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Impact assessment of custom hiring centres on farm mechanization: A quantitative research in Chhattisgarh state

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Abstract

The present study was conducted to find out the impact of Custom Hiring Centres on Farm Mechanization in Chhattisgarh State. Regarding rice cultivation, labour requirements change was found by 42.55 per cent during the Kharif season and 42.85 per cent during the Rabi season after the implementation of CHCs. For other crops in the Rabi season, labour requirements change was 37.50 per cent, 33.33 per cent, 28.57 per cent and 26.00 per cent for wheat, groundnut, chickpea and maize, respectively. The regarding cost of cultivation for rice crop change was observed 16.96 and 15.19 per cent in the Kharif and Rabi seasons, respectively. Cost changes for other crops in the Rabi season, were 20.53 per cent, 19.43 per cent, 15.58 per cent, and 12.79 per cent for wheat, chickpea, maize and groundnut, respectively. Productivity for rice changed by 14.70 and 16.49 per cent in the Kharif and Rabi seasons, respectively, while productivity changes for other crops in the Rabi season were 23.11 per cent, 21.16 per cent, 15.62 per cent, and 6.97 per cent for chickpea, wheat, groundnut and maize, respectively. Overall, 57.47 per cent of respondents had observed a medium-level impact, 25.32 per cent observed a high-level impact, and 17.21 per cent reported low-level impact from CHCs.

Keywords: Custom Hiring Centres, impact, interview schedule.

Introduction

The Indian economy is based primarily on agriculture. It has an important role to play in the country's economic development. With ever increasing human population, there is an increasing demand to raise the production. There are two main strategies to boost production: the first is to expand agricultural operations into non-cultivated areas, thereby increasing the cultivated area; the second is to increase the productivity of the existing cultivated land. As there is almost no scope to expand the cultivated area because the average size of land holding is decreasing day by day due to pressure of increasing population, the ultimate way of increasing production is to raise the productivity level. Mechanization of the farm is one of the most significant aspects of raising production levels among all the other methods like using high yielding varieties, applying fertilizer, and taking plant protection measures. In India, mechanical power utilization is highest at approximately 3.5 kW/ha in Punjab, while in states like Bihar, Orissa, and Jharkhand, it is below 1 kW/ha. Developing innovative crop-specific farm equipment and making them available at modest price so as to enhance the level of mechanization would contribute in the long run to increase the output. As demand increases and drives output growth, it will also create new employment opportunities on the farm. (Rajyalaxmi, 2019) [5].

Mechanization, while pivotal in enhancing agricultural productivity, brings its own set of challenges. The high costs associated with modern machinery often make it inaccessible to individual farmers, especially those with limited resources. This is particularly evident in the Indian agricultural landscape. Despite the clear advantages of mechanization, a significant number of farmers, especially the small and marginal ones, struggle to access timely modern farming tools (Singh *et al.*, 2022) [6]. Fragmentation of farm land holdings further complicates the scenario, with the average size of farm holdings decreasing from 2.82 ha in 1970–71 to 1.1 ha in 2010–11 (Tiwari, *et al.*, 2019) [7].

Custom Hiring Centres (CHC) were established by the government to promote farm mechanisation through subsidies and to assist small and marginal farmers who are unable to afford to buy and maintain high-tech and expensive farm machineries in order to help them meet the availability of specific machinery for various operations. The Custom Hiring Centres are essentially a collection of farm machinery, implements, and equipment that farmers can rent on a hired basis. The Custom Hiring Centres were built as another institutional intervention to sustainably

adapt to climate resilient technology. The primary goal of Custom Hiring Centres is to provide farm equipment to small, marginal, and low-income farmers on a rental basis at discounted rates, as well as to enhance the quality, boost crop production, and accelerate the timeliness and efficiency of agricultural operations. This makes it possible for small and marginal farmers to start their farming operations on time (Bharathi *et al.*, 2022) [1].

Chinnappa *et al.* (2018) [2] in her study on economic impact of CHC in maize cultivation in Karnataka revealed that the maize farmers have an additional profit and saved the cost of cultivation by availing services from CHC when compared to private individual farmers. The findings showed that CHC's performance in terms of net returns was determined to be negative, which was caused by the centres' dead investment. Custom hiring centres formed at block level and village level assisted in bringing the additional area of about 400 to 600 ha under cultivation in their operations and also found that the average income generated was varying from Rs.0.5 million to Rs.1.5 million. Murugesan (2019) [4]. Hiremath *et al.* (2015) [3] assessed the performance of CHC established by PACS and it revealed that the private owners charge higher hiring charges compared to CHC and also helped the small and marginal farmers to increase the productivity and income to the extent of 10 to 15%.

Material and Methods

The study was conducted in five selected districts of Chhattisgarh plains *viz*. Raigarh, Rajnandgaon, Raipur, Durg and Dhamtari districts of Chhattisgarh state during the year 2023-24. Because these districts were having maximum custom hiring centres. There are 778 custom hiring centres are working in selected districts, out of which 10 per cent custom hiring centres were selected and 4 beneficiary farmers from each custom hiring centres were selected purposively. In this way total 385 (77x4=308+77) respondents (77 service providers of CHC's and 308 beneficiary farmers) were selected. Primary data were collected through personal interview with the help of pre-tested structured interview schedule. Collected data were tabulated and processed by using appropriate statistical tools.

Results and Discussion

Impact of custom hiring centres on farm mechanization

1. Impact of Custom hiring centres on labour requirement

Regarding the impact of custom hiring centers on labour requirements as shown in Table 1, revealed that in the Kharif season, the labour requirement for rice cultivation was observed to be 47 laborers per acre. In the Rabi season, the labour requirements for rice, wheat, maize, chickpea, and groundnut were observed to be 49, 16, 50, 14, and 24 laborers per acre, respectively. A reduction in the number of laborers required was observed when adopting farm machinery and implements hired from CHCs. After using these farm machinery and implements from CHCs, the labour requirement for rice in the Kharif season was observed to be 27 laborers per acre. In the Rabi season, the labour requirements for rice, wheat, maize, chickpea, and groundnut were observed to be 28, 10, 37, 9, and 16 laborers per acre, respectively.

Regarding rice crop, labour requirements during the Kharif season showed 42.55 per cent difference between before and after the implementation of CHCs, during the Rabi season, 42.85 per cent change was observed. It reveals that there was a reduction in labour requirements in Kharif season in rice crop.

During the Rabi season, the percentage changes in labour requirements for wheat, groundnut, chickpea and maize crops were found to be 37.50 per cent, 33.33 per cent 28.57 per cent and 26.00 per cent, respectively. It reveals that there was a reduction in labour requirements in Kharif season in wheat, groundnut, chick pea and maize crops.

Table 1: Impact of Custom hiring centres on labour requirement

Sl. No	Crop	Labour requirement /Acre in Kharif season			Labour requirement /Acre in Rabi season		
		Before CHC	After CHC	Percentage change	Before CHC	After CHC	Percentage change
1.	Rice	47.00	27.00	42.55	49.00	28.00	42.85
2.	Wheat	0.00	0.00	0.00	16.00	10.00	37.50
3.	Maize	0.00	0.00	0.00	50.00	37.00	26.00
4.	Chickpea	0.00	0.00	0.00	14.00	9.00	28.57
5.	Groundnut	0.00	0.00	0.00	24.00	16.00	33.33

2. Impact of Custom hiring centres on total cost of cultivation

Regarding the impact of custom hiring centers on the cost of cultivation as shown in Table 2, it is revealed that in the Kharif season, the total cost of cultivation for the rice crop was observed to be Rs. 20,644.48 per acre. In the Rabi season, the total cost of cultivation for rice, wheat, maize, chickpea, and groundnut was observed to be Rs. 21,220.98 per acre, Rs. 11,310.97 per acre, Rs. 23,523.80 per acre, Rs. 8,048.38 per acre, and Rs. 23,740.74 per acre, respectively. A reduction in the total cost of cultivation was observed by adopting farm machinery and implements hired from CHCs. After using these farm machinery and implements from CHCs, the total cost of cultivation for rice in the Kharif season was observed to be Rs. 17,141.23 per acre. In the Rabi season, the total cost of cultivation for rice, wheat, maize, chickpea, and groundnut was observed to be Rs. 17,995.53 per acre, Rs. 8,987.80 per acre, Rs. 19,857.14 per acre, Rs. 6,483.87 per acre, and Rs. 20,703.70 per acre, respectively.

Regarding rice crop, cost of cultivation during the Kharif season showed 16.96 per cent difference between before and after implementation of CHCs, during the Rabi season 15.19 per cent change was observed. It reveals that there was a reduction in cost of cultivation in Kharif season in rice crop.

During the Rabi season, the percentage change in cost of cultivation for wheat, chickpea, maize and groundnut crops were found to be 20.53 per cent, 19.43 per cent, 15.58 per

cent and 12.79 per cent, respectively. It reveals that there was a reduction in cost of cultivation in Kharif season in wheat, chickpea maize and groundnut crops.

Table 2: Impact of custom hiring centres on total cost of cultivation

Sl. No	Crop	Total cost Rs./Acre in Kharif season			Total cost Rs./Acre in Rabi season		
		Before CHC	After CHC	Percentage change	Before CHC	After CHC	Percentage change
1.	Rice	20644.48	17141.23	16.96	21220.98	17995.53	15.19
2.	Wheat	0.00	0.00	0.00	11310.97	8987.80	20.53
3.	Maize	0.00	0.00	0.00	23523.80	19857.14	15.58
4.	Chickpea	0.00	0.00	0.00	8048.38	6483.87	19.43
5.	Groundnut	0.00	0.00	0.00	23740.74	20703.70	12.79

3. Impact of Custom hiring centres on productivity

Regarding the impact of custom hiring centers on productivity as shown in Table 3, it is revealed that in the Kharif season, the productivity of the rice crop was observed to be 19.24 quintals per acre, and in the Rabi season, the productivity of rice, wheat, maize, chickpea, and groundnut crops were observed to be 20.49, 6.52, 25.80, 5.58, and 13.38 quintals per acre, respectively. An increase in productivity was observed by adopting the farm machinery and implements hired from CHCs. After using these farm machinery and implements from CHCs, the productivity of rice crop in the Kharif season was observed to be 22.07 quintals per acre, and in the Rabi season, the productivity of rice, wheat, maize, chickpea, and groundnut crops were observed to be 23.87, 7.90, 27.60, 6.87, and 15.47 quintals per acre, respectively.

Table 3: Impact of Custom hiring centres on productivity

Sl. No	Crop	Productivity Q /Acre in Kharif season			Productivity Q /Acre in Rabi season		
		Before CHC	After CHC	Percentage change	Before CHC	After CHC	Percentage change
1.	Rice	19.24	22.07	14.7	20.49	23.87	16.49
2.	Wheat	0.00	0.00	0.00	6.52	7.90	21.16
3.	Maize	0.00	0.00	0.00	25.80	27.60	6.97
4.	Chickpea	0.00	0.00	0.00	5.58	6.87	23.11
5.	Groundnut	0.00	0.00	0.00	13.38	15.47	15.62

Regarding rice crop, productivity during the Kharif season showed 14.70 per cent difference between before and after implementation of CHCs, during the Rabi season 16.49 per cent change was observed. It reveals that there was a increase in productivity in rice crop in Kharif season.

During Rabi season, the percentage change in productivity for chickpea, wheat, groundnut and maize crops were found to be 23.11 per cent, 21.16 per cent, 15.62 per cent and 6.97 per cent, respectively. It reveals that there was a increase in productivity in chickpea, wheat, groundnut and maize crops in Kharif season.

4. Overall impact of custom hiring centres on farm mechanization

The overall impact of custom hiring centres on farm mechanization is presented in Table 4.42 shows that majority (57.47%) of respondents were found medium level impact, followed by 25.32 per cent of respondents were found high level impact and 17.21 per cent of respondents were found low level impact on their farm mechanization.

Table 4: Distribution of respondents according to overall impact of custom hiring centres on farm mechanization

Sl. No	Category	Frequency	Percentage
1.	Low level impact (Score up to 16)	53	17.21
2.	Medium level impact (Score 17 to 23)	177	57.47
3.	High level impact (Score more than 23)	78	25.32

Conclusion

It may be concluded that, regarding rice cultivation, labour requirements change was found by 42.55 per cent during the Kharif season and 42.85 per cent during the Rabi season after the implementation of CHCs. For other crops in the Rabi season, labour requirements changed was 37.50 per cent, 33.33 per cent, 28.57 per cent, and 26.00 per cent for wheat, groundnut, chickpea and maize, respectively. The cost of cultivation for rice change was observed by 16.96 per cent in the Kharif season and 15.19 per cent in the Rabi season. For other crops in the Rabi season, cost changes were 20.53 per cent, 19.43 per cent, 15.58 per cent, and 12.79 per cent for wheat, chickpea, maize and groundnut, respectively. For productivity for rice crop change was 14.70 per cent in the Kharif season and 16.49 per cent in the Rabi season, while productivity change was found for other crops in the Rabi season were found 23.11 per cent, 21.16 per cent, 15.62 per cent, and 6.97 per cent for chickpea, wheat, groundnut and maize, respectively. Overall, 57.47 per cent of respondents were observed medium-level impact, 25.32 per cent observed high-level impact, and 17.21 per cent reported low-level impact from CHCs.

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