
How Inclusive and Effective are Farm Machinery Rental Services in India? Case Studies from Punjab

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ABSTRACT

Increasing cost of cultivation in most parts of India has led to the realisation that mechanisation of farm operations is one of the ways to tackle it as mechanical solutions are more efficient as well as cost effective compared with human labour based activities in most situations. However, given small farm dominance of Indian agriculture, it is not possible and viable for small farmers to own farm machinery and equipment for its use. Therefore, what they need is access to it, and not ownership. This has led to a new phenomenon of custom rental services of farm machinery and equipment in many parts of India by a range of players like co-operatives, private entrepreneurs, organised sector players and even producer companies. In this context of changing landscape of farm mechanisation, the paper examines the small holder inclusiveness of agro machinery rental service channels and the nature and the level of their effectiveness in helping the farmers access better services. It compares the performance of co-operative, private organised and local informal service providers in Punjab and identifies major issues and challenges in delivery of such services across types of farmers and examines the possible policy and enabling provisions to promote cost and quality effective custom rentals of farm machinery in India.

Keywords: Farm mechanisation, Agro-machinery rental services, Punjab.

JEL: Q12, Q16

I

INTRODUCTION

The low yields, increasing costs of cultivation, and the low price realisation due to lack of modernisation of small holder developing country agriculture have been important issues for all stakeholders including private corporate sector involved in marketing of agricultural inputs to farmers and buying farm produce from them. Increasing cost of cultivation in most parts of India has led to the realisation that mechanisation of farm operations is one of the ways to tackle it as mechanical solutions are more efficient as well as cost effective compared with human labour based activities in most situations. However, given small farm dominance of Indian agriculture, it is not possible and viable for small farmers to own farm machinery and equipment for its use. Therefore, what they need is access to it, and not ownership. This was highlighted in many studies during the last decade (Singh, 2000; Singh, 2010). In this context, custom rentals as an institutional innovation has come up in

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some parts of India starting with custom renting of combine harvesters which move across a state and between and across the states for harvesting of wheat and paddy (Singh, 2010) with some entrepreneurs owning and operating more than one machine and with each machine operating for 1800-2000 hours per year as harvesting seasons differ across regions and states (Damodaran, 2016). Punjab has been a pioneer in this innovation in the form of PACSs being facilitated by the state government through PSFC to buy and rent out tractors and farm equipment to needy small farmers at the village level. There were more than 1167 such PACSs in late 2014 as per the Punjab State Farmers Commission (PSFC) list which ran these agri machinery service centres. The PSFC provides subsidies to these PACS for this purpose (30 per cent of cost of machines and equipment upto a maximum of Rs. 10 lakh investment). Further, this was replicated in many other states more recently though not on a large scale. At the same time, many private entrepreneurs have entered farm machinery and equipment custom rentals space, including in Punjab.

In this context of changing landscape of farm mechanisation, the paper examines the small holder inclusiveness of agro machinery rental service channels and the nature and level of their effectiveness in helping the farmers access better services. It compares the performance of co-operative, private organised and local informal service providers in Punjab and identifies major issues and challenges in delivery of such services across types of farmers and examines the possible policy and enabling provisions to promote cost and quality effective custom rentals of farm machinery in India. Section II sets out the context of the paper and discusses the methodology adopted for the case studies, Section III reports the major players and their business models and Section IV discusses major findings on farmer access to the rental services and their effectiveness, and Section V summaries the major inferences and policy measures required to speed up custom rental services for small farmer benefit.

II

2.1 Context

There is no doubt that India's farm mechanisation levels are low (e.g., 22 per cent area under mechanical tillage and 42-45 per cent of operations being mechanised with large variations across regions and states) compared with China, where the level of mechanisation is 48 per cent as against 75-95 per cent in Brazil, Russia, USA and Western Europe. It is low even compared with neighbouring Bangladesh and Sri Lanka (80 per cent tillage being mechanised) (Biggs *et al.*, 2011) though it is very much necessary as it reduces costs and brings efficiency of operations. In India, though the tractor penetration has increased from one per 150 hectares to one per 30 hectares, the use of other farm machinery and equipment has been poor.

There has been a sub-mission on agricultural mechanisation in the 12th Five Year Plan (2012-17) in India. At the same time, the excessive focus on tractorisation through its ownership in India has led to the realisation that what is needed is farm

mechanisation which is more than just tractorisation. Further, given the smallholder context of Indian agriculture, there is a realisation that ownership of tractors and other farm machinery and equipment is not a must for achieving higher farm mechanisation as seen in the experience of neighbouring Bangladesh, Sri Lanka, and Nepal. These countries have seen higher levels of mechanisation within Asia with the help small scale machines like power tillers and diesel engines (single cylinder) but also hiring out of such machines and equipment by local entrepreneurs (lead farmers) to facilitate wider adoption of farm mechanisation (Biggs *et al.*, 2011; Mottaleb *et al.*, 2016). There are no combine harvesters in Bangladesh for paddy or wheat harvesting (Biggs *et al.*, 2011).

It is estimated that out of 118.9 million farming households in India, only 20 million are capable of owning machines like a tractor due to the small size of land holding, lack of irrigation and the kind of cropping pattern followed. Therefore, there has been a policy thrust on promoting mechanisation of farm operations to cut down costs through providing access to farm machines and equipment rather than making farmers own them. This is also needed as availability of farm labour is becoming difficult and costlier due to alternatives available to farm workers outside the farm sector in urban areas and through public employment programmes like MGNREGS implemented by the Government of India since 2005. Since some machines are so large and costly, even local rental use besides own farm use would not make them viable. Therefore, there are 'migratory' combine harvesters which move from place to place (state to state within India) across the harvesting season in order to harvest enough acreage to get enough business. In India, combine harvesters travel up to 600 kms over a period of two months to harvest wheat and paddy. In fact, such migratory outsourcing agencies need specialised support in the form of repairs and maintenance and same prices of parts/components across regions that some combine harvester producers like CLAAS have begun partnering with banks and NBFCs to provide retail level equipment financing quickly and over wide geography to potential machine buyers. It runs operator training courses, service camps and mobile parts vans to meet their needs and increase their uptime.

The farm machinery rental market is estimated to be over \$5 billion in India. In some states like Uttar Pradesh and Punjab, as many as 93 per cent farmers regularly rent in machinery. On the other hand, one-third of tractor owners rent them out in these states and as many as 58-81 per cent in Chhattisgarh, West Bengal and Bihar (Doshi, 2016).

This realisation and local innovations in some parts of India have led to a trend of custom rentals of farm machinery which started in Punjab since the late 2000s which has spread quickly across many villages. This is supported by the state government to cut down cost of cultivation for small farmers. Besides, there are many private initiatives like EM3, Goldfarm, Ravgo, Oxen Farm Solutions and FarMart in this space (Mathur, 2017) which are being attempted as business models and the only way to promote cost effective mechanisation in smallholder dominated context. In some

cases, farmer producer companies (new generation co-operatives or co-operative companies) have also undertaken custom rentals of farm machinery and equipment (SFAC, 2013). The other players in this segment include individual rich farmers, some entrepreneurs and government subsidised custom hiring centers (CHCs) run by individuals and co-operatives who have limited scale and reach (Goyal, 2016).

The growth of custom hiring has led to another set of players who match demand and supply of the service like FarMart which provides access to the machinery to a larger customer base of farmers by leveraging the existing market supply of machinery rather than investing in procuring machinery. It charges 10-15 per cent commission to the service providers for bringing market to them and focuses on high value multi-cycle crops and regions which makes renting for 12-15 times a year as against 5-8 times in case of 2-3 field crops per year regions. Starting with a pilot in 10 villages of Uttar Pradesh, FarMart now has completed 400 orders and average ticket size has been Rs. 800 per transaction. There are 300 farmers and 10 machinery owners registered with it and 60 per cent of customers are repeat users (Doshi, 2016). The major tractor companies in India have also come into this space more recently in 2016 Mahindra and Mahindra started its agri equipment service under the brand name of Trringo with an initial investment of Rs. 10 crore. However, it has taken the franchise route for its business unlike EM3 which owns its all centers. Trringo planned to set up 165 centers by 2016 with each center covering 80-90 villages (Goyal, 2016). Besides Mahindra and Mahindra, TAFE, Escorts and John Deere are also trying out different models of custom hiring. John Deere CHCs number 150 and are in the states of Gujarat, Maharashtra, Madhya Pradesh and Karnataka with each one catering to 1000 hectares. Karnataka would have the largest number (116) of CHCs being set up in partnership with State Government and the rates are 15-20 per cent lower than the market rates (TNN, 2016).

Many state governments are promoting this institutional mechanism for farm mechanisation. Madhya Pradesh is promoting CHCs by training rural youth and providing them 40 per cent subsidy on the investments. The entrepreneur has to purchase a mandatory set of equipment required for farm activities from sowing to harvesting. Each center serves 200-300 farmers in a 10 km radius. Generally, there is only one CHC in a village. Starting with 286 CHCs in 2012-13, it had 474 CHS in 2015-16 and there was a target of 1612 in 2016-17. In Andhra Pradesh, CHCs are run by informal groups of farmers (Bera, 2016).

In Raichur district of Karnataka, a study of farm machinery custom hiring service centres revealed that a centre covered, on an average, 11 villages, 10386 ha of cultivable area and 2926 small and marginal farmers. The services offered were quite nominal as compared to those by private operators. The net return for a centre on an average was as low of Rs. 8822 per annum. Therefore, only 25 per cent of the centres were high performing, another 25 per cent were medium performing and 50 per cent were low performing. The centres had led to an improvement in the income of small farmers by 10-15 per cent (Hiremath *et al.*, 2014).

Since this innovative and cost reducing service provision began in Punjab, first of all, during the last decade, as an institutional effort supported by the state, there have been some studies to assess its impact on farmers. These studies are on the functioning of the Primary Agricultural Co-operative Societies (PACS) undertaking this service at the local level (Sidhu and Vatta, 2012; Singh *et al.*, 2013). A study of PACS run Agro Machinery Service Centres (AMSCs) in Punjab in 2012 found their operations economically viable and generating profits to the extent of 2 per cent to 30 per cent of their annual costs. Further, the services available to farmers were cheaper by 16 per cent and 35 per cent when compared with private sources and self-ownership respectively. These AMSCs initiated in the early 2000s owned machines like tractors and laser levelers with the help of bank loans, subsidy from the government and their own savings. The two AMSCs in Ludhiana district and their farmers, and farmers from two villages without AMSCs were studied based on a sample of 88 farmers belonging to three categories- AMSC farmers, private service provider farmers, and self-owning farmers. The number of machines and equipment owned by the two AMSCs numbered 40 and 27 each with one owning 4 tractors and 6 reapers and 2 laser levelers and the other owning 2 tractors and 4 discs, seed drills, and plankers each. These AMSCs had total investment of the order of Rs. 41 lakh and Rs. 16.61 lakh and total income of Rs. 26 and Rs. 9.5 lakh giving them net return of Rs. 6.3 lakh and Rs. 17,000 being 31 per cent and 2 per cent of their annualised expenditure. It was found that AMSC services were being availed by all categories of farmers. The average size of operational holding across categories was 12.10 acres. The study focused mainly on the use of machines and equipment in wheat and paddy crops as they accounted for 80 per cent of the gross cropped area of the State. Whereas most of the owners happened to be medium and large farmers, those hiring machines from private operators and AMSCs were largely marginal, small, and medium farmers. The average expenditure on the use of farm machinery was the highest in the case of those hiring from private sources followed by those from AMSCs and those owning the machines. The hiring cost was 16 per cent higher in case of private sources compared with the AMSCs. The fixed cost for self-owned machinery made the cost of use 35 per cent higher than that incurred in case of hiring from AMSCs. Only 7 per cent of the farmers using services of AMSCs owned a tractor or a disc which was even lower being only 3.4 per cent each in the case of users of private services. On the other hand, of those owning machines, 90 per cent had tractors, 83 per cent disc harrows, 54 per cent trailer, 23 per cent generator and 3 per cent had a rotavator. The capital investment of the farmers using self-owned machines was 12 and 31 times higher than those hiring machinery services from private owners and AMSCs. The farmers perceived lack of timely availability of machines from the service centres with 46 per cent reporting that as the only major problem. However, most of the farmers (89 per cent) were satisfied with the functioning of the centres and almost all of them (96 per cent) were happy with the hiring charges. The major suggestions for improvement included: increase in the

number of machines in the centres (73 per cent) and higher government support (8 per cent) and training of manpower for handling machines more efficiently to some extent (19 per cent) (Sidhu and Vatta, 2012).

Another study of AMSCs in Punjab based on a sample of 40 custom hiring and 80 tractor owning farmers across four districts in 2011-12 found that most of the custom hiring farmers were marginal, small or semi-medium compared with tractor owning farmers who were mostly semi-medium, medium or large farmers whereas none of the marginal farmers owned a tractor. The other categories of farmers had one or more tractors with an average of 1.23 tractors. The number of non-farm earners was higher on custom hiring households (20 per cent) compared with those owning a tractor (7 per cent). There was lower presence of permanent labour on custom hiring farms (12 hours per annum per acre) compared with those owning a tractor (29 hours per annum per acre). On both types of farms, family labour was of the order of 110 hours per annum per acre followed by 95 hours of casual labour. The custom-hiring farmers had a much smaller operated area, a much higher area under wheat compared with those owning tractors, and had slightly lower yields of the two crops of wheat and paddy. Though their annual per unit income from crops was similar, the custom hiring households had higher income from dairy and slightly lower gross farm expenditure and lower net farm income. However, marginal small and semi-medium farmers using custom hiring earned higher net income than their tractor-owning counterparts. The major problems faced by custom hiring farmers included high cost of hiring, lack of timely availability, and inadequate availability of services (Singh *et al.*, 2013).

Another larger study covering 100 AMSCs across all the 20 districts of the State in 2011-12 out of a total of 1045 such centres, of which 208 were in the private sector, focused only on the operations of the AMSCs found that all the 100 centres which had come up from 2008 to 2012 had tractors with some owning more than one tractor each. The next major equipment was laser leveler owned by 96 per cent followed by rotavator. The other equipments were owned by only a part of 100 centres, ranging from above 50 per cent in case of disc-harrows and ploughs to 35 per cent in case of planks and drills, 25 per cent to 30 per cent in case of disc harrows, bund maker and trailers. The specialised equipment like potato digger, paddy transplanter, sprayers and generators were owned by a few of the older AMSCs. The proportion of own funds used in the purchase of the machinery was 100 per cent in the case of sprayers and bund makers and in specialised equipment like happy seeders, potato diggers and seeder generators and paddy transplanters. Only in case of tractors and laser levelers, it was around 40 per cent. Another major component of financing was 33 per cent subsidy (up to a maximum of Rs. 10 lakh investment) by the State Farmers Commission (PSFC) on the purchase of major machines which was availed by 89 per cent of the centres. The AMSCs, on an average, served 114 farmers in 2011-12 which was 18 per cent of the membership of PACS. The average area covered per centre increased from less than 300 acres in 2009-10 to 400 acres in

2011-12. The centres had an annual average income of Rs. 3.3 lakh in 2011-12 ranging from Rs. 3 lakh to Rs. 6.7 lakh with an average expenditure of Rs. 1.9 lakh ranging from Rs. 15,000 to Rs. 4.2 lakh. This gave a net income of Rs. 1.37 lakh per centre ranging from Rs. 10,000 to Rs. 3.05 lakh (Chahal *et al.*, 2014).

2.2 Methodology

Since there have already been quite a few studies on the economics of owning versus hiring farm machinery for use (e.g., Singh *et al.*, 2013), the focus of this paper is on the inclusiveness and effectiveness of various service providers in the custom rental space. In the co-operative space, a list of 1167 PACSs providing this service was obtained from the State Farmers' Commission as of late 2104. Since Bathinda had the second largest number of such PACSs (9 per cent of total and second only to Moga), it was decided to take up sample PACS from this district. Further, since it is also close to the other District (Fazilka) which has the only large scale private modern custom rental player (ZFS) and very few PACSs with such services (0.5 per cent of total), it was considered to be an appropriate place to compare and contrast the presence and performance of the two models/type of players. Incidentally, since Fazilka has one of the lowest presence of PACSs renting out machines and equipment, it shows that the private player had a space and level playing field to operate and succeed. Thus, six PACS from Bathinda district and five ZFS franchisees from Fazilka were selected for detailed study and, further, the farmers being serviced by these players and those not being serviced were also surveyed to examine the inclusiveness and the effectiveness of the service provision. Thus, 84 farmers in all were interviewed across service providers- local, PACS, ZFS or a combination of PACS and local and ZFS and local, but not ZFS and PACS as there was hardly any overlap between ZFS and PACS in the two districts. The local service provider dependent farmers have been treated as control farmers for both PACS and ZFS farmers (Table 1). The reference period of the study was 2013-14.

TABLE 1. DISTRIBUTION OF SAMPLE INTERVIEWEES FOR CASE STUDIES

Agency (1)	Franchisees/PACS interviews (2)	Farmer interviews	
		Modern channel (3)	Control (4)
ZFS	5	14	
ZFS and local	0	17	
PACS	6	0	
PACS and local	0	27	
Only local	0		26
All	11	58	26

Grand total farmers: 84.

III

FARM MACHINERY RENTAL SERVICES IN PUNJAB

3.1 Private Agri Machinery Rental Service Provider- ZFS and Its Profile

Zamindara Tractors – an Ahuja firm- has 17 distribution outlets across three districts in Punjab, and in Rajasthan since 30 years. New Holland dealership for tractors and machines started three years back. The family also cultivates more than 375 acres across Punjab and Haryana. Basmati 1121, wheat and barley are the main crops besides kinnow, and guava. In 2000 and 2001, there was a sharp drop in demand for tractors and only replacement sales were happening, mainly through exchange offers where farmers replaced old one with a new one and dealers ended up with large stock of old tractors. Even second hand tractor markets had come up in some parts of the state and the Zamindara tried to sell tractors in these markets as well, but of not much avail. Because it was already there in tractor trade and by then the private (captive) finance companies had not come in to provide finance for tractor purchase and farmers had to only depend on banks for loans to buy tractors which was not easy for small holders, it was thought of renovating old tractors and start giving them on rent. It also tried to sell old tractors by renovating them but at that time there was slump prevalent in the market which resulted in not getting sold at the desired pace. Further, the second hand market is different because the buyers wanting to buy an old tractor would buy the tractor in old shape/finishing only so that he comes to know its condition. When it started giving old tractors after repairing them, the idea to start rentals came up. This was also the period of increasing labour shortage in Punjab.

It was in 2001-02 that Mr Vikram Ahuja noticed that John Deere and Class New Holland (CNH) dealers lease and sell old tractors. This was a new phenomenon. Mr. Ahuja also examined the possibility of applying taxi hire and use model common abroad and started giving tractors on rental basis from one centre, with a few tractors. He called it the library model. But, there were occupational hazards in this model as user would change the battery before returning the tractor, remove oil of rear transmission and put kerosene oil or water instead. This led to pitting after 4 to 6 months in the gears of the tractor as the viscosity fell down. By then, about 50 people had used that tractor and it became difficult to find out who had done it. They used to even change tyres. Then, it adopted Standard Operating Procedures (SOPs) and a checklist of items. Finally, it came into equipment rentals in 2006 which earlier farmers used to arrange from within the village. But, it could not install a meter on equipment although it tried, in 2005, a meter on rotavator to know how much it worked. It believed that what cannot be measured cannot be improved. Later, it developed seals, fixed Global Positioning Systems (GPS) on it but again a stage came when it started realising that the whole day was spent on monitoring and the business was seasonal. And it started employing drivers to hire out the tractors which was

called the wet taxi model. It also increased the range of implements but seasonality in the use led to the issue of how to make use of drivers to cut running costs. That is when the partner model was brought in. Once the driver becomes a partner, he takes care of the machines and equipment and becomes involved. Rentals also helped sell second hand tractors as running tractor on rent used to get sold fast because the customer knew that the tractor ran fine, and was in good condition.

It tried wet lease for four years which meant tractor with driver and then moved to dry lease that is hiring out tractor only, and no driver. In dry lease, returns are low and the company starts charging for running time the moment the tractor leaves the company premises. Otherwise, the user can say that he has done only two acres and cannot be questioned. So, it was per hour rental and a meter was installed on the tractor. The company joined hands with Hariyali Kissan Bazaar (HKB)- a rural supermarket chain which could not be viable and has been closed down now- at seven places; wherever HKB was there, it used to park tractors there so that it was closer to farmers. But, there, marginal farmer was not benefitting. It was a Shop within a Shop concept with HKB. They were so happy because their store footfalls increased because of rentals presence. HKB collaboration worked for 4 to 5 years. Dry lease did not work because farmers were reported playing games and wet lease did not work because drivers did not stick for long.

It now has 22 types of machines, and the focus is not on tractorisation, but mechanisation. It purchased six laser land levelers in 2005-06 and 30 more next year. It had fifty tractors and sixty drivers. Now there are 30 partners or franchisees. It has 150 balers, a sugarcane harvester, rakes, pneumatic transplanter, multi crop precision planter, fertilizer broadcaster, sub soiler, fodder harvester, and maize harvester.

Zamindara Farm Solutions (ZFS) set up in 2005 as a separate business unit now owns 170 machines which have been used by 6000 farmers over seven years across four districts (with 300 km. radius from the original centre) and runs it as a business model in an environment of over-tractorisation of the farm sector where affordability for such costly machines is an issue and the crisis of mechanisation is seen in the presence of second hand tractor markets in the state which are held weekly or fortnightly across many *mandi* (agricultural produce wholesale market) towns and large villages. Zamindara's investment of Rs. one million in 2005 had led to a turnover of Rs. 60 million by 2011-12. It used library model and taxi model for custom hiring of machines and tractors with the library model for machines and taxi model for tractors along with drivers. This model (franchising) was adopted along with distribution of tractors by the parent company (Zamindara distributors). After 2-3 years, the franchisee pays the cost of the tractor in Equalised Monthly Instalments (EMIs) from revenue generated and ends up owning the tractor which is promoted as a scheme named: *Chalak Bane Maalik* (Driver becomes Owner).

Its franchises were into custom rentals since average of three years varying from 1-5 years with one each starting in 2009, 2010, 2011, 2012 and 2014, and two of them were landless while others had small land holdings with one of them leasing

land as well, operating on an average of 11 acres, most of it owned in most cases. By occupation, they were drivers, farmers or mechanics. They catered to as many as five village farmers on an average ranging from 3-8 villages with average farmers served being 56 per year ranging from 10-200. Further, they claimed that majority of the farmers availing their services were small farmers except one who reported that only about less than 50 per cent were so. Season-wise, there was not much difference in the use of machinery by farmers in terms of number of farmers, hours of use, and area covered with such use. Very few of them rented disc harrows, cultivator, rotavator or laser leveller or power tiller or generators as the franchisees did not own them. They had more than one tractor in majority of the cases ranging from 2-3 (with two each having 1 and 2 tractors each) and two of them engaging drivers for tractors other than self though for the season and on fixed salary or commission from rentals. Tractor was being used for an average of 850 hours per year which was close to viability norms but widely ranging from 200-1500 hours across franchisees showing that two of them had very viable use of the machine while others were still below desirable use. Only four of them has disc harrow with three using it for less than 100 hours and one for 300-400 hours. Besides tractor, laser leveller, happy seeder, generator, reaper, rotavator, power tiller and seed drill were used frequently during the year.

Mostly, booking was done by farmers on phone (in two franchise cases) or by personal visit to the franchisee service provider (in case of another two franchisees) and mode of payment was cash only which was either paid at the time of booking, or after service delivery or part advance and part after service and only one service provider reported part credit provision. Maintenance was not a big issue as it was partly taken care of by the franchisor (ZFS) and only partly met by service provider which ranged from Rs.15,000-Rs.20,000 per year. The service providers did not promote their services in any big way other than personal contacts in two cases and, in one case, use of village public address system to announce the service availability during the season.

Two of the five franchisees reported achieving viability while others still had to achieve it. It took two and four years each to reach viable operations and the other three were either making losses or were just breaking even. The main reason was that they were either new businesses or had bought some costly machines.

3.2 PACS AMSCs - A Profile

Of the six PACS AMSCs studied, all were on an average working in this activity for five years ranging from 4-7 years and mostly started this business during 2007-2010 with majority in the last two years (2009 and 2010) and all had full time staff which averaged two varying from 1-3. Each one had at least one driver for running the service and one even having two drivers who all worked for 8 hours each and were on casual seasonal employment contract who earned anywhere from less than

Rs.5,000 to as much as Rs.10,000 in most cases and in one case being paid a daily wage of Rs.150. But, all of the case study PACS catered to an average of 2 villages with some even going up to three villages. The membership of PACS ranged from 477 to 1146 with average of 750 farmer members with only one having less than 400 members. But, only 68 per cent members were active on an average. Of all members, only 10 per cent were making use of rental services ranging from 45-150 members across PACS. Three PACS (50 per cent) had 50-100 members each using the services. Only in two cases non-members were also being served which numbered 100- 200 each. Among the users, in case of 3, it was claimed that all are small farmers while in other cases each, less than 25 per cent, up to 50 per cent and more than 75 per cent were reported to be small farmers. The number of farmers in *kharif* making use of the services was higher in terms of number of farmers, hours and acres served compared with that in *rabi*. Further, in *kharif*, in case of 50 per cent PACS, use was only by 40-60 farmers and for another 17 per cent, for 60-100 farmers compared with 40-60 farmers in case of 50 per cent and only less than 40 farmers in case of another 17 per cent. In terms of number of hours and acres covered per season distribution of PACs was not very different across seasons but the average use came out to be higher in *kharif* than in *rabi*.

Each PACS had one or two tractors with majority having only one on an average. A tractor worked for 553 hours on an average ranging from just 40 hours in one case to as many as 1000 hours in another case. Only one PACS had a trailer which was hired out at much lower rate (Rs.250/day) than the going rate in the village which was Rs.400/day. Disc harrow was more common with average of 2 but some having as many as 4 of them and was used for 80-1000 hours per year across PACS with average of 372.5 hours. The most common equipment was rotavator which was there in each PACS and some having even 2 of them. This was also one of the costlier services with tractor costing Rs. 1060 per hour which was not very different from the going rate in the villages and alone Rs. 250 per hour. It was used for an average of 113 hours ranging from 30-250 hours. Cultivator was the most commonly used equipment which was available with five PACS and it was hired out at the going rate in the village and was used for 20-1000 hours per year with an average of 255 hours. Modern and popular equipment was laser land leveler which was owned by all PACS with one owning two of them. It was given out at around the going rate with some lower and some others slightly higher than it and was used for 30-600 hours with average of 218 hours.

Only three PACS had a plunker each which was used only for 90 hours on an average. On the other hand, the ridger available with only one PACS was used even less with average of only 230 hours despite it being given at going rate in the village. PACS most commonly owned seed drill with some having as many as 4 and on average 2.5 each but it was used for 95 hours per year on an average ranging from 10-240 hours. Since potato was not widely grown in the area, potato planter was available with only one PACS and was leased out at the going rate and was used for

only 60 hours. One PACS each also had a reaper and a drolley each with their use being for 130 hours and 650 hours each. All these PACS had availed of subsidy from PSFC of the order of 33 per cent on major machines like tractor and equipment like rotavator and laser leveler. Further, some PACS (2) had availed of bank loan to add to their portfolio or buy machines and equipment besides subsidy while others had put their own money into these assets. One of the two had already repaid the bank loan while the other was yet to do so.

Rotavator, laser land leveler and disc harrow emerged as the most hired equipment across all the PACS with two each reporting in each category. The farmers avail of these and other equipments by mostly visiting the PACS centre (reported by 50 per cent PACS) and also by telephone booking or advance payment booking on first come first serve basis. Payment for the service is generally some advance and some after delivery of service (67 per cent PACS reporting that) followed by only after delivery of service and advance plus part payment after service and part credit.

But, none of the PACS tried borrowing or exchanging machines or equipment across neighbouring PACS. They were also not promoting their services specifically. While four had achieved viability, the two were still to do so. Only two of them faced competition from other players in this service business. The viability was achieved over five years by two of them and over six by another and in just 4 years by one of them. The maintenance cost ranged from a low of Rs. 15,000 to a high of Rs. 60,000 per year with the latter reported by two PACS. The major problems reported in achieving viability in two PACS was delayed payment from farmers and lack of staff to provide the service.

Two of the PACS had started machinery rentals in 2007 and 2008 each and another two each in 2009 and 2010 respectively and had generally more than 500 members with active members being less than 500 in 50 per cent cases. They catered to less than 50 to upto 200 members each. All of them also offered services to non-members which ranged from less than 50 to as many as 100-200 each. All of them reported serving small farmers with one claiming 100 per cent if its members being small and another 25-99 per cent farmers being small with just one admitting that only less than 25 per cent were small farmers. The figures on farmer profile show that these claims are far from reality in most cases as operated holding are very large on an average. Also, since most hired equipment is laser leveler, rotavator and the like, and general tractor owned ship is on average one, the tractor is not used that much which should be cause for concern as that is the costliest machine for a farmer.

Though there was not much difference in the use of machines and equipment across seasons, the hours operated and area covered did differ to the extent that *kharif* usage was somewhat higher than that in *rabi*. Tractor was used much less than desired hours per year ranging from a low of 40 hours to 900 hours with just on reaching 1000 hours and therefore, had implications for viability. Only one PACS was able to use for 100 hours which is norm for viability. The prices for laser levelers were lower than the going rate which was Rs. 600 for 2 and Rs. 650 for one PACS.

Here also, only one PACS was able to reach more than 500 hour use of laser leveler. Two PCs had more than one seed drill and only one used it for more than 200 hours.

The most commonly hired equipment was rotavator, laser land leveler and laser land leveler and disc harrow together in case of two PACS each. All of them had availed of 33 per cent subsidy from PAFC with four for tractor, laser land leveler and rotavator and two for tractor and laser leveler. The booking for service was done by farmers over phone in one case, personal visit in three cases and telephone booking along with advance payment in another case. Mostly, franchises reported that farmers paid some advance (2/3) and some after service followed by only after service and advance plus after service and credit. In most cases, it has taken five years to achieve viability for PACS in this business. The maintenance costs varied between Rs.15,000-Rs.60,000 across PACS depending on the number of machines and equipment owned.

IV

FARMER LEVEL ASSESSMENT OF CUSTOM RENTAL SERVICE PROVIDERS

4.1 ZFS Franchise and ZFS plus Local Source Farmers

Most of the ZFS franchisee serviced farmers were in the age groups ranging from 21 years to 50 years, the largest group being those in 21-30 year age group (36 per cent). Further, most of the farmers were from Jat Sikh caste (85 per cent) with only 15 per cent being from other Sikh/Hindu castes. They were largely secondary literate (57.1) followed by senior secondary (21 per cent) others being graduates or illiterates (one each). Only two had other occupations besides farming. They had owned land which was mostly in semi-medium and medium category in case of 57 per cent with average land holding of 13 acres which ranged from 0.25 acres to 52 acres but due to leasing in by such farmers, the operated land turned out be on an average of the order of 25 acres with 65 per cent farmer leasing in land and which ranged from 0.25 acres to 73 acres. Thus, the operated categories were mostly large and medium accounting for 78 per cent of all farmers (Table 2). Further, farmers had this land at multiple places with average plots being 2.4 ranging from 1-4. Further, two-third of them owned tractors and some had more than one each with some owning cultivator (50 per cent) seed drill, planker and disc harrow (28 per cent each) and two owning combine harvesters (14 per cent).

TABLE 2. DISTRIBUTION OF VARIOUS TYPES OF FARMERS BY TOTAL OPERATED LAND

Service agency wise type of farmers > Land in acres	ZFS		ZFS and local source		PACS and local source		Local source	
	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<5	1	7.1	2	11.8	2	7.4	3	11.5
5 to 10	2	14.3	6	35.3	2	7.4	3	11.5
10 to 25	7	50	5	29.4	16	59.3	15	57.7
>25	4	28.6	4	23.5	7	25.9	5	19.2

The ZFS and local source farmers were generally smaller than their ZFS counterparts both in owned and operated land on an average which ranged from 2-30 acres and 2-52 acres respectively. They were younger in age, had smaller number of plots of land and lesser ownership of tractors. Though they had smaller cropped area of wheat, paddy and cotton as they had lower operated holdings, they hired in many more machines and equipment than their ZFS exclusive counterparts. This shows that ZFS caters to both large and small farmers depending on the local area and the franchisee operations. The ZFS plus local service farmers was secondary and above literate with 70 per cent of them being so and had medium and semi-medium holdings of their own (79 per cent) and 88 per cent holdings in these categories after leased in land was taken into account. Only one farmer had leased out large acreage of land (6 per cent of all farmers). 50 per cent of them had two or less plots and average being just 2 compared with ZFS who has 2.4 plots on an average.

Most of the ZFS franchisee serviced farmers (70 per cent) had semi-medium, medium and large land holding under paddy with only 21 per cent not growing it at all. On the other hand, cotton was grown on much smaller area (semi-medium size) or not grown by a majority of the farmers at all (57 per cent). Wheat was grown by all farmers as it did not compete with other crops in season unlike paddy and cotton competing with each other in the same season. Only three PACS farmers grew potato on a small area of their land ranging from less than 5 acres to 10 acres. Other crops were grown only in less than 5 acres in all categories except in case of one farmer in ZFS plus local service takers and two each in case of PACS and local and only local sources.

The ZFS plus local source farmers had generally grown paddy except 12 per cent and very few grew cotton (35 per cent) while wheat was grown by all of them. Only three of them grew other crops. They hired multiple machines ranging from 2-10 with most frequent number being 2 and 5 and average being about 5 machines. Combine was used by all of them and tractor by 50 per cent of them for 20-40 hours unlike their ZFS exclusive ones who used it only for less than 20 hours each. ZFS franchisee serviced farmers generally hired one or two machines (64 per cent and 21 per cent each) with a few renting in three machines each (Table 3). Tractor was the most common hired machine (by 50 per cent) followed by rotavator alone or with tractor i.e., 35 per cent and 28 per cent each respectively. Tractor was hired for less than 20 hours in majority of the cases.

On the other hand, 59 per cent of ZFS plus local service farmers reported use of rotavator with tractor and 77 per cent farmers used laser land leveler with tractor. Further, 47 per cent farmers used seed drill with tractor by hiring it in. The rotavator with tractor was used only for up to 20 hours by majority (70 per cent) of users. Further, there was larger range of price charged varying from less than 500 rupees to more than Rs. 1000 per hour but modal prices (60 per cent cases) were between 500-1000 rupees per hour. Both rotavator and laser leveler had large range of usage across

farmers with 60 per cent of farmers using it for less than 10 hours or 20-30 hours per season.

TABLE 3. DISTRIBUTION OF VARIOUS TYPES OF FARMERS BY NO. OF MACHINES TAKEN ON RENT

Agency wise type of farmers > No. of machines taken on rent (1)	ZFS		ZFS and local source		PACS and local source		Local source	
	No. of farmers (2)	Per cent (3)	No. of farmers (4)	Per cent (5)	No. of farmers (6)	Per cent (7)	No. of farmers (8)	Per cent (9)
1	9	64.3	0	0	0	0	6	23.1
2	3	21.4	5	29.4	7	25.9	10	38.5
3	2	14.3	2	11.8	6	22.2	6	23.1
4	0	0	1	5.9	8	29.6	2	7.7
5	0	0	4	23.5	3	11.1	0	0
6	0	0	0	0	1	3.7	1	3.8
7	0	0	2	11.8	2	7.4	1	3.8
8	0	0	1	5.9	0	0	0	0
9	0	0	1	5.9	0	0	0	0
10	0	0	1	5.9	0	0	0	0
Total	14	100	17	100	27	100	26	100

Most of the farmer paid Rs.500-Rs.700 per hour for rotavator use with only 15 per cent paying more than Rs.700 per hour. Seed drill was used by 47 per cent farmers with varying hours of use ranging from less than five hours per season to as many as more than 10 hours and the charges per hour were more between Rs.400-Rs.700 and only less than half reported more than Rs.700 per hour. Except one, all the farmers found the service good or very good and the reason cited was adequate availability of the service in 88 per cent cases. Previously, 30 per cent farmers had not used rental service, another 35 per cent each had used local sources and relied on other means of getting mechanised services. The major benefits of custom hiring included: lower cost and, therefore, more viable farming operations suited for small holders, speedy completion of work, and no hassle of maintaining the machines and equipment (Table 5). The major reasons for use by ZFS and local source farmers for use of ZFS franchisee services were availability and nearness of service (47 per cent), only availability (35 per cent) and timely availability of service (18 per cent).

As against new service providers, in case of local sources, payment was made on delivery of service in majority cases (72 per cent) and on part advance and part on delivery in 21 per cent cases and only one farmer reporting advance and some day's credit (Table 4). All of the farmers were satisfied with rental services rating it as good (71 per cent) or very good (29 per cent) and it was mainly on availability they had rated these service providers (79 per cent) as satisfactory or the quality of service (15 per cent). Earlier, these farmers either did not use rental machinery (50 per cent) or used local sources (30 per cent) only or managed through other means (20 per cent). The major benefits of custom rentals were viable operations, lower cost and benefit of large tractor and machine availability (Table 5) due to their infrequent use as owning them was costly and unaffordable. The reasons for use of custom services are as given in Table 6.

TABLE 4. DISTRIBUTION OF VARIOUS TYPES OF FARMERS BY METHODS OF PAYMENT

Service agency wise category of farmers Method of payment (1)	ZFS		ZFS and local source		PACS and local source		Local source	
	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On service	10	71.4	17	100	24	88.9	25	96.2
Advance + on delivery	3	21.4	0	0	0	0	1	3.7
Advance + After a few days	1	7.1	0	0	0	0	0	0
After a few days	0	0	0	0	1	3.7	0	0
After a few months	0	0	0	0	1	3.7	0	0
Others	0	0	0	0	1	3.7	0	0
Total	14	100	17	100	27	100	26	100

TABLE 5. DISTRIBUTION OF VARIOUS TYPES OF FARMERS BY BENEFITS OF CUSTOM HIRING

Service agency wise farmer category Type of benefit (1)	ZFS		ZFS and local source		PACS and local source		Local source	
	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent	No. of farmers	Per cent
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Viability	7	50	3	17.6	0	0	3	11.5
Lower cost	2	14.3	3	17.6	12	44.4	13	50
Better for small farm than owning	0	0	3	17.6	1	3.7	5	19.2
Viability + Infrequent use	0	0	1	5.9	3	11.1	0	0
Infrequently use	0	0	0	0	0	0	1	3.8
Speedily work	1	7.1	0	0	0	0	0	0
Availability of high HP- tractors with heavy machines	1	7.1	0	0	0	0	0	0
Viability +No hassle of repairing and maintenance	0	0	1	5.9	0	0	0	0
Lower cost +No hassle of repairing and maintenance	1	3.7	0	0	0	0	0	0
Viability +Availability of high HP-tractors with heavy machines	2	14.3	0	0	0	0	0	0
Viability +Speedily	0	0	2	11.8	1	0	0	0
Lower cost + Infrequent use	1	7.1	1	5.9	10	37	2	7.7
Lower cost +Availability of high HP-tractors with heavy machines	0	0	1	5.9	0	0	1	3.8
Lower cost +Speedily	0	0	0	0	0	0	1	3.8
Lower cost +No hassle of repairing and maintenance	0	0	2	11.8	0	0	0	0
Lower cost +Availability of high HP-tractors with heavy machines	0	0	1	5.9	0	0	0	0
Total	16	100	17	100	27	100	26	100

TABLE 6. DISTRIBUTION OF VARIOUS TYPES OF FARMERS BY REASON FOR USE OF DIFFERENT SOURCES

Service agency wise category of farmers > Reason for use (1)	ZFS		ZFS and local source		PACS and local source		Local source	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Availability	9	64.3	6	35.3	17	63	17	65.4
Nearness	1	7.1	0	0	0	0	0	0
Timely service	1	7.1	0	0	0	0	0	0
Availability + relationship	1	7.1	0	0	1	3.7	3	11.5
Availability + less price	1	7.1	0	0	1	3.7	0	0
Availability + good service	1	7.1	0	0	1	3.7	0	0
Availability + timely service	0	0	3	17.6	1	3.7	1	3.8
Availability + nearness	0	0	8	47.1	6	22.2	5	19.2
Total	14	100	17	100	27	100	26	100

4.2 PACS and Local Farmer Provided Service Farmers

In general, the PACS service using farmers were not that large with average owned holding of the order of 12 acres and operated size of 19 acres ranging from complete landless and operating just four acres of leased land to as much as 43 acres of owned and 45 acres of operated land. On an average, the land was in 2.4 plots and average number of tractors was 1.22 with four farmers not having tractors at all (15 per cent of total). Some of them did not grow paddy and cotton at all and others average of 13 and 4 acres. Every farmer grew wheat and average of 17 acres. Interestingly, on an average they hired 3.6 machines from PACS centres and they mostly used non-tractor equipment or tractor with equipment if they did not have tractor followed by laser leveler. Rotavator was the most used and the costliest (per hour) equipment followed by combine harvester (Table 3).

The farmers in this category had secondary and senior secondary education (60 per cent) with only one being a graduate. Except one, no-one had any other occupation. 41 per cent did not lease in any land, and 89 per cent did not lease out any land. Only three PACS farmers leased out some land ranging from less than five acres to as much as more than 25 acres. Finally, in operations categories, only 2 were small and two medium with the rest 85 per cent being either medium or large category land operators with as many as up to 5 plots with average being 2.4 (Table 2).

The local farmer who provided custom rental service farmers were also generally smaller landholders or operators than their ZFS counterparts and had this land in just two places on an average. They had one tractor with them on an average and hired only two machines each ranging from 2-7 (Table 3). They were generally younger in age with 39 years as the average age and were secondary or above literate two of them were landless lease farmers and most were in semi medium and semi-medium category in ownership and medium and large in operated terms, with average owned and operated land being 14 and 19 acres each respectively (Table 2). Only two farmers had leased out land and that was in the range of 10-25 acres each.

Interestingly, 30 per cent of them did not grow paddy and 50 per cent did not grow cotton while all farmers were growing wheat. Only three farmers reported growing other crops in area ranging from less than 5 acres to as much as 5-10 acres and more than 25 acres each.

The PACS client farmers used disc harrow in majority cases and for 20-40 hours per season. Disc harrow with tractor which was used only by four farmers cost Rs. 400-700 mostly with one farmer reporting more than Rs.700 per hour. Rotavator was used by only 7 farmers with 4 for less than 20 hours per season and the other three for 20-40 hours each with price per hours being less than Rs. 300 in case of five and Rs. 300-500 for two. Only 6 farmers used seed drill with five using only for less than 20 hours per season and one for 20-40 hours. The self propelled combine charged Rs.1000-Rs.1200 per acre in case of 10 farmers and less than Rs. 1000 in case of other five. The combine was used mostly for upto 20 hours by farmers in this group. Half of tractor driven rotavator paid more than Rs.1000 while other half reported paying between Rs. 500-1000 per hour. Cultivator with tractor was used only by three farmers and only for 5-10 hours by two with only one using it for more than 10 hours and the hiring charges were Rs. 300-500 per hour in two cases and more than Rs. 500 in one case.

Rotavator was hired by only 15 per cent of local farmer service based farmers and for less than 20 hours per season by two of the four and by 20-40 hours and more than 40 hours by another each. It was being charged from less than Rs.300 in one case to more than Rs. 500 in another case with others reporting between this range. Combine (SP) was most commonly used with 70 per cent farmers reporting that and for various durations. Only four farmers (15 per cent) reported use of tractor driven combine harvester which was used for less than 10 hours in most cases and the cost was similar to the modal charges of the SP combines. 31 per cent farmers used rotavator with tractor and it was one of the more used equipments. Only two farmers (8 per cent) used cultivator with tractor and for only less than five or just 5-10 hours. Here again, leaser levelers was the most commonly used equipment with 65 per cent farmers doing that and with varying usage from less than 10 hours per season to as many as more than 40 hours per season.

The charges for laser levelers which was one of the most commonly hired machine and used for upto 20 hours by majority of the farmers was Rs.500-Rs.700 per hour in most cases with just two farmers reporting less than Rs.500. Straw reaper with tractor was used only by 6 farmers with 2 each using it for less than 20 hours, 20-40 hours and more than 40 hours each. Farmers mostly paid on delivery of service in 89 per cent cases and the others paying after a few days or a few months.

Ninety six per cent of the PACS served farmers were satisfied with the service with 11 per cent rating it very good and other as good and only one farmer rating it as poor. The reason for satisfaction was good availability of service in 93 per cent cases. Earlier, most of them used only local sources and few reporting other means like relatives and other sources with only one reporting PACS as the earlier source as

well. Lower cost was a major benefit of the PACS service as it was for local source. Also, availability for infrequent use was a good reason as it would be difficult to buy a machine for infrequent use. Availability and proximity were the major reasons for use of service from PACS and local sources (Table 6).

In case of local farmer provided service users, only 3 farmers (about 11 per cent) used straw reaper and just for less than 20 hours and in one case 20-40 hours. All farmers rated custom service as good (89 per cent) and very good (11 per cent) mainly due to easy availability. A quarter of them did not use agri machinery earlier and another 35 per cent managed otherwise with 42 per cent being users of local sources earlier too. The major benefits reported were lower cost, suited for small holders and viable operations in that order (Table 5).

V

SUMMARY AND CONCLUSIONS

The above examination of the business models of the two new agencies in custom rentals of machinery and equipment in Punjab shows that there is plenty of demand for such services from small farmers in general and from other categories of farmers also for some costly machines which cannot be owned at the individual farmer level. The use of PACS has been an innovative move on the part of the PSFC as it is a local level member based agency which is known for its farmer linkage as it also supplies fertilisers and working capital loans to member farmers. The farmer level analysis of their services across types of farmers – both ZFS, local individual sources, PACS and other combinations shows that in almost all cases, farmers are generally happy using services though in some cases, there is the issue of price of service or timely availability as the sowing or harvesting windows are short. There is a need to encourage this practice across all states and regions with proper incentivisation of service for providers as it is really the most effective way of cutting cost of farm production and making operations more efficient and therefore increase yields as well.

But, none of the PACS tried borrowing or exchanging machines or equipment across neighbouring PACS. They were also not promoting their services specifically. All of them reported serving small farmers with one claiming 100 per cent if its members being small. The surveyed user farmer profile showed that these claims are far from reality in most cases as operated holding are very large, on an average. Also, since most hired equipment is laser leveler, rotavator and the like, and general tractor ownership is on average one, the tractor is not used that much which should be cause for concern as that is the costliest machine.

ZFS franchise system caters to both large and small farmers depending on the local area and the franchisee operations. ZFS franchisee serviced farmers generally hired one or two machines (64 per cent and 21 per cent each) with a few renting in three machines each. Tractor was the most common hired machine (by 50 per cent)

followed by rotavator alone or with tractor i.e. 35 per cent and 28 per cent each respectively. Tractor was hired for less than 20 hours in majority of the cases.

Ninety six per cent of the PACS farmers were satisfied with the service with 11 per cent rating it very good and other as good and only one farmer rating it poor. The reason for satisfaction was good availability of service in 93 per cent cases. Earlier, most of them used only local sources and few reporting other means like relatives and other sources with only one reporting PACS as the earlier source as well. Lower cost was a major benefit of the PACS service as it was for local source. Also, availability for infrequent use was a good reason as it would be difficult to buy a machine for infrequent use. Availability and proximity were the major reasons for use of service from PACS and local sources.

As against new service providers, in case of local sources, farmers were also generally smaller land holders or operators than their ZFS counterparts and had this land in just two places on an average. All of the farmers were satisfied with rental services rating it as good (71 per cent) or very good (29 per cent) and it was mainly on availability they had rated these service providers (79 per cent) as satisfactory or the quality of service (15 per cent). Earlier, these farmers either did not use rental machinery (50 per cent) or used local sources (30 per cent) only or managed through other means (20 per cent).

There is a need to encourage the custom rentals services practice across all states and regions with proper incentivisation of service providers as it is the most effective way of cutting down cost of farm production and making operations more efficient and, therefore, increase yields as well. There should also be rationalisation of equipment keeping in mind the local needs of small farmers. Further, more services could be added or local machine owners could be encouraged to deposit their machines to such centers for their use when idle to cope up with the shortage of certain machines in peak demand season. The state support for co-operatives as has happened in Punjab needs to be replicated elsewhere and private agri startups in this space need to be encouraged with softer loans by bringing them under priority sector lending for longer term loans.

The use of franchising is an ideal way for agri startups and others to scale up this model as this cannot be delivered from a centralised place beyond a scale. Innovations attempting more relevant machines and equipments for such purposes need to be encouraged. In fact, schemes to promote mechanisation in farm sector for new crops like cotton and sugarcane need to keep this model in view as those machines are very costly for individual farmers to own, and make it more inclusive by involving local youth and landless or marginal farmers and professionals. The example of professional custom hiring combine operators in Maharashtra and Gujarat need to be followed. Further, franchising and micro franchising should be seen as an integral part of value chain development and promotion in small holder contexts as it can help lower costs of delivery of various services and to cater to the problem of last mile delivery of basic farm and allied services.

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