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Assessing the Present Status and Future Strategies of Custom Hiring of Agricultural Machinery in Paddy Farm in Bilaspur, Chhattisgarh, 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 study aims to examine the present status and future strategies of custom hiring of agricultural machinery in paddy farms in Bilaspur district of Chhattisgarh, India. Eighty farmers were selected randomly from Pendra and Marwahi block of Bilaspur district of Chhattisgarh state. The study concluded that on an average land holding size was 3.15 hectares and average family size was observed 4.6 at the sampled farms. About 75 percent of the farmers used machines for cultivation of paddy crop. Out of which this 76.66 percent farmers hired machinery. About 64.28 percent of tractor owner were large farmers and only 37.71 percent tractor owners belonged to small and medium size categories. The total cost of cultivation of paddy was found to be Rs. 35301.00, Rs.33804.28, Rs.34756.71 and Rs.31559.88 per hectare at traditional method, machinery method (broadcasting), machinery method (transplanting) and line sowing method respectively. Productivity

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of paddy in transplanting method using machine was higher (45 quintal per hectare) followed by line sowing (43 quintals per hectare). Input-output ratio in line sowing method was 1:2.07, which was higher as compared to other methods of cultivation. Lack of availability of machinery in time was major constraints accounting 41.25 percent of the selected farmers. The state government should develop the Agro-Service centres on cooperative management basis at panchayat level for such services and take steps like fixing the custom hiring rates, reducing fuel costs and creating more awareness about custom hiring of farm machinery. This would particularly be beneficial to the small farmers to cut down their cost of production, enhance productivity and increase their net farm incomes.

Keywords: Custom hiring cost of cultivation; output and benefit-cost ratio of paddy; farm mechanization; comparative economics of custom hiring.

1. INTRODUCTION

Chhattisgarh is the 26th state of India. The total geographical area is 137.90 lakh hectares. Out of which cultivated area is 46.77 lakh hectares. Agriculture is the primary occupation of the people of Chhattisgarh. According to a government estimate, net sown area of the state is 4.828 million hectares and the gross sown area is 5.788 million hectares. About 80 percent of the population of the state is rural and the main livelihood of the villagers is agriculture base small industry. In Chhattisgarh farm power availability is 0.60 kW/ha against national average of 1.53 kW/ha. The medium and large land holding constitutes 11.2% and 10.22% respectively of total holdings. The marginal farmers are not in a position to purchase improved implements due to their poor economic conditions [1-3].

Due to use of traditional method which causes it is difficult to complete in various farm operations in timely manners which required in production process of crops. Farm mechanization has been helpful to bring about a significant improvement in agricultural productivity and help to complete various farm operations in timely manners. Due to high cost of farm machinery and large agriculture land hold by small and marginal farmers, they are not in position to purchase farm machinery by as an owner based. In this context, establishing custom hiring or farm service centres facilitated use of farm machine farmers.

2. METHODOLOGY

Chhattisgarh state consist 27 districts, out of which Bilaspur district was selected purposively for the present study. There are seven blocks namely Bilha, Kota, Pendra, Marwahi, Masturi, Gourella, and Bilaspur. Out of these, Pendra and Marwahi block will be selected purposively as they have larger area under Paddy crop. The Pendra and Marwahi block has 52 and 100 of village out of which 2 village from each are randomly selected. Namely Patgawa and Bandhi village from Pendra, Maladad and Karhani from Marwahi block.

The primary data were collected from the farmers through personal interview with the help of well-prepared schedule and questionnaire. The required information is collected from the farmers for the kharif crop 2015-16, the secondary data collected from the Department of Agriculture, Government of Chhattisgarh, Raipur, District planning and statistics Department, Raipur.

2.1 Objectives

The specific objective of the present study was 1.To examine the comparative economics of custom hiring and traditional methods in different operation of paddy cultivation [4,5].

3. RESULTS AND DISCUSSION

3.1 General Characteristics of Sample Farmers

The general characteristics of the sample household are presented in Table 1. It is evident from table that, the average land holding size was 3.15 hectares and average family size was observed 4.6 at the sampled farmers. The literacy rate in the selected household was 56.78 percent. From selected 80 farmers, 25.0, 18.75, 18.75 percent of farmers are belonging to marginal, medium and large category respectively. About 37.5 percent of farmers are belonging to small farmer's categories. About 64.00 percent, 34.00 percent and 2.00 percent

area was sowing under broadcasting, transplanting and line sowing method respectively. Canal, stop dam, tube well and ponds etc. were the major sources of irrigation in the study area. About 50 percent and 31.25 percent of farmers were belonged to the schedule tribe and other backward caste respectively. Paddy was the major crop grown by the sampled household [6,7].

Table 1. General characteristics of sampled households

S. No	Particulars	No.
1	No. of Selected Farmers	80.00
2	Average size of land holding (ha)	3.15
3	Average Family Size	4.6
4	Literacy Percent	56.78
5	Caste Wise selected Farmers (%)	
A	ST	50
B	SC	11.25
C	OBC	31.25
D	GENERAL	7.5
6	Categories Wise Farmers (No.)	
A	Marginal Farmers	20
B	Small Farmers	30
C	Medium Farmers	15
D	Large Farmers	15
7	Total Paddy Area (ha)	252 (100)
A	Broadcasting Area (ha)	161.28 (64.00)
B	Transplanting Area (ha)	85.68 (34.00)
C	Line Sowing Area (ha)	5.04 (2.00)
8	Major source of irrigation	Canal, Stop dam, Tube well.
9	Major crop	Paddy

Note: - Figures in parentheses indicate percent to total paddy area

3.2 Cost of Cultivation of Paddy under Different Method of Sowing

The cost of cultivation of paddy by different methods is presented in Table. 2. The operations were field preparation, manure, sowing, and fertilizer application, inter culture operation, plant protection, irrigation, harvesting, transportation, harvesting and winnowing. The total cost estimated were Rs. 35301.00, Rs.33804.28, Rs.34756.71 and Rs.31559.88 per hectare at traditional method, machinery method (broadcasting), machinery method (transplanting) and line sowing method. The manure and fertilizer was the major cost item in paddy production in all the method of cultivation.

In traditional method, fertilizer and manure are highly cost intensive, it contribute 16.68 percent to the total cost of cultivation which was Rs. 5890. Biasi, sowing, harvesting; transportation and threshing operation contribute Rs.5400, Rs.2672.50, Rs.3656.25, Rs.4390 and Rs.4160 to the total cost of cultivation which is 15.30 percent, 7.57 percent, 10.37 percent, 12.43 percent and 11.78 percent respectively. In line sowing method harvesting operation was performed by reaper due to this crop were required to be collected from the field. Total contribution in fertilizer and manure, wedding, harvesting, plant protection, transportation and sowing were Rs.5962.5, Rs. 4275.00, Rs.4250.00, Rs.3623.00, Rs.4012.00 and Rs.1355.00 which was 18.89 percent, 13.54 percent, 13.46 percent, 11.47 percent, 12.71 percent and 4.29 percent respectively to the cost of cultivation. In machine broadcasting method only biasi operation was done through bullock labour. In machine transplanting method nursery was prepared for seedling and then transplanting of seedling was done through human labours. Costs of cultivation in machinery method were lower as compared to traditional (Bullock Power), due to bullock labour was replaced by machinery power in land preparation, transportation, threshing operation.

3.3 Output and Benefit-Cost ratio of Paddy under different Method of Sowing

Productivity of paddy by different methods is presented in Table 3.It is clear from figure that per hectare productivity of paddy was more in machinery method (transplanting) as compared to other methods. It is 45.00 quintals in machinery method (transplanting). Productivity of paddy in traditional method, machinery method (broadcasting) and line sowing was 38 quintals, 40 quintals and 43 quintals per hectare respectively.

The per hectare gross return was estimated as Rs.58220, Rs.61330, Rs.68475.00 and Rs.65530.00 in traditional method, machinery method (broadcasting) and machinery method (transplanting) and line sowing. Benefit-Cost ratio in line sowing method was 1:2.07, which was higher as compared to other method of

cultivation. In traditional method, machinery method (broadcasting) and machinery method (transplanting) Benefit cost ratio were 1:1.64, 1:1.81 and 1:1.97 respectively. Productivity in

Table 2. Cost of cultivation of paddy under different method of sowing

S. No	Particulars	Traditional method	Machinery method (Broadcasting)	Machinery method (Transplanting)	Line Sowing method
1	Field preparation	2750 (7.79)	2400 (7.09)	4300 (12.37)	3600 (11.40)
2	Nursery + Sowing/ Transplanting	2672.50 (7.57)	2236.25 (6.61)	5816.25 (16.73)	1355 (4.29)
3	Appl. of Fertilizer &Manure	5890 (16.68)	5870.00 (17.36)	6097.5 (17.54)	5962.5 (18.89)
4	Biasi	5400 (15.30)	5400 (15.97)	0	0
5	Weeding	2250 (6.37)	2250.00 (6.65)	2025 (5.82)	4275.00 (13.54)
6	Plant protection	3122.5 (8.85)	3453.75 (10.26)	3630 (10.45)	3623.00 (11.47)
7	Harvesting	3656.25 (10.37)	3937.50 (11.65)	3937.50 (11.33)	4250 (13.46)
8	Transportation	4390 (12.43)	3890.00 (11.51)	4140 (11.92)	4012.00 (12.71)
9	Threshing	4160 (11.78)	3360.00 (9.93)	3472.50 (9.99)	3472.50 (11.00)
10	Winnowing	780 (2.21)	774.50 (2.29)	850 (2.45)	572.5 (1.81)
11	Irrigation Charges	229.75 (0.65)	232.28 (0.68)	487.96 (1.40)	437.38 (1.38)
	Total	35301.00 (100)	33804.28 (100)	34756.71 (100)	31559.88 (100)

Note: - Figures in parentheses indicate percent to total paddy area

Table 3. Output and benefit-cost ratio of paddy under different method of sowing (Rs/Ha.)

S. No	Particulars	Traditional method	Machinery method (Broadcasting)	Machinery method (Transplanting)	Line Sowing method
1	Area (ha)	1	1	1	1
2	Productivity(Q/Ha)	38	40	45	43
3	Price of paddy (Rs./Q)	1360.00	1360.00	1360.00	1360.00
4	Total value of paddy	51680.00	54400.00	61200.00	58480.00
5	Straw production (Q/Ha.)	43.60	46.20	48.5	47
6	Value of By Product (Rs./Q)	150	150	150	150
7	By Product Value	6540	6930	7275	7050
8	Total Return (4+ 7)	58220.00	61330.00	68475.00	65530.00
9	Total cost (Rs./Ha)	35301.00	33804.28	34756.71	31559.88
10	Net Benefit	22919	27525.72	33718.29	33970.12
11	B C Ratio	1:1.64	1:1.81	1:1.97	1:2.07

machinery method used farms was higher as compare to Traditional Method (Bullock Power) used farms, due to timely completing in sowing, transplanting, threshing etc. operation which increased the production of paddy.

4. CONCLUSIONS

The study concluded that on an average land holding size was 3.15 hectares and average family size was observed 4.6 at the sampled farms. The total cost of cultivation of paddy was found to be Rs. 35301.00, Rs.33804.28, Rs.34756.71 and Rs.31559.88 per hectare at traditional method, machinery method (broadcasting), machinery method (transplanting) and line sowing method respectively. The state government should develop the Agro-Service centres on cooperative management basis at panchayat level for such services and take steps like fixing the custom hiring rates, reducing fuel costs and creating more awareness about custom hiring of farm machinery. This would particularly be beneficial to the small farmers to cut down their cost of production, enhance productivity and increase their net farm incomes.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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