

Promoting Custom Hiring of Agricultural Machines for Climate Resilient Agriculture in Myanmar's Dry Zone

fact sheet

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Key Points

- Custom hiring is a useful approach to addressing labour scarcity, extreme and harsh climatic events, shorter time windows for completing critical agricultural activities, and the lack of financial resources and necessary technical skills to purchase and operate required machinery.
- Greater information dissemination and enhanced awareness among stakeholders can increase the popularity and adoption of custom hiring.
- Appropriate training for personnel involved in machine operation, and repair and maintenance services, is required.
- Increased investment in rural infrastructure including roads, rural electrification, rural microfinance, and banking, can provide an impetus for custom hiring of agricultural machinery in the Dry Zone.

1. Introduction

Agriculture in Myanmar can be characterized as smallholder agriculture, with approximately 3.6 million hectares of agricultural land cultivated by small-scale farmers. Farmers need to increase the cropping intensity in order to increase production; agricultural mechanization development is an essential tool for this. It is estimated that the country has approximately 14,300 large tractors (over 50 hp), 2,400 medium tractors (under 50 hp), 300,000 power tillers and 1,700 combine harvesters in use.

Climate and environmental stress are among the main drivers of migration of farmers for employment, thereby reducing the availability of younger farmers during peak agricultural seasons. Custom hiring of agricultural machinery is a useful approach to enabling farmers in the Central Dry Zone (CDZ) to cope with labour scarcity, extreme and harsh climatic events, shorter time windows for completing critical agricultural activities, and the lack of financial resources and necessary technical skills to purchase and operate the required machinery.

There are two kinds of farming systems popularly practised in the CDZ: rice farming and upland field-crop farming systems. Rice farmers depend on custom hiring mainly for land preparation, irrigation and harvesting activities, whereas farmers in the upland field-crop growing areas use custom hiring only for land preparation activities, especially for ploughing and harrowing. Irrespective of the farm size (small or medium) or the farming system (rice based or upland field-crop based), farmers commonly utilize custom-hiring services. However, the type of machines hired greatly varies with the farm size as well as the farming system. While both small and medium farms tend to use custom hiring equally, the difference is in their motivation to do so. The small-scale farmers need to use custom hiring as they do not own the machinery; and the medium-scale farmers need custom hiring as they cannot afford the required machinery for their own capacity (along with whatever small machines they own) during the peak season, for example, in the period between the harvesting of the first crop and land preparation for the second crop.

CSAM

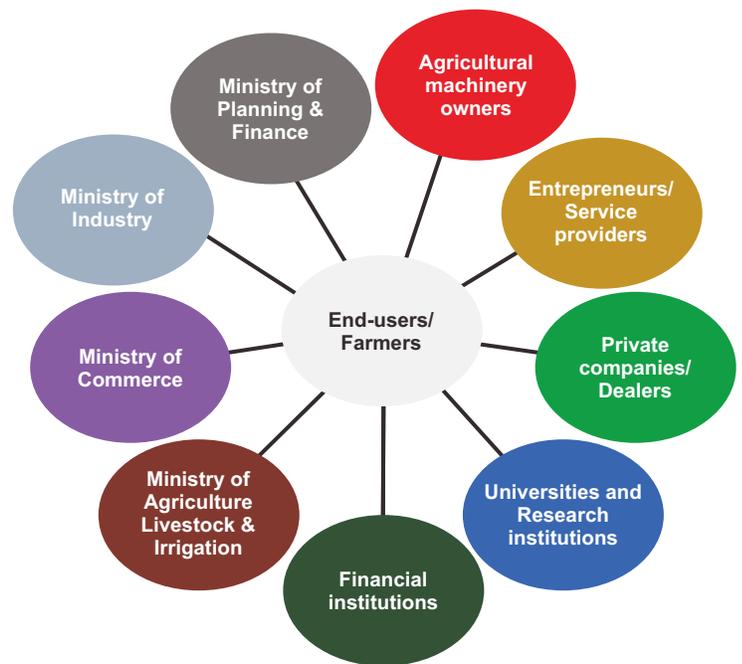
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There are important differences in the availability of custom-hiring services between rain-fed and irrigated areas. In villages where farms have access to irrigation water for agricultural purposes, they can successfully (and somewhat more economically) manage their crops, as well as have access to adequate custom-hiring services/options. However, in villages where agriculture (especially upland field-crops) depends on rainfall, only a limited number of custom-hiring services/options are available to farmers. Moreover, migration is higher in villages with rain-fed farming and the need for machinery is also higher to substitute mechanical power for human power.

Key stakeholders

Major hiring service providers in the CDZ are (i) government departments (largely providing machinery for land preparation, tillage and irrigation); (ii) rich or large-scale farmers (largely providing machinery for land preparation); and (iii) private companies (largely offering their services for harvesting activities). In general, the practice of custom hiring of agricultural machinery is complex and site specific. Ten key stakeholders whose work both affects and is affected by the end users of custom-hiring services (i.e. farmers) can be identified, as shown in Figure 1.

Figure 1. Key stakeholders map



User preferences

Users of agricultural machinery have contrasting criteria for selecting machines for purchase for self-use. For instance, power-tiller customers prefer brands that are relatively inexpensive, are supported by local repair/spare-parts shops and distributed by local manufacturers/dealers. Buyers of four-wheeled tractors and combine harvesters prefer the brands that are more established and considered reliable – even though they are relatively more expensive than other brands. In contrast, farmers who use custom hiring services, do not have much choice of custom-hiring service provider. In several cases, the selection is based on the skill level of the operator, and not on the brand, model or age of the machine itself.

Farmers in CDZ are not well informed on options for financial assistance. In general, buying machines on instalment is directly negotiated with machinery dealers. At times, the processes (both information and documentation related) of availing financial assistance are not clearly understood by customers and they tend to prefer a source of finance that processes their loans quickly – even if this means compromising on interest rate. In other words, the ease of obtaining the loan and quick processing are decisive criteria for many customers when selecting an appropriate source of finance. Mostly, farmers prefer financial services offered by private banks, which are directly linked to the machinery dealers/companies. These banks often claim to process the loan in as little as a day, and have very few documentation requirements. However, the interest rates charged by these sources are significantly higher than those charged by government financing sources.

Strengths, weaknesses, opportunities and threats (SWOT) analysis of custom-hiring services in the Dry Zone

INTERNAL FACTORS				
	STRENGTHS	Concerned stakeholder	WEAKNESS/CONSTRAINTS	Concerned stakeholder
1	Platform and network is in place for manufacturing of basic agricultural machines, and procurement (import)	G	Available platform and network for custom hiring is quite basic and does not meet the growing needs of the Dry Zone	G
2	Test protocols (basic tests) and test facilities to evaluate basic machines also in place	G	Inadequate extension support to address specific issues of custom hiring (for both service providers and end users)	G
3	Existing network for distribution of agricultural machinery	G	Lack of local manufacturing capacity for advanced agricultural machines, especially combine harvesters and tractors	P, U, G
4	Custom hiring of agricultural machinery is usually welcomed by farmers in the region	O, E, P, f	Limited and weak dealership network	P
5	The Dry Zone has relatively less heterogeneity/diversity in cropping systems	O, E, P, f	Repair and maintenance are not organized/coordinated by service providers	P
6	At least basic irrigation facilities (pumps) have been made available over a sizeable area	G, f, O	Mostly farmers get information informally and make decisions about custom hiring from their neighbours' experiences; they do not have a clear idea of the economics of custom hiring	f, G, E, P
7	Local workshops are commonly available and have basic technical skills and equipment, which can be upgraded and utilized for maintaining agricultural machines	E, P	Small and fragmented holdings increase the set-up costs for service providers	O, E, P, f
8			Poor infrastructure (such as paved roads, electricity, fuelling stations, etc.) makes the movement of heavy machinery difficult	G, O, E, P
9			Lack of agricultural engineering/farm mechanization related institutes of higher learning (universities, vocational courses) in the Dry Zone	G, U
10			Lack of strong network of academia, R&D institutions and manufacturers for human resources development, R&D and extension	G, U, P
11			Poor liaison with industries/agricultural machinery manufacturers for R&D and commercialization	G, U, P, C
12			Trained personnel for R&D in agricultural engineering are limited	G, U
13			Poor quality of machines being rotated for custom hiring	G, P, C, f
14			Almost no formal feedback/knowledge-sharing system on collecting/reviewing experiences of service providers and users on custom hiring	G, P, E, f
15			Lack of standardization and quality control of agricultural machinery	G, C, P, E

O: Agricultural machinery owners
E: Entrepreneurs/service providers

P: Private companies/dealers
U: Universities and research institutions

C: Finance/credit institutions
G: Ministries/government departments

f: End users/
farmers

EXTERNAL FACTORS				
	OPPORTUNITIES	Concerned stakeholder	THREATS	Concerned stakeholder
1	The available basic platform of custom-hiring services has ample scope for upgrading (infrastructure, capacity-building, technology advancement, etc.) and eventually expansion of its services	G	Farmers may be overexploited in the absence of government-led regulatory/guiding mechanisms, or in case of low levels of market competition (too few service providers) for custom-hiring options	G, f
2	Farmers in the Dry Zone seem to be convinced/aware of benefits of custom hiring; extension services may tap this opportunity to accelerate this initial momentum	G	If not managed well, the custom-hiring service providers may dominate in farming decisions (e.g. crop type or variety selection, calendar, agricultural practices, farm management, etc.) – to suit the machinery they have to offer for custom hiring	G, f
3	Increasing number of service providers may help introduce new designs of machines from a variety of manufacturers; thereby increasing competition – which is healthy for the marketplace	O, E, P, C	Farmers may overlook the potential benefits of custom hiring in the absence of frequent/adequate extension counselling; Similarly, the service providers may sometimes knowingly or unknowingly promote wrong/unsuitable agricultural machinery, leading to loss of operational efficiency and environment damage	G, U, f
4	Increasing trend of urbanization favours custom hiring; in future, it is likely that mainly older and women farmers will be available to manage their farms, which favours custom hiring for almost all major agricultural activities	O, E, P, C, f	Slow replacement of machinery, in an imperfect marketplace for farmers (too few service providers), may lead to unsustainability in the production system	G, C, P
5	With projected mechanization of the entire value chain, custom hiring may go much beyond the current selected agricultural operations; it could lead to the establishment of a well-coordinated value chain for commercial supply, transport and marketing of agricultural produce	O, E, P, U, f	In the absence of local manufacturing, the service providers and farmers may be inclined to use substandard and inefficient machinery	G, P, C
6	The Dry Zone may observe increased demand for custom hiring for various farming operations as well as farming systems, including postharvest operations, marketing, horticultural or vegetable crops (high-value crops)	f, O, E, P	Lack of good repair and maintenance will be detrimental to sustainability of custom hiring in future	E, P, G
7	In future, farmers in the Dry Zone may team up in smaller groups to pool required resources to buy selected agricultural machinery for their shared use; or even to act as service providers when those machines are not in use (especially for off-farm use of tractors in transportation).	f, O, G, C		

	OPPORTUNITIES	Concerned stakeholder	THREATS	Concerned stakeholder
8	Postharvest loss reduction, eco-friendly agriculture (e.g. conservation agriculture, precision agriculture) promotion can be achieved through efficient and productive use of agricultural machinery in custom hiring	G, f		
9	There is significant opportunity to increase the cropping intensity and irrigated land coverage by introducing water-saving technologies (microirrigation set up) through custom hiring	G, f		
10	Reducing yield gaps and increasing productivity can be addressed through appropriate agricultural mechanization	G, f		

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Policy and programme recommendations

A number of interventions related to awareness generation, capacity-building and infrastructure can be identified in order to promote custom hiring of agricultural machinery in CDZ for the benefit of the farming community.

Awareness generation and information dissemination

- a) Measures should be undertaken to provide relevant stakeholders with concrete (and specific) information on the performance of various machines for corresponding agricultural operations. Economic and technical performance need to be studied and tested in the context of the characteristics of farming systems in the Dry Zone (i.e. farm size, type, crop, etc.).
- b) Custom-hiring service providers, policymakers and other stakeholders must be enabled to sufficiently understand the custom-hiring market. In-depth market analysis of the custom-hiring environment is needed in the specific context of the Dry Zone. Such an analysis can better estimate the potential of hiring service providers, as well as the total demand for corresponding services; farmers' willingness and ability to pay hiring tariff; and accessibility to repair and maintenance (R&M) services, among others.
- c) Measures are required to make end users aware of custom-hiring tariffs, prior to the new cropping season. Guidelines for maximum tariffs should be prepared by relevant government authorities to protect the interests of all stakeholders, at least until there is a well-functioning market, which is able to negotiate its equilibrium rates.
- d) To increase the popularity of custom-hiring services, success stories of farming systems in conditions similar to their own should be shared with end users. Increased awareness will increase demand for mechanization of farming operations and attract more service providers into the business, creating a competitive marketplace for custom hiring. Different models of custom hiring can be explored and tested in the market. Selected models may be implemented at pilot scale. These pilot projects could be used as extension tools for further promotion and dissemination over a larger area. In addition, the role of extension personnel is crucial, and well-trained extension staff familiar with specific regional needs should be deployed in the CDZ.
- e) The need for better coordination among stakeholders should be addressed through a holistic approach to avoid duplication and gaps. Effective coordination can keep all involved well

informed and help in identifying actual needs of farmers, available potential of the service providers, the theoretical and practical basis of selecting appropriate models (with the help of academia and R&D institutions). It will also enable necessary backstopping through extension and capacity-building support.

Capacity-building

- f) Appropriate training modules should be designed, and frequent training sessions should be organized to train the personnel involved in machine operation (operators) and those who are involved in R&M services. The training will serve as a tool to increase awareness of various stakeholders, leading to custom-hiring services as a means towards achieving climate resilient agriculture and improved livelihood in the study area. Training topics may include, for instance, decision-making to opt between custom hiring and owning a machine; productive, efficient and safe use of machines; preventive R&M; farm budgeting and record keeping.

Infrastructure and support services

- g) As the quality of custom-hiring services depends on machine performance, measures should be put in place to ensure that only good quality machines are made available through custom-hiring services. To ensure quality of services, testing and standardization of machines for agricultural use should be conducted at the manufacturing/procurement/dealership stage. Regular checks of the performance can also be performed through the relevant government units. This can potentially be handled, for instance, through authorized testing centres.
- h) Emphasis should be placed on ensuring availability and affordability of spare parts and R&M service centres in the CDZ in order to support development and uptake of custom-hiring services.
- i) Infrastructure in the form of farm roads, electricity, R&M facilities, service centres and training schools should be strengthened in the region to support custom-hiring services. Increased investment in roads, rural electrification, rural microfinance and banking can provide the necessary impetus to custom hiring, as well as to agricultural mechanization in general, in the CDZ.
- j) Special financial instruments should be devised to bring small farmers into the circle of beneficiaries of financial assistance. Consideration of whether farmers in real need of access to loans are being excluded due to their ineligibility according to existing criteria is needed. Corrective measures must be taken as required. Moreover, processing of loans should be quick and easy to navigate as these are key for many customers in the study area when selecting an appropriate source of finance.

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