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Economic analysis and constraints faced by paddy-wheat rotation in Kaithal district of Haryana

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Abstract

The present study was conducted in Kaithal district of Haryana. The data was collected for paddy and wheat crops from 20 farmers of Sakra village during 2023-24. The result of the study revealed that the total cost and variable cost of cultivation of paddy (PR-126), paddy (CSR-30) and wheat cultivation were Rs. 136597 & Rs. 58697, Rs. 150926 & Rs. 70004 and Rs. 108061 & Rs. 39719 per hectare, respectively. The gross returns received from paddy (PR-126), paddy (CSR-30) and wheat were Rs. 187552, 214972 and Rs. 127091 per hectare, respectively. The cost benefit ratio recorded for paddy (PR-126), paddy (CSR-30) and wheat was 1.37, 1.42 and 1.18, respectively which was more than one indicated that cultivation of these crops in the study area was profitable. Constraints faced by farmers due to paddy wheat rotation in the study area were the high rental value of land as revealed by 80.00 per cent of the growers followed by problem of soil fertility (75.00%), problem of crop residue management (70.00%) and non-availability of quality seed (60.00%). For mitigating these constraints there must be need of diversification to improve soil health and crop residue management.

Keywords: Economic, constraints, variable cost, gross return, B-C ratio

Introduction

Rice and Wheat are two major crops in India, contributing significantly to the country's food security and economy. According to the data from the Indian Ministry of Agriculture and Farmers Welfare, the 5-year average production of rice in India from 2019-20 to 2023-24 was 128.49 lakh tons with an average area of 46.31 lakh hectares and average yield of 4.2 tons per hectare, while the production of wheat during the same period averaged 107.12 lakh tons with an average area of 30.73 lakh hectares and an average yield of 3.5 tons per hectare. These statistics highlight the significant contribution of rice to India's agricultural output (Foreign Agricultural Service, 2024)^[3].

In Haryana during the year 2022-23, Rice was cultivated over an area of 1661.28 thousand ha and a yield of 3564.40 kg/ha was obtained and the state contributed in 5921.47 thousand tonnes of rice production. On the other hand, wheat was cultivated over an area of 2375.8 thousand ha with a yield of 4684 kg/ha and a total production of 11127.64 thousand tonnes of production was contributed by the state (Anonymous, 2024)^[1].

The output of wheat and rice in the country has reached a saturation point. But, farmers in agriculturally advanced states like Punjab and Haryana still prefer to grow wheat and rice despite being aware of problems created by this crop rotation in terms of deteriorating soil health and depleting water table. The production, productivity and profitability which reached a plateau in leading green revolution states, started plummeting in early eighties. These developments made clear that the country would have a surplus of superior cereals and therefore, farmers should

diversify towards other crops by increasing area under pulses, oilseeds, fruits, vegetables and commercial crops. With this realization, crop pattern in several states experienced significant change with diversification from traditional food crops to commercial crops, plantation crops and horticultural crops (Vyas, 1996; Nadkarni, 1996; Joshi *et.al.*, 2004; Joshi 2014)^[11, 7, 4, 5]. Thus, the monoculture of rice wheat crop rotation in several districts of Haryana particularly in areas with assured irrigation has led to over exploitation of natural resources, degradation in soil fertility and higher susceptibility of crops to the attack of various insects, pests and diseases. Moreover, profitability from these crops has almost stagnated due to stagnating yields and rising input costs including human labour. In such circumstances, crop diversification towards coarse cereals, pulses, oilseeds, fruits, vegetables and commercial crops is being advocated as a future strategy in order to improve income of the farmers and to save natural resources from further degradation.

Materials and Methods

The present study was conducted in Kaithal district of Haryana. The data was collected for paddy and wheat crops from 20 farmers of Sakra village during 2023-24 under RAW (Rural Agricultural Work Experience) Program. The data was collected from pre-tested schedules. Statistical tools like mean, percentage were used to analyse the data.

Results and Discussion

The item wise break-up of cost of cultivation of paddy (PR-126), Paddy (CSR-30) and wheat crops in Kaithal district

are presented in table 1. Per hectare total cost of paddy (PR-126) and paddy (CSR-30) in Kaithal were Rs. 136597 and Rs. 150926, respectively. Total variable cost was Rs. 58697 and Rs. 71004 in Kaithal district, respectively. Expenditure on field preparation, seed & sowing, manure & fertilizers, plant protection chemicals, irrigation and harvesting & threshing were the important component of total variable cost. The highest expenditure incurred in the cultivation of paddy (PR-126) on field preparation was (10.46%) followed by plant protection chemicals (9.16%), seed & sowing (8.59%), manure & fertilizers (6.15%), irrigation (3.73%) and harvesting & threshing (3.43%) in Kaithal district, respectively. Similarly, rental value of land, management & risk factor and transportation cost were the major components of fixed cost in paddy (PR-126). The rental value of land was the highest which accounted for Rs. 68301 per hectare (50.00%) of the total cost followed by management & risk factor (6.34%) and transportation cost (0.68%), respectively. The gross return of paddy (PR-126) cultivation in Kaithal district was Rs. 187552 per hectare. The return over variable cost and net return were Rs. 128855 & Rs. 50955 per hectare, respectively. The cost benefit ratio in Kaithal district was 1.37. Similar findings were also observed by Saini *et al.*, 2019^[8].

Similarly, per hectare total cost and variable cost of cultivation of paddy (CSR-30) in Kaithal were Rs. 150926 and 71004 per hectare, respectively. The highest expenditure incurred in the cultivation of paddy (CSR-30) on harvesting & threshing (10.43%) followed by field preparation was (9.39%) plant protection chemicals (8.53%), seed & sowing (8.44%), manure & fertilizers (5.46%) and irrigation (3.21%) in Kaithal district, respectively. Similarly, rental value of land, management & risk factor and transportation cost were the major components of fixed cost in paddy (CSR-30). The rental value of land was the highest which accounted for Rs. 69220 per hectare (45.86%) of the total cost followed by management & risk factor (6.53%) and transportation cost (0.57%), respectively. The gross return of paddy (CSR-30)

cultivation in Kaithal district was Rs. 214972 per hectare. The return over variable cost and net return were Rs. 143968 and Rs. 64046 per hectare, respectively. The cost benefit ratio in Kaithal district was 1.42. Similar findings were also observed by Kamboj *et al.*, 2021^[6].

The per hectare total cost and variable cost of cultivation of wheat in Kaithal were Rs. 108061 and 39719 per hectare, respectively. The highest expenditure incurred in the cultivation of wheat on harvesting & threshing (11.15%) followed by field preparation was (9.87%), manure & fertilizers (7.32%), seed & sowing (3.29%), plant protection chemicals (2.72%), and irrigation (1.15%) in Kaithal district, respectively. Similarly, rental value of land, management & risk factor and transportation cost were the major components of fixed cost of wheat cultivation. The rental value of land was the highest which accounted for Rs. 62059 per hectare (57.43%) of the total cost followed by management & risk factor (5.05%) and transportation cost (0.77%), respectively. The gross return of wheat cultivation in Kaithal district was Rs. 127091 per hectare. The return over variable cost and net return were Rs. 87371 and Rs. 19030 per hectare, respectively. The cost benefit ratio in Kaithal district was 1.18. Similar findings were also observed by Tripathi and Singh 2018^[10].

Constraints faced by farmers in paddy-wheat cultivation

The constraints faced by growers in cultivation of paddy-wheat are presented in table 2. Major constraints were the high rental value of land as revealed by 80.00 per cent of the growers. It was due to compaction among the paddy growers and assured MSP and high market price in the market of paddy crop followed by problem of soil fertility due to paddy-wheat rotation (75.00%). The soil health deteriorates because of paddy-wheat rotation (Debangshi and Ghosh, 2022)^[2], problem of crop residue management (70.00%), non-availability of quality seed (60.00%), shortage of human labour (55.00%) and problem of water drainage during rainy season (40.00%) Similar observations were also reported by Singh (2011)^[9].

Table 1: Cost and returns of paddy and wheat cultivation in Kaithal district of Haryana during 2023-24 (Rs./ha.)

S. No.	Particulars	HYV		CSR-30		Wheat	
		Qty	Value	Qty	Value	Qty	Value
1	Field Preparation	6.4	14282 (10.46)	6.3	14166 (9.39)	5.3	10667 (9.87)
2	Seed (Kg.) & sowing	11.5	11738 (8.59)	10.6	12735 (8.44)	101.7	3558 (3.29)
3	Manure & fertilizer		8398 (6.15)		8244 (5.46)		7915 ((7.32)
4	Irrigation	16.7	5096 (3.73)	15.9	4841 (3.21)	3.5	1245 (1.15)
5	Plant protection chemicals (Weeds, insect pests and disease control)		12517 (9.16)		12868 (8.53)		2944 (2.72)
6	Harvesting & Threshing		4681 (3.43)		15749 (10.43)		12047 (11.15)
	Total (1 to 6)		56712 (41.52)		68603 (45.45)		38376 (35.51)
7	Interest on working Capital		1985 (1.45)		2401 (1.59)		1343 (1.24)
8	Variable cost		58697 (42.97)		71004 (47.05)		39719 (36.76)
9	Management & risk factor		8666 (6.34)		9848 (6.53)		5456 (5.05)
10	Transportation		933 (0.68)		853 (0.57)		827 (0.77)
11	Rental value of land		68301 (50.00)		69220 (45.86)		62059 (57.43)
12	Total Cost		136597 (100.00)		150926 (100.00)		108061 (100.00)
13	(a) Main production (qt)	84.0	185052	35.8	204121	56.3	119531
14	(b) By Product		2500		10851		7560
15	Gross return		187552		214972		127091
16	Return over variable cost		128855		143968		87372
17	Net return		50955		64046		19030
18	B: C		1.37		1.42		1.18

Note: Figures in parentheses indicate the percentages to the total cost

Table 2: Constraints faced by farmers for the cultivation of paddy wheat in Kaithal district of Haryana n = 20

S. No.	Production constraints	No. of respondents	Percentage
1	High rental value of land	16	80.00
2	Problem of soil fertility due to paddy-wheat rotation	15	75.00
3	Problem of crop residue management	14	70.00
4	Non-availability of quality seed	12	60.00
5	Shortage of human labour	11	55.00
6	Water drainage problem during rainy season	8	40.00

Conclusion

The study concluded that total cost and variable cost of cultivation of paddy (PR-126), paddy (CSR-30) and wheat cultivation were Rs. 136597 & Rs. 58697, Rs. 150926 & Rs. 70004 and Rs. 108061 & Rs. 39719 per hectare, respectively. The gross returns received from paddy (PR-126), paddy (CSR-30) and wheat were Rs. 187552, 214972 and Rs. 127091 per hectare, respectively. The cost benefit ratio recorded for paddy (PR-126), paddy (CSR-30) and wheat was 1.37, 1.42 and 1.18, respectively which was more than one indicated that cultivation of these crops in the study area was profitable. Meanwhile there were constraints faced by farmers due to paddy wheat rotation in the study area were the high rental value of land as revealed by 80.00 per cent of the growers followed by problem of soil fertility (75.00%), problem of crop residue management (70.00%) and non-availability of quality seed (60.00%). For mitigating these constraints there must be need of diversification to improve soil health and crop residue management.

References

1. Anonymous. [Internet]; c2024. Available from: <https://agriharyana.gov.in/fasalbima/Documents/Scheme/AYP.pdf>. Accessed [Date of Access].
2. Debangshi U, Ghosh P. Rice wheat cropping systems-constraints and strategies: A review. *Plant Arch.* 2022;22(1):19-28.
3. Foreign Agricultural Service. [Internet]; c2024. Available from: <https://ipad.fas.usda.gov/countrysummary/default.aspx?id=IN>. Accessed [Date of Access].
4. Joshi PK, Gulati A, Birthal PS, Tewari L. Agriculture diversification in South Asia: Patterns, determinants and policy implications. *Econ Polit Wkly.* 2004;39(24):2457-2467.
5. Joshi PK. Agricultural diversification in India impact for inclusiveness. In: Presidential address for 28th National conference of the Indian Society of Agriculture Marketing; Sardar Patel University, Gujarat; c2014 Dec.
6. Kamboj P, Kumar S, Sanjay. Economic analysis of basmati cultivation in Haryana. *The Pharma Innovation J.* 2021;SP-10(11):2948-2953.
7. Nadkarni MV, Vedini KH. Accelerating commercialization of agriculture: Dynamic agriculture and stagnating peasants. *Econ Polit Wkly.* 1996;3(26)
8. Saini S, Nimbrayan PK, Amar Jeet. An economic analysis of wheat and paddy cultivation in Kurukshetra District of Haryana. *Int Arch Appl Sci Technol.* 2019;10(3):28-31.
9. Singh M. Yield gap and production constraints in rice-wheat system: Scenario from eastern Uttar Pradesh.

Bangladesh J Agric Res. 2011;36(4):623-632.

10. Tripathi AK, Singh JP. An economic analysis of production and marketing of wheat in Ghazipur District of Eastern U.P. *J Pharmacogn Phytochem.* 2018;SP1:1686-1688.
11. Vyas VS. Diversification in agriculture: Concept, rationale and approaches. *Indian J Agric Econ.* 1996;5(4):636-646.