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CUSTOM HIRING CENTRE: AN EMERGING TREND-BENEFITS, CONSTRAINTS AND WAY FORWARD WITH REFERENCE TO NICRA VILLAGE IN WAKHARWAN, DISTRICT PULWAMA

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ABSTRACT

Agriculture in India is undergoing a constant change from manual power of mechanized power. This welcome change reduces the financial implications involved in the maintenance of animals and wanting labor force directly leading to increase in crop productivity, loss of drudgery and smooth crop related operations that too in a time bound framework. Insufficient farm power and machinery available to small and marginal farmers have been always held main hurdles in the way of agricultural productivity. It is a well established fact that the latest available technologies related to farm machinery can be much beneficial to farmers in the various farm related operations, but ironically being costly such machines generally remain out of reach of farmers.Also, due to a high degree of weather aberrations, the timeliness of agricultural operations have come into sharp focus. Use of high capacity and energy farm implements are more important in changing climate scenario. Thus, to make farm machinery available to the marginal and small farmers, joint ownership of such machinery is the most feasible option. Secondly, promotion of Custom Hiring Centers (CHCs) having a large spread in the area is another option. This paper in a brief manner highlights the emerging trend of Custom Hiring Centre in Kashmir region with its pros and cons and the way forward.

KEYWORDS: Climate Change, Custom Hiring Centre, NICRA, Mechanization, Way Forward

INTRODUCTION

Agricultural mechanization is the process of using machines and implements to increase the output in food production and reduce drudgery.The traditional methods of farming are cumbersome and time consuming. Mechanical power is directly proportional to the crop yield in the time bound framework of its various field operations in addition to the decrease in the drudgery.Thus, there is a strong need for taking farm mechanization.

Mechanization in Indian agriculture started with the introduction of the green revolution model, in which establishment of the Central Tractor Organization was established mainly for land reclamation and mechanical cultivation. Since then, by the virtue of its inherent edge over the conventional means of farming, Indian agriculture is undergoing a gradual shift from dependence on human power and animal power to mechanical power. Another reason for this increased dependence on mechanical power is increasing cost for upkeep of animal and growing scarcity of human labour.

As such mechanical power has emerged more economical, indispensable, efficient in utilizing of many natural resources and in realizing of set targets in the scheduled time framework.

Vast cultivation needs mechanization when energy efficient and high capacity farm tools and machines become necessary in changing the climate scenario. Delayed monsoon reduces the sowing period available in the farm community. Besides, a long dry spell between the two rainfalls also delays the completion of various farm operations. It becomes also significant after a prolonged waterlogging period or during various intercultural practices like weeding or harvesting, though for a short period. Farm power has reduced or remained the same during the past 20 years from human/animal resources (0.24kW/ha in 1951 to 0.20kW/ha in 2009) when it has increased 20 fold in the same period when obtained from tractors, mechanical and electrical sources put together (0.04kW/ha in 1950 to 0.93kW/ha in 2009) (Srinivasarao*et al* 2013).

The state of Punjab is the highest use of mechanical power in the order of 3.5 kW/ha whereas its distribution is uneven across the other states and is less than 1 kW/ha in the states of Bihar, Jharkand and Orissa etc. Mechanical power is consumed by the farmers having large land holdings when it is still a distant dream for small and marginal farmers who constitute 80 per cent of the total land holdings otherwise. But unfortunately having a poor financial stand the marginal and small farmers are not able either to own such farm machinery or through some credit facility institution.

In Punjab, out of 10 lakh land holdings, about three lakh are small and marginal holdings. Interestingly, the number of these holdings has declined during last one and half decade. It was five lakh in 1991 which declined to three lakh in 2005-06. This shows that two lakh small farmers have left farming, the majority of them has left agriculture due to uneconomical size of holdings (Singh and Kingra, 2007; 2010). The largest number of old tractor markets are a common site in the state. Some small farmers even buy a new tractor from the agency to sell them in these tractor markets, to repay any other debt (Singh and Rangi, 2006). The annual hours of tractor/machinery used in small holding do not justify the ownership of tractors and tractor-based machines by most of the farmers. It is always argued that tractor and other implements are the major reason of farmers' distress. The small farmers who have owned their tractor are more indebted than the other farmers who hire-in tractor and other machinery. Through custom hiring of agricultural machinery, even small farmers have been able to get the benefit of agricultural mechanization (Singh *et al*, 2013). To make farm machinery within the reach of marginal/small farmers, promotion of CHC is required to be promoted in a big way for their collective ownership.

STATUS OF MECHANIZATION IN KASHMIR

The average size of operating land holding in J&K is 0.66 ha, which is half than average operated holding size in India (Table 1). The fragmentation of land holding is expected to be greater, especially under small and marginal farmers' categories in the State. The majority of the farmers (78%) in the State is marginal having less than 1 ha land holding. (Dixit *et al*, 2014).

Table 1: Operational Land Holding Pattern by Major Size Groups in the Region

Class	Size of Land Holding, Ha	No. of Operational Holding, In '000		% Distribution		Av. Size of Operational Holding, Ha	
		J&K	India	J&K	India	J&K	India
Marginal	<1	1041	56748	77.9	58.07	-	0.38
Small	1-2	186	17881	13.93	18.29	-	1.43
Semi-medium	2-4	89	13254	6.67	13.56	-	2.76
Medium	4-10	18	7920	1.35	8.10	-	5.94
Large	>10	1	1925	0.07	1.97	-	17.20
Total		**1335**	**97728**	**100**	**100**	**0.66**	**1.68**

Source: Digest of statics of Jammu and Kashmir (2006-07) and Statistical Abstract India (1990).

The small land holding, undulating topography, terraced irregular shape fields, and low investment capacity of farmers makes the mechanization difficult with farm equipment available in the market. The traditional tools and implements are still in use by farmers. There are no specialized markets for the production and marketing of farm implements in the State, except some manufacturing and marketing units in Jammu. One of the parameters for expressing the level of mechanization is the availability of farm power per unit area (kW/ha). Farm machinery use depends upon the farm power available for various traction and stationary operations. At present, the availability of farm power is 0.78 kW/ha in the State (gross cropped area basis) whereas the National average (projection) is 1.502 kW/ha. There is great variability in unit farm power availability within State i.e. it is as high as 3.06 kW/ha in RS Pura&Bishna and as low as 0.47 kW/ha in Ramnagar areas of Jammu region of the State (Sharma, 2009; Sharma, 2010).

Draught animals continue to provide major tractive power for field operations in the State. Animate power (draught animals and human power) and mechanical power contributed 51.2% and 38.4% of the total farm power respectively during 2005-06 (Figure 1). It indicates that animate power still plays a major role in sources of farm power. The availability of farm power in the State is very low and has much need for further mechanization.

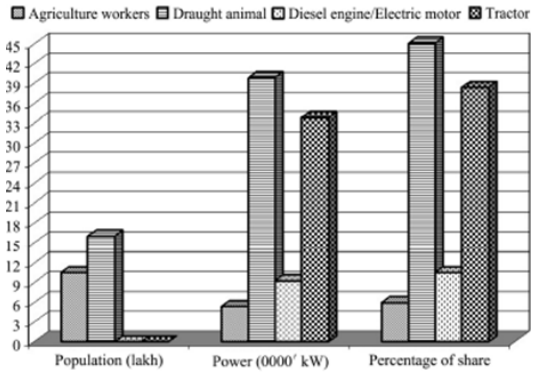

Figure 1: Population of Farm Power Sources and their Power Availability in J&K

The State possesses a huge potentiality to adopt selective mechanization rather than sweeping mechanization. The farmers face difficulties in timely completion of field operations due to lack of mechanization inputs like to improve implements for tillage operation, puddling, sowing/planting, interculturing, irrigation equipment, plant protection, harvesting, threshing, drying and processing equipment.

The application of mechanization technology would increase agricultural productivity. Consequently, labor tied up with manual farm operations would be released to higher value activities. Rice-wheat cropping system has potential to provide food and feed security in the State hence priorities should be given to these crops by adopting improved varieties along with mechanization inputs for timely and efficient operation. (Dixit *et al*, 2014).

The farm power availability at 0.78 kW/ha (gross cropped area basis) has potential to increase, as it is much lower than the national average of 1.502 kW/ha. There is tremendous need for the mechanical and electrical power sources and their matching implements to increase the cropping intensity. For stationery operations like water lifting, threshing, chaff cutting, cleaning, grading and other agro processing activities, adequate electrical energy is essential. In all the three regions of the State, animal power utilization is only 250-300 h annually (as against ideal utilization of 2,500 h). Most of the time the draught animals remain idle due to a limited period of use for tillage, sowing and puddling operations only. Farmers have to spend the money on the maintenance of draught animals for the entire year. Thus, the animal power is wasted without its optimum utilization. However, it is not possible to replace completely the animal power with the mechanical power. Besides, the State has a great number of draught animals (15.96 lakh). To maintain an eco-friendly system, there is a need to select, test and popularize animal drawn improved implements of tillage, sowing, puddling and intercultural operations. This will increase the efficiency of animal and reduce the drudgery of the farmers. In addition, the ideal period of draught animals can be utilized for the generation of electricity through rotary mode of operation. In the hilly areas of the State, power tiller matching implements for seedbed preparation, sowing, plant protection, harvesting, threshing etc. are relevant to small, irregular and undulated fields and could be introduced. Moreover, better performance of the existing farms would be gotten through timeliness of operations and minimizing of avoidable losses that occur during harvest and post harvest operations. Improved harvesting equipment like serrated sickles, fruit pickers, vertical conveyer reapers and mini combine harvester could be introduced. To overcome the drudgery in threshing and cleaning of cereals, pulses and oilseeds, appropriate power threshers could be adapted. Seasonal leafy vegetables and fruits like apple, pear, cherry, strawberry, almond, walnut, saffron and kale-zero (black zebra) could be used for value addition. This will be helpful in reducing the supply –demand deficit in off-season. Fruit crop mechanization equipment for pit making, transplanting of saplings, pruning, spraying in tall crops, harvesting of fruits, etc. could be identified/ adopted/ developed and popularized. (Dixit *et al*, 2014).

THE IDEA OF CUSTOM HIRING CENTRE

Custom hiring of farm machines was first introduced in Indian agriculture early decades of the 19th century, when a 30-inch (diameter) steam thresher was used for custom hiring. The machines were taken about 10 different places working for 2 or 3 days in each place. Agro-Industries Corporation (AIC) was established in the states in mid 1960 only after the organized Custom Hiring was introduced to promote multiform use of agricultural machinery. These centers were run on no profit no loss basis. From 1967, these centers also supplied pump sets, tractors, power threshers and power tiller on hire purchase basis rather than on Custom Hiring. AICs in 1970s to 1990s, concentrated mainly on land development and tillage operation aspects and had not spread to other important field operations. These countries suffered huge losses on account of the difficulties involved in the recovery of loans from the farmers.

The AICs had to curtail this project and finally these centers were closed. In the meantime, private entrepreneurs entered the field of custom operations of farm equipment. Owners of tractors and threshers started providing custom service to other fellow farmers for tillage, threshing, transport, etc. This brought additional income to custom operators and gave access to mechanization for all groups of farmers irrespective of the size of their holdings.Custom hiring of farm implements got a further boost when Government of India, in 1971, launched a scheme to set up agro-service centers all over the country. Custom hiring services, in a limited way were started in 1990s under National Schemes spread over India, under NATP and NAIP in a limited way. Accordingly, it had limited success because they were tried in limited spaces with extremely less number of staff i.e. concentrated in small pockets of India. (Srinivasarao*et al* 2013).

Recently in 2010, the National Initiative on Climate Resilient Agriculture (NICRA) Project launched by Indian Council of Agricultural Research (ICAR) started a trend to popularize custom hiring services in 100 KVKs spread over drought/flood/ hill area and other difficult situations of agriculture. One representative village or a cluster of villages from each of the 100 identified vulnerable districts was selected for this purpose by the respective Krishi Vigyan Kendra (KVK), in the district. In Kashmir Valley, a Wakharwan village in Pulwama district under KVK Pulwama was chosen for this purpose.

The biggest advantage with the present, launch of custom hiring services is that:

- Available extension network and technical expertise of KVKs are utilized, that act as a backstop.
- By forming Farm machinery Service Centers/Farmers Committee, requirement of individual village/agro-climatic zone is assessed and use of equipment is tailor made as per requirement/demand.
- Revenue generation is plagued back to the society.
- Operation, repair, maintenance aspects is taken care of. (Srinivasarao*et al* 2013).

SETTING UP OF CUSTOM HIRING CENTRE UNDER NICRA IN WAKHERWAN

Due to a high degree of weather aberrations, the timeliness of agricultural operations have come into sharp focus. Use of high capacity and energy farm implements are more important in changing climate scenario. It is seen that the ideal conditions for various agricultural operations like sowing or interculture exist for a short period of time. If the farmer does not complete the operation within that specific time, he will have to compromise with the output. Farm machinery can enhance the efficiency and timeliness of various agricultural operations even on small farms. But the cost of such machinery is quite high which a small or marginal farmer cannot afford.This calls for sharing of the cost of implements by innovative institutional arrangements. In the recent past, custom hiring of agricultural machinery has been seen as an appropriate institutional arrangement which can promote mechanization of agricultural operations on small farms.

For the first time, an attempt has been made by the National Initiative on Climate Resilient Agriculture (NICRA) to set up one custom hiring center in 100 climatically vulnerable villages across the country. One such Custom Hiring Centre has been set up in the NICRA adopted village at Wakharwan, District Pulwama. This village is at a distance of 8km from the Krishi Vigyan Kendra of District Pulwama.The village represents the dominant cropping system of the district. A higher proportion of the farmers are small and marginal farmers with the majority of the families in the selected village deriving the major portion of their family income from agriculture and allied activities. The climatic vulnerability of the

village (frequency and intensity of droughts, floods, heat wave, cold wave, etc.) represents that of the district.

The custom hiring center at Wakharwan is stocked with machineries/equipments likewater pumps, power sprayer, power tillers and tractors, etc. that help the farmers in carrying out timely operations and help overcome climatic vulnerabilities.

Labor shortage at peak times of demand is a serious problem faced by farmers.Soil health and resource conservation technologies are generally linked to timely access to proper farm machinery at a reasonable cost can be improved by the adoption of climate resilient practices like soil incorporation of legume catch crop and crop residues. Water pump provided in the CHC has helped the farmers meet the irrigation requirements during drought periods. The power sprayer has helped farmers in timely spraying of pesticides/insecticides in their fields, which otherwise take days to complete causing delay in the prescribed spray schedule.Similarly, the tractor and trailer have also proved beneficial to the farmers.

A committee of farmers' manages the custom hiring center. TheratesforhiringthemachinesimplementaredecidedbytheVillageClimateRisk Management Committee(VCRMC).The funds generated by this committee out of the hiring charges are used for repairs and maintenance of the implements and the balance amount is kept as revolving fund. A bank account is opened in the name of VCRMC and is operated by two signatories. Farmers' contributory share towards inputs like seeds, fertilizer, animals, etc., is also deposited in the bank account.

Figure 2: Custom Hiring Centre at NICRA Village under KVK Pulwama

So far the CHC has been able to generate an income of Rs 7000 this year. Though the Custom Hiring Centre is in its initial stage and has been set up recently in the village, it has proved advantageous for the small and marginal farmer.

The custom hiring center has many advantages when it is well equipped with all the necessary equipments/machineries that are location and crop specific. Thereisaneedforpositioninga multiple numberofother equipmentslikeplanters,zerotilldrills, harrows, power wielders, seed cum fertilizer drills, drip and sprinkler sets, different kinds of crop threshers etc.

In the custom hiring controls to mitigate the climatic vagaries and help the farmers adapt to the changing climate.

Benefits of Custom Hiring

Promotion of Custom Hiring services has the following benefits:

- Provides access to small and marginal farmers to costly farm machinery.
- Facilitates timeliness in farm operations and efficient use of inputs.
- Promotes adoption of climate resilient practices and technologies by farmers because of the availability of appropriate machines at reasonable hiring charges.

In addition to the above Custom Hiring services have the following economic, social and environmental benefits:

Economic and Social Impacts

- Efficient labor,
- Reduction in cost of production,
- Improved cultivation area,
- Timely production,
- Increased quality cultivation,
- Increased yields,
- Crop diversification,
- Reduction of harvest and post-harvest losses,
- Surplus income through hiring farm-power services to others,
- Reduction of drudgery and workloads particularly for women,
- Improved safety,
- Retention of farmers in rural areas along with improved livelihood

Environmental Benefits

- Use of water conservation technologies such as laser leveling,
- Use of baler instead of burning crop residues.
- Also, as in case of Zero Tillage (ZT) allows direct planting of wheat without plowing, sowing seeds directly into residues of the previous crop on the soil surface, thus saving irrigation water, increasing soil organic matter and suppressing weeds.

Constraints in Strengthening of CHC's

Custom Hiring envisages promoting the establishment of farm machinery, banks for hiring by way of providing financial assistance to self help groups and co-operative societies as the initial cost of such hi-tech and high productive implements is too high to be borne by a single individual. As against this, CHCs can offersuch expensive farm machinery on rental basis to the needy farmers in addition to the servicing of old machinery. To improve the quality of agricultural operations, CHCs play a significant role in introducing the high technology, agriculture implements and machinery, even to ordinary farmers who otherwise can't afford to purchase them with the sole objective to boost and improve crop production and the quality of agriculture operations respectively. (Food and Agri Strategic Advisory and Research (FASAR)*et al*, 2016)

Due to India's archaic Land Ceiling Act, the total land under agriculture for an average Indian farmer is shrinking, which is a mere 1.5 acre per farmer at present. With such small land holdings, a farmer faces difficulty in justifying ownership of any kind of Agri-machinery. Hence, renting out farm machines becomes more viable. Out of 120 million strong farmer population in India, the majority of them are incapable of buying machines. Moreover, the growing reality of labor shortage is making farmers more inclined towards mechanization to ensure faster work at a lower cost.

There are certain constraints that come with the setting up a CHC. The major constraints in Custom Hiring of improved machinery are following:

- High initial cost often prohibits individual ownership, especially for small and medium farm holds.
- Lack of knowledge in the aspects of operation, maintenance and repair of equipment restricts the use of farm machinery.
- Repair and maintenance under individual ownership coupled with lack of space for shelter also constraints the use.
- Tractorization being the prime mover in India, farm mechanization is more oriented towards the use of tractors and allied equipments.
- Sub-optimal asset capacity utilization on account of crop specific requirements and uniform spread of Custom Hiring to all the farmers who need it.
- Lack of awareness amongst farmers on the merits of Custom Hiring. (FASAR*et al*, 2016).

Government Schemes to Support CHCs

National Mission on Agricultural Mechanization (NMAM)

As an integral component of the effort of Department of Agriculture, Cooperative and Farmers Welfare to restructure and streamline all Agriculture Development Schemes in the 12th plan, it was envisaged to have one integrated national mission on agricultural mechanization that would aim at catalyzing an accelerated but inclusive growth of agricultural mechanization in India. The mission provisions for continuation of following three ongoing 11th plan interventions which include:

- Promote and strengthenthe mechanization of agriculture by imparting training, testing and demonstration.
- Post harvest technology and management.
- Financial assistance or procurement subsidy for agricultural machinery and equipments.

Besides, NMAM proposed to include the following additional interventions that are already identified under the Mission document on the National Mission for Sustainable Agriculture (NMSA):

- Establishment of farm machinery, banks for Custom Hiring
- Establishing Hi-Tech, High Productive Equipment Centers
- Enhance farm productivity by introducing appropriate farm mechanization in selected villages
- Creating ownership of appropriate farm equipment among small/marginal farmers in eastern/north eastern region

The proposed outlay for this mission during 12th plan shall be 3500 crores. (FASAR*et al*, 2016).

Submission on Agricultural Mechanization (SMAM)

SMAM scheme will be implemented in all the states, to promote the usage of farm mechanization and increase the ratio of farm power inthe cultivable unit area up to 2 kW/ha. The mission comes under theambit of National Mission on Agricultural Extension & Technology.

The mission endeavors to fulfill the following objectives:

- Increase the reach of farm mechanization to small and marginal farmers and to the regions where the availability of farm power is low, especially in Eastern and North Eastern regions.
- Promote CHC for agricultural machinery by offsetting adverse economies of scale and higher cost of ownership of high value farm equipment.
- To share the benefits of hi-tech, high value and high-productive agricultural machinery to farmers by creating hubs for such farm equipment.
- By demonstration and capacity building activities, promote farm mechanization and awareness among stakeholders.
- To ensure quality control of newly developed agricultural machinery and to certify them at the designated testing centers located all over the country through performance evaluation of newly developed agricultural machinery and equipment. (FASAR*et al*, 2016).

Themission would have following eight components:

- **To Promote and Strengthen the Mechanization of Agriculture by Imparting Training, Testing and Demonstration:**This segment aims to boost the performance testing of agricultural machinery and equipment, capacity building of farmers and end users and to promotefarming mechanization employing demonstration methods.

- **Demonstrate,Train and Distribute Post Harvest Technology and Management (PHTM):**The aim of this segment is to popularize the technology for value addition, low cost scientific storage/transport,primary processing, and crop by-product management employing demonstrations, capacity building of farmers/end users. Besides, provide financial assistance to establish PHT units.
- **To Provide Financial Assistance for the Procurement of Agriculture Machinery and Equipment:** This segment shall promote ownership of various agricultural machinery & equipments as per laid down norms.
- **To Establish Farm Machinery Banks for Custom Hiring:** This segment shall provide reasonable financial assistance in establishing farm machinery, banks for Custom Hiring for appropriate locations and crops. (Table 2)
- **To Establish Hi-Tech, High Productive Equipment Hub for Custom Hiring:**Under this segment necessary financial assistance shall be provided to set up hi-tech machinery hubs for high value crops like sugarcane, cotton etc. (Table 3)
- **Farm Mechanization Promotion in Selected Villages:**Under this segment financial assistance is provided to give boost to relevant technologies in order to set up farm machinery banks in low mechanized states in identifying villages.
- **To Promote Mechanized Operations/Hectare Through CHCs By Providing Financial Assistance:** This covers low mechanized areas where financial assistance is provided to the beneficiaries on per hectare basis for hiring machinery/equipments from custom hiring centers(Table 4).
- **North-Eastern Region and the Promotion of Farm Machinery and Equipment:**Under this segment financial assistance is extended to the states of north-east, poor in mechanization among the beneficiaries having high potential.(FASAR*et al*, 2016).

Table 2: Cost Norms and Pattern of Financial Assistance for Establishing Farm Machinery Banks for Custom Hiring

Item	Maximum Permissible Project Cost	Pattern of Assistance
Procurement Subsidy for Establishment of Custom Hiring Centre up to 10 lakh	Rs 4 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre up to 25 lakh	Rs 10 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre up to 40 lakh	Rs 16 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre up to 60 lakh	Rs 24 lakh	40%

Source: Ministry of Agriculture, Government of India

Table 3: Cost Norms and Pattern of Financial Assistance for Establishing Hi-Tech, High Productive Equipment Hub for Custom Hiring

Item	Maximum Permissible Project Cost	Pattern of Assistance
Procurement Subsidy for Establishment of Custom Hiring Centre up to 100 lakh	Rs 40 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre up to 150 lakh	Rs 60 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre up to 200 lakh	Rs80 lakh	40%
Procurement Subsidy for Establishment of Custom Hiring Centre upto250 lakh	Rs100 lakh	40%

Source: Ministry of Agriculture, Government of India

Table 4: Cost Norms and Pattern of Financial Assistance for Promoting Mechanized Operations/Hectare Carried Out Through CHCs

Sr.No	Item	Maximum Permissible Project Cost	Pattern of Assistance
1	(a) Hiring Charges to former members of Farm Machinery Banks set up under the component (6)	Rs 2000/ha/farmer/year	50% of the cost of operation/ha
2	(b) Field Demo by CHCs	Minimum 120/ha/season per CHC	Rs 4000/ha

Source: Ministry of Agriculture, Government of India

Way Forward

Promotion of the concept of organized Custom Hiring through farm service centers is the potential channel to address its constraints. A vast area still remains uncovered, although line departments, primary agricultural credit societies, multipurpose and marketing societies have extended machinery for Custom Hiring. Besides, informal hiring systems are also in service in rural areas, yet their timely availability is not assured. As such need is felt to encourage progressive farmers, Agri-graduates, rural unemployed youth, etc. coupled with water Users Association, SHG Federations, Watershed Committee and such class of societies at village level to set up Custom Hiring Centers.

The key interventions required across the value chain to enable the widespread adoption of this CHCs are:

- With increased participation of stakeholders across the Agri supply chain and handholding farmers by supplying all equipments for the entire life cycle of a crop sequentially, Custom Hiring concept can be made successful.
- The partnership is crucial for any company to enter into Custom Hiring space. Concept of Custom Hiring holds good potential provided there is an integration of all the operations via provision of Agri inputs like seeds, fertilizers, implements etc. through partnerships with various companies.
- There is a need for incentives and policy support for the adoption, development and promotion of farm mechanization technologies, particularly suitable for dry land farming, horticulture and orchards, hill agriculture,

sugarcane harvesting, cotton picking, rice production etc.

- Commercial banks and financial institutions need to develop hassle free loan origination and disbursement process for tractors and farm machinery on the individual ownership basis or Custom Hiring basis. To increase the interest of banks to lend in this sector a higher rate of refinances is required to be extended to loans lent by the banks in the locations with low mechanization.
- Training and farmer workshops to show and identify the benefits of new technologies as well as intensive communication with the value chain is the key. The standardization of growing only happens once the results are proven to be more efficient and consistent.
- KVKs and extension wings of universities need to play a very key role in sensitizing the farmers on Custom Hiring adoption.
- Manufacturing units that are set-up in areas with lower mechanization needs to be supported by extending tax and duty sops. This would result in easier reach of the equipment to farmers in those areas. Simultaneously the government needs to design easier financing schemes for such farmers.
- Combined harvesters which are capital intensive are the potential components for Custom Hiring. 90% of these machines are owned by non-farmers which are predominantly transported operators which can be encouraged to promote Custom Hiring.
- There is a need to innovate Custom Hiring model by institutionalization for high cost farm machinery such as combine harvesters, sugarcane harvester, potato combine, paddy transplanter, laser guided landleveler, rotavator etc.
- Indigenization of many specialized machineries by the private players which are otherwise importedthereby bringing down the cost.
- Promotion of the formation of farm cooperatives, including FPOs which eventually increases the scope of use of bigger farm machinery and result in minimum wastage of resources.
- Improvement in irrigation facilities will enable the farmer to go for multiple cropping and hence there will be need of more machines. (FASAR *et al*, 2016).

CONCLUSIONS

The concept of custom hiring has potential provided there is integration of all operations viz. agri inputs like fertilizers, equipment and seeds through various partners in the ecosystem. The true potential and effectiveness of Custom Hiring can be witnessed by implementing proper policy, support for adoption, development and promotion of technologies associated with the farm mechanization by imparting training, use of ICT and demonstration.

In India small and marginal holdings constitute 80 percent of total land holdings. Thus to cater for such vast area a tremendous potential for CHCs is visible to meet the requirement of farm machinery. Recognizing such huge potential the Government of India had envisaged increase of farm power availability in the 12th Plan period (2012-2017) from the present level of 0.93kW/ha to 2kW/ha. “Submission on Agricultural Mechanization (SMAM)” is one such initiative

towards achieving this objective. Custom hiring facilities for agricultural machinery is one of the major components of this mission. The states of Andhra Pradesh, Madhya Pradesh, Karnataka and Punjab have introduced Public Private Partnership (PPP) to promote Custom Hiring by offering training, financial assistance and demonstration.

As majority of Indian farmers belong to small and marginal category, purchase of farm equipment is a significant investment for them. Reasonable financing norms are a must for making farm equipments and machineries available at affordable price and enhance farm mechanization. An issue that has been persistent in financing is the purchase of standalone implements. This adds to the "tractor-isation" trend that is visible in the industry and doesn't add to overall mechanization. Industry stakeholders feel that commercial banks must be encouraged to provide adequate financing various farm equipments. This is seen by many industry sources as the biggest impediment to growth. Banks can finance the custom service units managed by individuals, institutions or organizations who maintain a fleet of tractors, bulldozers, well-boring equipment,threshers, combines, etc., and undertake farm work for farmers on contract basis, under Priority Sector Lending (PSL) policy of Reserve Bank of India (RBI).

Custom Hiring in India faces constraints like high initial cost of equipments, lack of knowledge in the aspects of operation, maintenance and repair of equipment, repair and maintenance under individual ownership coupled with lack of space for shelter, orientation towards the use of tractors and allied equipments, suboptimalasset capacity utilization on account of crop specific requirements. To overcome this, virtual or real consolidation of the widely fragmented and scattered land holdings in many parts of the country, extension of benefits of mechanization to all cropping systems, including horticultural crops, enhancement of the average farm power availability to minimum 2.5 kW/ha to assure timeliness and quality in field operations and use of precision and efficient equipments to improve the quality of operations is required.

The Custom Hiring model holds the potential to be the best way to introduce capital intensive, high quality and efficient farm mechanization to the small farming structures prevalent in India. The Custom Hiringmodel enables new machines to be used at their maximum capacity and enables farmers to gain access to latest technology they would otherwise not be able to afford. Custom Hiring can significantly facilitate diversification in agriculture, specifically from wheat and paddy to other crops. However, Custom Hiringthrough private entrepreneurs or co-operatives will help to increase the annual use of these equipmentsthereby making them viable.

Custom Hiring is the evolving concept in India and holds an immense potential to change the farm mechanization landscape of India. With increased participation of stakeholders across the Agri supply chain and handholding farmers by supplying all equipments for the entire life cycle of a crop sequentially, CustomHiring concept can be successful. There is a need to study and replicate successful business models along with incentivisation and policy support for the adoption, capacity building and skill enhancement,development and promotion of farm mechanization technologies. Innovation in Custom Hiring model byinstitutionalization for high cost farm machinery such as combine harvesters, sugarcane harvester, potatocombine, paddy transplanter, laser guided land leveler, rotavator etc. is critical.

Until concrete steps are taken to induce farmers to adopt efficient farm mechanization practices it will remain at the bottom line of the pyramid, though it has made a visible impact in some states of our country. The Custom Hiring is the only practical way to introduce capital intensive, high quality mechanization to the small farming structures prevalent in India.

The Custom Hiring model enables new machines to be used at their maximum capacity and enables farmers to gain access to technology they would otherwise not able to afford.

Custom Hiring can significantly facilitate diversification in agriculture, specifically from wheat and paddy to other crops. Machinery required for operations like sowing, planting, transplanting, plant protection,harvesting and product recovery is highly crop specific. Thus, diversification would require the use of a vast variety of additional equipment for these operations on limited area in the initial stages, making it highly uneconomical on ownership basis. However, Custom Hiring through private entrepreneurs or co-operatives will help to increase the annual use of these equipments thereby making them viable.

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