
5.	Machinery & equipment Cost	5023.18 (7.97)	5539.15 (8.12)	5606.82 (8.17)	5234.29 (8.04)
6.	Water & Irrigation	4458.83 (7.07)	4698.37 (6.89)	4712.94 (6.86)	4554.59 (6.99)
7.	Total Working Capital	47230.06 (74.91)	51875.27 (76.03)	52224.05 (76.06)	49095.94 (75.37)
8.	Interest on working capital	465.15 (0.74)	489.75 (0.72)	502.82 (0.73)	476.53 (0.73)
9.	Rental Value of land	9000.00 (14.27)	9000.00 (13.19)	9000.00 (13.11)	9000.00 (13.82)
10.	Interest on fixed capital	625.12 (0.99)	662.33 (0.97)	695.14 (1.01)	644.07 (0.99)
11.	Subtotal	57320.33 (90.91)	62027.35 (90.91)	62422.01 (90.91)	59216.53 (90.91)
12.	Managerial Cost @ 10 % of sub total	5732.03 (9.09)	6202.74 (9.09)	6242.20 (9.09)	5921.65 (9.09)
	Grand Total	63052.36 (100.00)	68230.09 (100.00)	68664.21 (100.00)	65138.19 (100.00)

Table 2: Per hectare costs and return of the Kala Namak Rice production in the study area (in Rs.)

S. No.	Particular	Size group of farms			Overall average
		Marginal (73)	Small (31)	Medium (16)	
1.	Cost A1/A2	40059.76	46732.84	49837.00	43087.27
2.	Cost B1	40684.88	47395.17	50532.14	43731.34
3.	Cost B2	49684.88	56395.17	59532.14	52731.34
4.	Cost C1	48320.33	53027.35	53422.01	50216.53
5.	Cost C2	57320.33	62027.35	62422.01	59216.53
6.	Cost C3	63052.36	68230.09	68664.21	65138.19
7.	Yield qtl/ha.				
a	Main Product	31.35	34.89	35.17	32.77
B	By Product	45.89	49.17	50.04	47.29
8.	Gross Income				
A	Main Product	172425.00	191895.00	193435.00	180256.08
b	By Product	13767.00	14751.00	15012.00	14187.20
9.	Net income	109372.64	123664.92	124770.79	115117.90
10.	Family Income	122740.12	135499.83	133902.86	127524.74
11.	Farm Business income	132365.24	145162.16	143598.00	137168.81
12.	Cost of production (Rs./Qtl.)	2011.24	1955.58	1952.35	1989.01
13.	Input-Output				
(i)	based on Cost A1/A2	1:4.30	1:4.11	1:3.88	1:4.20
(ii)	on the basis of cost B1	1:4.24	1:4.05	1:3.83	1:4.13
(iii)	on the basis of Cost B2	1:3.47	1:3.40	1:3.25	1:3.42
(iv)	on the basis of Cost C1	1:3.57	1:3.62	1:3.62	1:3.59
(v)	on the basis of Cost C2	1:3.01	1:3.09	1:3.10	1:3.04
(vi)	on the basis of Cost C3	1:2.73	1:2.81	1:2.82	1:2.77

Conclusion

The cost of cultivation of Kala Namak rice was highest under medium-sized sample farms mainly due to higher human labour charges. In this crop, the maximum cost was incurred on human labour charges having an overall average of 21.52 percent. On an overall average, the cost of

cultivation of Kala Namak rice was observed to be Rs.65138.19. Cost A₁, cost B₁ and cost B₂ were highest under medium size of sample farms. The overall average of Cost A₁, cost B₁ and Cost B₂ were worked out to be Rs. 43087.27, Rs. 43731.34 and Rs.52731.34, respectively, Gross income per hectare was observed highest under the

medium size of sample farms due to the high productivity of these farms. The reason for high productivity was encountered due to adopting better management practices HYV of seeds and timely sowing & transplanting and manure & fertilizers highly used by the farmers. The net return was highest under the medium size of sample farms and family labour income and farm business income were highest under the marginal size group of farms. The cost of production per quintal was lower under the medium size of sample farms. The overall average cost of production per quintal was Rs. 1989.01.

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