

Empowering farmers through custom hiring centers

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Agricultural mechanisation is one of the solutions to increase efficiency of the farms especially in times of labour scarcity. Despite tremendous advancements, mechanisation levels are still only 40–45% in India. This is primarily because of fragmented landholdings and higher cost of modern machineries, which prevents the small and marginal farmers from owning it. Custom Hiring Centers (CHCs) have become a viable way to abridge the affordability gap by renting out farm machineries. It emphasises how they contribute to inclusive mechanisation, increase farm profitability, and reduce cultivation cost. However, their potential is still limited by issues like uneven regional distribution, high rental cost, low farmer awareness, and a lack of machinery during peak season. Additionally, there are still knowledge gaps in the areas like equitable access for marginalised groups, long-term environmental impacts, and gender inclusion. This article provides details of CHCs working, their advantages and challenges in their implementation with special context to Bihar state.

Keywords: Agricultural machinery, Conservation agriculture, Crop production, Drudgery reduction

AGRICULTURE and animal husbandry is a major means of livelihood in rural areas, in which more than 50 percent of families in rural areas are directly connected and more than 80 percent of families are indirectly connected. While women also play an important role in agriculture and animal husbandry work, their participation can also adversely affect their health. Traditional/conventional farming methods are time-consuming and hard working in nature. Agricultural mechanisation is the process of using equipment and technologies to increase food production and reduce the physical labour. In addition to decreasing drudgery, mechanical power is directly proportional to crop productivity in field work timeliness. Consequently, it is essential to implement farm mechanisation.

Lack of proper agricultural implements at local level and non-

access to equipment during the need of farmers is another reason for getting low production. Generally, small farmers do not have their own agricultural equipment and for this, they must rent it from the prosperous farmers which are available only when the affluent farmers do not need it in their own fields, but there is almost a crop activity in agriculture. So, all the farmers need these at the same time for agricultural operation and if the necessary equipment/machinery is not available at the appropriate time, then the farmers must satisfy with the conclusion of reduction in crop production. Due to this kind of dependence, there is a good impact in agricultural activity and production of crops is affected. Further, due to high cost of equipment, small farmers cannot even purchase it nor it is of value for them under their economic capacity. For this reason, distribution of equipment together

at institutional level and its use can be a good option.

Keeping this in mind, Custom Hiring Centre (CHC) is a facility that houses a range of agricultural machinery and equipment that farmers can rent on a customised basis. Small, marginal and poor farmers will be able to rent farm equipments from CHC at a nominal cost. CHC proves to be a great contribution so that farming can be done on time with technical interventions using minimum human labour.

The establishment of Rural Agricultural Equipment Bank and CHC at community level can be included as a link in these efforts from where agricultural equipment will be available to small farmers on time and at cheap rates. CHC ensures timely access to agricultural implements to poor families and use of these instruments relieves women from difficult labour. Machineries

Table 1. Major roles of the custom hiring centers in the farm mechanisation

Role	Description	Case study evidence in Banka, Bihar
Democratised access to technology	Providing advanced farming methods to all is one of CHCs' main responsibilities. Many small and marginal farmers cannot afford the high cost of contemporary equipment. CHCs close this gap by ensuring that even the most resource-constrained farmers can access the most recent developments in farm mechanisation.	CHCs improved crop yields by about 22% due to timely access to seed drills and harvesters while CHCs facilitated wheat and mustard harvesting reduced manual labour.
Sustainable farming promotion	If farmers have access to modern equipment, they can adopt more sustainable farming practices. Mechanisation has several benefits, such as reduced manual labour, precision farming, and efficient water use, all of which promote sustainable and environmentally friendly agriculture.	CRA-CHCs/NICRA-CHCs increased adoption of zero tillage by about 25% among small farmers.
Addressing labour shortage	In many agricultural districts, there is a severe labour shortage during the busiest farming seasons. By providing tools like planters and harvesters, CHCs can help farmers overcome these challenges and ensure timely planting and harvesting.	CHCs reduced dependency on manual labour by about 15% by providing seed drills and threshers, lowering labour demand.
Economic benefits	For small and marginal farmers, the cost of purchasing, maintaining, and storing equipment may be unaffordable. By employing CHCs, they can significantly reduce their operating costs and increase their profit margins.	CHC users saved 15–20% in operational costs compared to non-users.
Innovation encouragement	As centralised hubs, CHCs can aid in the introduction and promotion of innovative farming tools and techniques. Farmers may test new technologies on a rental basis before evaluating their effectiveness and utility.	Farmers tested tractor mounted Happy seeders through CHCs before adoption, leading to improved crop residue management.
Productivity enhancement	If farmers have timely access to machinery, they can ensure that all of their farming tasks, such as planting, fertilising, and harvesting, are finished as soon as possible. This timely intervention could lead to higher production and better yields.	CHC services improved rice transplanting efficiency and increased yields by 10–12%

क्र.सं.	मशीन का नाम	दर
1	जीसी डिक्शन	1200/ एकड़
2	हॉपी सीडर	1500/ एकड़
3	मल्टी क्रॉप प्लान्टर	1200/ एकड़
4	लीजर लैण्ड प्लान्टर	2000/ एकड़
5	रेज्ड - बीड प्लान्टर	1200/ एकड़
6	रोटरीकटर	1500/ एकड़
7	रीपर	1000/ एकड़
8	रिडर क्लेनर	1650/ एकड़
9	मैटरी ऑपरेटिंग स्प्रेयर	100/ दिन
10	हार्ड-वर्क हो डेक	1000/ एकड़
11	कम्पास हाइड्रोप्लान्टर	2500/ एकड़
12	ट्रैक्टर ट्रेलर	500/ दिन
13	सीडर	100/ दिन
14	प्रीप्लान्ट प्लान/मोडर्न सीडर	100/ दिन
15	ड्रम सीडर	100/ दिन
16	ट्रैक्टर	कार्ड को अनुसार

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Custom Hiring Centre at Upama, Banka

required for operations like sowing, planting, transplanting, plant protection, harvesting and product recovery is highly crop specific. Technological demonstrations have been conducted by Krishi Vigyan Kendra (KVK) Banka in adopted village Upama in which each agricultural machinery was used for every demonstration. The CHC scheme is to create a dimension

of profit through innovation in farming. Under this scheme, farmers can increase ratio of their income by setting up CHC in their village and town. Along with this, bank also provides loans/financial assistance to farmers to set up CHCs. The objective of establishing a CHC is to increase their income by providing the maximum benefits to families associated with agricultural works.

Mr. Rupesh Kumar Choudhary, a progressive farmer of Upama village, has opened a CHC at his farm house in which zero tillage (ZT) machines, seed-cum-ferti drill machine, drum-seeder, tractor, rotavator, reaper, combine harvester, Happy seeder machine, straw beller, Laser land leveler, raised bed planter, knapsack sprayer, rotary mulcher are present. Due to timely availability of agricultural machines, all crops are sown on time to reap benefit in their production. From this, the farmers are getting two-way advantages in form of production potential of crops. First one is that credit goes to timely sowing of crops

and cultivars which is appropriate for obtaining the maximum yield; and second is incorporation of agricultural mechanisation in agronomic practices of the crops.

Operational and logistical lessons

Field implementations of CHCs revealed that successful farm mechanisation depends on strategic placement, training, and digital integration. Key operational lessons include optimising logistics, ensuring financial viability, and addressing equipment mishandling to maximise benefits for smallholder farmers.

Proximity: CHCs must be located within a 5–7 km radius of small and marginal landholdings. This minimises transportation time, reduces fuel costs, and ensures timely field operations.

Demand-driven inventory: Centers should stock machinery aligned with specific local needs. For example, studies in Bihar and neighbouring regions indicated

Table 2. Comparative study of crop yields by establishment CHC in Uprama, Banka

Agricultural implement of CHC	Crops	Cultivars	Average sowing date		Yield (t/ha)		% increase yield
			CHC	Check	CHC	Check	
Happy seeder machine	Wheat	HD-2967	21 Nov.	15 Dec.	4.36	3.46	26.0
Happy seeder machine	Wheat	DBW-187	21 Nov.	15 Dec.	4.54	3.59	26.5
Zero tillage machine	Wheat	HD-2967	21 Nov.	15 Dec.	4.01	3.31	21.15
Zero tillage machine	Wheat	DBW-187	21 Nov.	15 Dec.	4.10	3.40	20.59
Zero tillage machine	Chickpea	PG-186	10 Nov.	30 Nov.	1.04	0.79	24.03
Zero tillage machine	Lentil	IPL-316	10 Nov.	30 Nov.	0.91	0.73	19.78
Raised bed planter	Kharif maize	Acharya	10 July	30 June	6.25	5.22	19.73
Raised bed planter	Rabi maize	Acharya	10 Dec.	20 Dec.	11.06	9.21	20.09
Raised bed planter	Mustard	RH-725	10 Nov.	30 Nov.	1.24	0.89	32.58

a strong need for crop residue management machines like Super seeder and Happy seeder alongside standard transplanter.

Timely maintenance: High maintenance costs and machinery mishandling are major constraints, especially in government-operated CHCs. Establishing dedicated repair protocols and stocking fast-moving spare parts is critical during peak agricultural seasons.

Care and maintenance

The CHC is very effective only when maintenance of agricultural farm machines is fully and disciplined. Cleanliness of machines is very important after using machines. Sometimes, due to excess work, moisture gets absorbed in machines because of remains of manure/seeds. Deposition of seed starts in machine and at same time, manure starts rusting iron in machine. Pressure washing should be done after using the machine for overall cleaning and must be insured that there is not a single drop of water tucked in machine after drying. Finally, machine should be covered with polythene.



Demonstration of CHC machines



Demonstration of CHCs Laser land leveller

Employment generation

In the village ecosystem, CHCs offer a substantial chance for rural entrepreneurship and job creation. Depending on the quantity of machines used, the CHC of Banka district rented machines having between two and twenty employees, including drivers. CHCs have the potential to lower emissions, create jobs, and increase rural incomes. The government must

carry out specific reforms in order to realise this potential, such as introducing an end-of-life machine management plan, training CHCs in business management, and utilising information technology for better tracking and service management.

Challenges in running CHCs

- Damage caused by farmers to the machinery, seasonal demand, payment delays and farmers' ignorance of how to operate the machinery.
- Lack of skilled operators.
- High initial investment, maintenance costs and fuel costs.
- Lack of permanent drivers or workers and low hiring fees.
- Housing issues for equipment.
- Bank loan with a high interest rate.



Problems faced by farmers in CHCs

- Lack of machinery during peak season.
- Lack of skilled labour to operate agricultural machinery.
- Inability to obtain timely information on farm machinery.
- Loss of fodder when the combined harvester is used.
- Lack of knowledge about CHCs.
- Lack of well-maintained machinery.
- Difficulty of transporting agricultural machinery and equipment due to distance between CHCs and the village.
- Lack of skilled and efficient drivers.

- Inappropriate payment methods.
- Poor service, and high hiring charges during peak season.

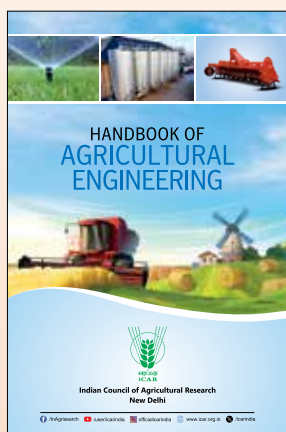
SUMMARY

The establishment of Custom Hiring Centers (CHCs) in Indian agriculture signifies a century-long path towards inclusivity and agricultural mechanisation. In India, CHCs are essential to increasing farm mechanisation and power availability. Programmes like NMAM, NICRA, SMAM, NFSM, RKVY, and MIDH have greatly increased mechanisation, decreased reliance on labour, and improved operational efficiency in a variety of agroclimatic regions. Opportunities

to maximise machinery utilisation, enhance maintenance, and facilitate well-informed decision-making at the field level are presented by real-time monitoring and emerging technologies such as AI and IoT. Even with these developments, problems like scarce machinery, operator skill gaps, high operating costs, and logistical delays still exist. Addressing these issues through training programmes, policy support, and innovative financing mechanisms will ensure long-term sustainability and profitability of CHCs.

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Pages: 1188; Price: ₹ 2000.00, US\$ 300.00; Postage: ₹200

ISBN No.: 978-81-7164-286-1

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