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Opportunities for Digital Financial Services for Agricultural Mechanization in Bangladesh

A Market Landscape Assessment

AUGUST 2017 | Tajmary Akter, Md. Majidul Haque and Tasnuba Sinha

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mSTAR offers on-demand technical assistance to support USAID implementing partners and DFS providers in Bangladesh to introduce digital financial services within the agriculture sector in Bangladesh.

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Cover photo: iDE Bangladesh

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ACRONYMS

AFP
Axial Flow Pump

APR
Annual Percentage Rate

ASA
Association for Social Advancement

CSISA-MI
Cereal Systems Initiative for South Asia- Mechanization and Irrigation

CYMMIT
International Maize and Wheat Improvement Center

DAE
Department of Agriculture Extension

DFS
Digital Financial Services

GOB
Government of Bangladesh

ICT
Information and Communication Technology

LSP
Local Service Provider

MFI
Microfinance Institute

MFS
Mobile Financial Services

mSTAR
Mobile Solution Technical Assistance and Research

OTC
Over-the-Counter

PTOS
Power Tiller Operative Seeder

P2B
Person to Business

P2P
Person to Person

SDC
Society Development Committee

TMSS
Thengamara Mohila Sabuj Sangha

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EXECUTIVE SUMMARY

The mSTAR/Bangladesh project, working with the Cereal Systems Initiative for South Asia - Mechanization and Irrigation (CSISA-MI) project, conducted an assessment in six districts of southwest Bangladesh to look at opportunities for digital financial services integration in agricultural mechanization services. This included an examination of potential financial products that could be proposed to financial institutions for creating opportunities for mechanization service providers and users to access financial support through digital channels. The assessment considered feedback from farmers, local service providers (LSPs), dealers, the Government of Bangladesh, national and local private companies, and microfinance institutions (MFIs).

The assessment captured general information about respondents, including basic demographic information such as age, sex, educational attainment, crops for mechanization services and mobile ownership and usage. Ownership and usage of mobile phones was well-established among farmers, LSPs and dealers. It also closely examined the **transaction patterns** detected among local service providers, dealers and national and local private companies, finding that transactions are still **mainly cash-based**. However, **informal credit support was common between farmers and LSPs**, although less than half of interviewed **dealers support sales on credit** to LSPs. Dealers, however, use formal banking channels for upstream transactions that they make with companies.

This assessment includes several **comparative analyses**, such as a comparison between using mechanization services and human labor methods in terms of cost, time and production, as well as the differences in payment methods for services. These analyses found that **mechanization services offered time savings and reduced costs** for farmers, and in instances where payment was made in-kind with crops, an increase in the quality of service. This assessment also analyzed the potential return on investment for LSP mechanization. It found that **LSPs could see a return on their investment within as little as one year for reaper, seeder, and axial flow pump services.** This return on investment analysis supports exploring potential financial products with flexible repayment.

The assessment also considered the access and usage of formal banking channels for savings and financial support, which revealed that more than half of the surveyed **farmers are unbanked**. However, close to three-quarters **(71%) of LSPs and all dealers have bank accounts with formal banks. Seasonal savings are also common among farmers and LSPs**. Besides savings behavior, the assessment also considered the credit-related behavior of these actors. It was revealed that sourcing credit from local MFIs and cooperatives was popular among farmers and LSPs. **Despite being aware of high interest rates, they perceived that MFI and cooperative loans were easier to access and less hassle compared to banks**; however, the repayment terms and conditions were not well understood. Dealers were observed sourcing credit cash (CC) loans from banks.

In terms of awareness and usage of DFS among mechanization actors, **awareness levels are high for mobile financial services (MFS), although extremely low for agent banking.** A significant portion of respondents reported **usage of MFS for family and business purposes, mostly to transfer money.** However, usage was limited to person-to-person (P2P) transactions and over-the-counter (OTC) services for cash in and cash out. Respondents shared the **positive value they experienced using DFS—mainly MFS—primarily in terms of its convenience, security and ease of access. However, cash out fees were perceived to be high, which limited adoption and use of DFS channels for regular transactions**. It was also noted that other services offered by DFS channels like top up, utility bill payment and person-to-business (P2B) payment were rarely availed by these respondents.

With these findings, the mSTAR/Bangladesh team identified opportunities for integrating DFS in selected transaction channels and proposed suitable financial products for farmers and LSPs, considering income trends, capital expenditure and other operational expenses. The following bullets present a glimpse of recommended financial products:

- SAVINGS PRODUCT: flexible savings schemes through DFS allowing them to **save money seasonally** or in a flexible mode that could enhance their savings behavior. This product could also offer loans against savings deposited with a low yearly interest rate.
- CREDIT PRODUCT FOR LSPS: considering LSPs' income trends, working capital requirements, and initial investment, we have proposed a potential loan product for Power Tiller Operated Seeders (PTOSs) and reapers LSPs. **This product could offer agricultural loans at 10% APR with a two to three year repayment tenure and flexible repayment mode.**
- DIGITIZE TRANSACTION CHANNELS: A transaction mapping of agricultural mechanization service value chain actors revealed the possibility for introducing DFS in the transaction flows between farmers and LSPs, LSPs and dealers, and dealers and companies. The transaction mapping portrayed the possibility of introducing DFS among different actors as follows

Between farmers and LSPs

Moderate potential. Considering the proximity between these actors and the average transaction size, MFS could be introduced, although we were unable to explore whether farmers would utilize MFS to make payment to LSPs.

Between LSPs and dealers or local companies

High potential. Considering the average transaction size, agent banking might be a suitable channel to facilitate these payments.

Between dealers and companies

High potential. Agent banking is highly recommended considering the challenges reported by dealers regarding inconvenient timing of banking hours.

- SMALL LOANS FOR FARMERS: small working capital loans, ranging from BDT 10,000 - 20,000 (US$ 125 - 250), that are sufficient to meet farmers' agricultural input and mechanization costs during the cultivation season could be provided via DFS. These should have flexible terms and conditions, and could be coupled with discounts from LSPs.

- INTEGRATION OF OTHER VALUE CHAIN ACTORS: to create more options for transactions through DFS, providers should consider targeting services for other relevant mechanization actors not covered explicitly in this assessment, such as local and national private companies, as well as dealers.
- OTHER CONSIDERATIONS FOR DFS PRODUCTS: other factors for DFS providers to consider include reduce pricing structures, incentives for digital payments, like cash back or discount offers when making transactions, exploring enhanced security features, such as biometrics, and increased activities to increase DFS literacy.
- DIGITIZING THE SUBSIDY REIMBURSEMENT PROCESS: considering the long approval process for availing subsidies, a recommendation was also made to digitize the subsidy reimbursement process to reduce the hassle of paperwork, including the risk of lost paperwork.
- INCREASED AWARENESS OF MECHANIZATION: A partnership between the GOB and private sector could be initiated to support increased awareness of mechanization.

1

INTRODUCTION

1 INTRODUCTION

1.1 Background of the Study

In Bangladesh, agricultural mechanization has expanded significantly over the last two decades.[1] To address different challenges, like population increase coupled with reduced land availability and lower availability of agricultural labor due to labor migration in different sectors, and to develop a sustainable agricultural mechanization system, in 2016 the Government of Bangladesh (GOB) initiated a new strategy and approved the agricultural mechanization roadmap. The roadmap includes visions for the short-term (through 2021), mid-term (through 2031) and long-term (through 2041). The GOB has been working in partnership with government and non-government research institutions, national and international non-government organizations, financial institutions, and universities to implement the strategy of the agricultural mechanization roadmap. Among the strategy activities, one of them focuses on the easy flow of financial support with flexible terms and conditions. Thus, one of the principle objectives of this assessment is to find recommendations to complement the acceleration of mechanization activities in a broader context. To conduct this assessment, mSTAR/Bangladesh worked with the USAID-funded Cereal Systems Initiative for South Asia - Mechanization and Irrigation (CSISA-MI) project, which is working to scale up selective agricultural technology services in southwest Bangladesh. Table 1, presented on the next page, contains the status of agricultural technologies in Bangladesh as of May 29, 2016.[1]

1 Ministry of Agriculture, Government of Bangladesh, Agricultural Mechanization Roadmap 2016

Table 1: Present Status of Agriculture Technology

SERIAL NO.	NAME OF AGRICULTURAL TECHNOLOGY	NUMBER
1	Engines (used in agriculture)	2,500,000
2	Power tillers	700,000
3	Tractors	35,000
4	Rice trans planters	300
5	Seeders	5,000
6	Urea application machines	18,800
7	Sprayers	1,300,000
8	Irrigation pumps (deep tube well, non-deep tube well, power drive pump)	1,753,452 (deep-36,566, non-deep-1,549,711, power drive- 167,175)
9	Solar pumps	320
10	Combine harvesters	80
11	Weeders	250,000
12	Reapers	500
13	Jute Ribboners	40,000
14	Open drum threshers	150,000
15	Closed drum threshers	220,000
16	Maize shellers	15,000
17	Sugar cane shellers	50,000
18	Winnower	2,000
19	Dryers	500
20	Rice millers	15,000
21	Improved parboiling tanks	70

Source: Agricultural Mechanization Roadmap 2016.

The Cereal Systems Initiative for South Asia – Mechanization and Irrigation (CSISA-MI) project is a partnership between CIMMYT and iDE-Bangladesh (iDE-B) and funded by USAID/Bangladesh under the Feed the Future (FtF) Initiative. CSISA-MI seeks to transform agriculture in southern Bangladesh by unlocking the potential productivity of the region's farmers during the dry season through surface water irrigation, efficient agricultural technology, and local service provision. CSISA-MI aims to unlock the potential of these farmers to produce more food from the same parcel of land during the dry season, while conserving that land's ability to produce quality crops over the long-term. CSISA-MI focuses on upstream market interventions to ensure that technologies needed for agricultural intensification are sustainably available through local markets.

1.2
Purpose and Scope of the Assessment

This assessment sought to understand opportunities to:

- Introduce digital financial services (DFS) within the mechanization service delivery process to increase operational efficiency, productivity and accessibility.
- Conceptualize new or customized products in accordance with market demand for financial institutions (e.g. banks) and private companies that could enable dealers and local service providers (LSPs) to access financing with flexible terms and conditions, in order to facilitate mechanization.

1.3
Assessment Design and Sample Size

The assessment was conducted in the two CSISA-MI hub areas, Jessore and Faridpur, which consist of six districts: Barisal, Faridpur, Gopalganj, Khulna, Magura and Narail. The mSTAR/Bangladesh team conducted focus group discussions (FGDs) and follow-up key informant interviews (KIIs) with CSISA-MI's beneficiaries: local service providers (LSPs) and farmers. In addition, key informant interviews were also conducted with relevant stakeholders, including dealers, microfinance institutions (MFIs), private companies (both in Dhaka and in the hub areas), and Government of Bangladesh officials in the field and in Dhaka. The team also conducted interviews with banks in Dhaka. The details of the sampling frame can be found in Table 2 below:

Table 2: Respondent Profile and Sample Size

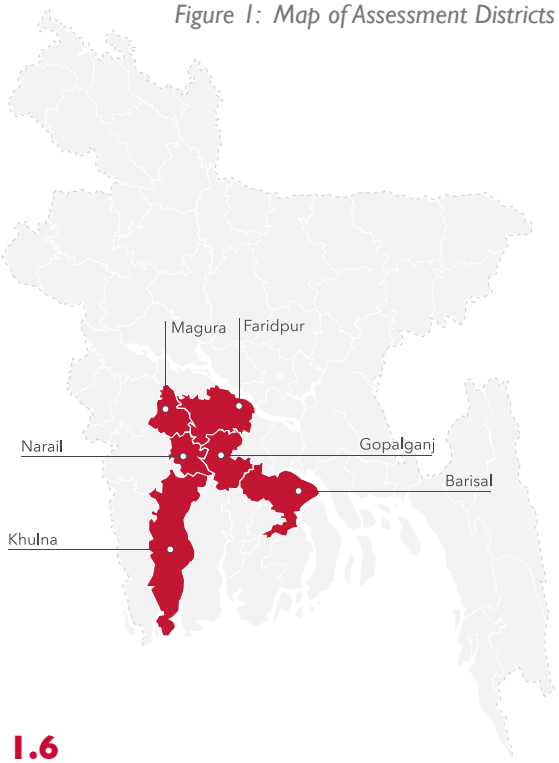
SAMPLING PLAN	DATA COLLECTION METHOD	NUMBERS		
		FGDS	FOLLOW- UP KIIS	KIIS
LSPs	FGDs, follow-up KIIs and KIIs	7 (total 38 LSPs)	8	11
Farmers	FGDs, follow-up KIIs and KIIs	4 (total 33 farmer)	4	7
Dealers	KIIs	35,000		10
GOB officials	KIIs	300		4
MFIs	KIIs	15,000		5
Private companies (district-based)	Improved parboiling tanks	70		2
Private companies (Dhaka-based)	KIIs			6
Banks	KIIs			2
Total Number of FGDs, follow-up KIIs and KIIs		11	12	47
Total Number of Respondents (FGD 71 and KII 47)				118 people

The FGD questionnaires were designed in such a way that both qualitative and quantitative information could be garnered. For the KIIs, structured questionnaires were used. The collected data then went through rigorous analysis using Microsoft Excel.

1.4
Geographical Coverage

As mentioned, the assessment was conducted in the districts of Faridpur, Magura, Gopalganj, Barisal, Khulna and Narail. The map on the right depicts the assessment districts:

Figure 1: Map of Assessment Districts



1.5
Limitations

A major limitation of this assessment is the relatively small sample size, especially for Power Tiller Operated Seeder (PTOS) LSPs. Thus, any analysis or comments regarding a specific actor cannot be considered fully representative within the survey regions. The remarks made in this report, especially regarding transactions and the financial behavior of the actors, give some idea about actors' behavior, but they are not meant to be reflective of all actors. Additionally, this assessment primarily looked at opportunities for using digital financial services within mechanization among the selected sample size and with three selected technologies. Rather than focus on all types of technologies that are used in agriculture, the assessment focused on only three types of agriculture technologies: axial flow pumps (AFPs), power tiller operated seeders (PTOSs) and reapers. This limited our ability to examine digital financial services that could be relevant across the entire mechanization industry and for which a much more comprehensive and larger sample study may need to be carried out. One significant limitation of this assessment is its lack of women participants, due to the fact that women in Bangladesh are often not perceived as 'farmers' or 'LSPs' in the local social context. It should also be noted that there was a transportation strike in the southern part of Bangladesh during the time of this assessment, which impeded our ability to interview one local MFI in Chuadanga.

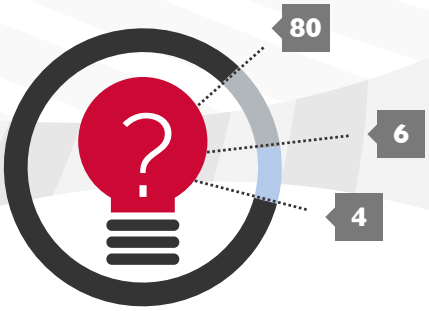
1.6
Commonly Used Figures

An exchange rate of 80 Bangladeshi taka per one US dollar has been used throughout the report. Yields are presented in maunds, which is a local measurement equal to 40 kilograms. All land is presented in decimals, a common measurement in Bangladesh. One hundred decimals are equal to 0.40 hectares.

Photo 1: Conducting an FGD with Farmers in Magura District. Photo credit: Md. Majidul Haque, mSTAR/ Bangladesh.

2

ASSESSMENT FINDINGS



2 ASSESSMENT FINDINGS

This section includes the analysis resulting from the data collected, including the demographic information of interviewed stakeholders. The analysis results contain an examination of mechanization services for crops; ICT usage patterns of farmers, LSPs and dealers; comparisons between mechanization and manual labor methods; return on investment analysis for LSPs; access to formal financial services among farmers, LSPs and dealers; and DFS understanding and usage among farmers, LSPs and dealers. In addition, this section includes a discussion of different support provided by the Government of Bangladesh and other sources like INGOs, MFIs, and agriculture technology supply companies.

2.1 Farmers

In total, 40 farmers participated in the assessment through FGDs, follow-up KIIs and KIIs. The assessment revealed that farmers accessed mechanization services from their nearby LSPs and paid both in cash and crops. From their experience, farmers shared that mechanization technologies are time and cost convenient compared to using human labor. Many interesting findings were revealed; for example, due to manual seed broadcasting practices, farmers rarely use a PTOS for seed sowing. It was noted that for all three mechanization services covered under this assessment, when farmers place requests for services, they are received shortly afterwards; however, during peak seasons, farmers need to place orders earlier and wait up to 15 days to receive mechanization services. Farmers usually meet LSPs in person or communicate over the phone to place service requests and make payment. All but two farmers surveyed owned a mobile phone, and of those, one had access to a mobile phone. Among those who own phones, 18.4% who use smartphones. Section 2.1.1. below provides additional details on the main uses of mobile phones among farmers.

The assessment results revealed that farmers require financial support, not specifically for mechanization services alone, but also for crop cultivation and family emergencies. When requiring financial support, farmers rarely accessed it from formal financial institutions like banks, rather they accessed loans from local microfinance institutions, local cooperatives and extended family members. The findings also revealed that less than half of the farmers surveyed (40%) have access to formal bank accounts. Of those with no access to formal bank accounts, common reasons were lack of available cash flow, limited understanding of their services, and the distance of bank branches from their homes. In addition, the major concerns that farmers cited for limited interest in accessing financial support from banks are long processing times, high interest fees, and mandatory security deposits. Farmers mentioned that the only option available for accessing a loan is from MFIs and local cooperatives. It was noted that the transaction modality of farmers is mainly cash-based, although a significant portion (45%) of farmers have used mobile financial services to send and receive money using over-the-counter (OTC) services rather than through a personal MFS account. More than half of the farmers surveyed (55%) had a positive perception about mobile financial services, citing easy access and risk-free transactions. However, these DFS users also shared that their main concern is the cash out fee, which was felt to be too high and hindered their increased usage. The following section contains a detailed discussion of these results.

2.1.1 General Information: Farmers Profile

A. *Demographic information*

Demographic information was only collected for FGD participants, and not KII participants. A total of 33 farmers (all male) participated in four FGDs as a part of this assessment. It has been observed in rural contexts that people rarely identify women as farmers. From cultivation to harvest, women work in the field and in the home but they are rarely described as farmers themselves, rather they are considered a 'wife of a farmer'. This fact is reflected in the composition of the respondents. The following figure provide additional demographic information.

Figure 2: Age of Respondents

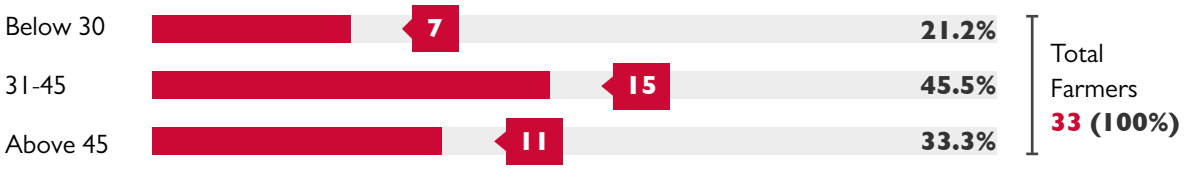
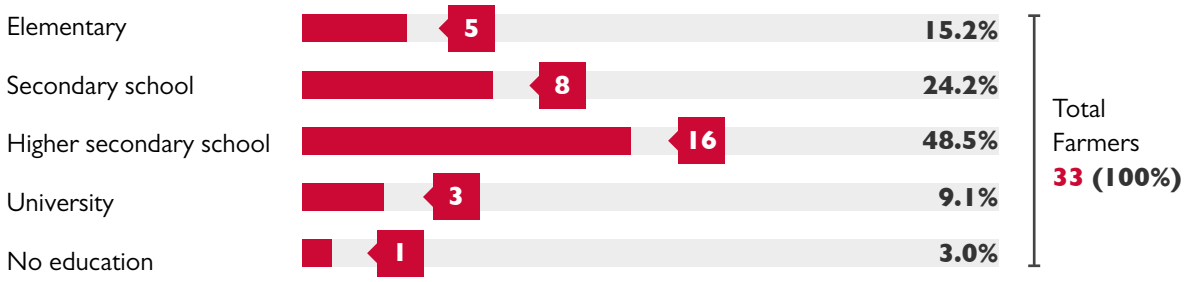


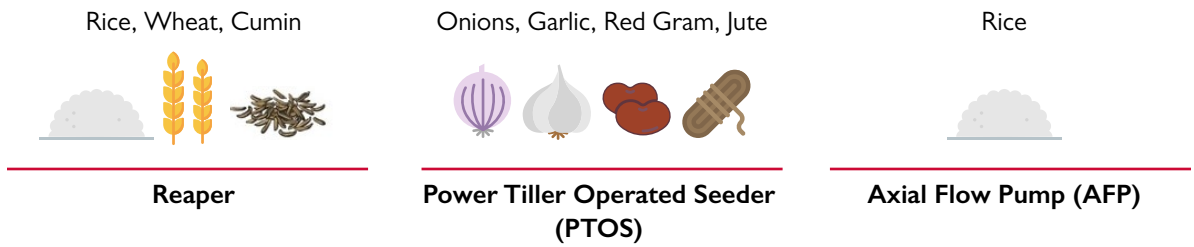
Figure 3: Educational Attainment of Farmers



B. *Farming practices and land covered under mechanization*

Among the respondents, they had been farming for between 2 and 45 years. The survey revealed that rice is the most common crop grown by the farmers, with other major crops grown including lentils, pulses, mustard, onions, sesame, wheat and jute. Some farmers also harvest coriander, banana, garlic and other seasonal vegetables. From the survey, it was found that different mechanized equipment was used for different crops, as shown in Figure 4 below.

Figure 4: Mechanization Service Used Per Crop

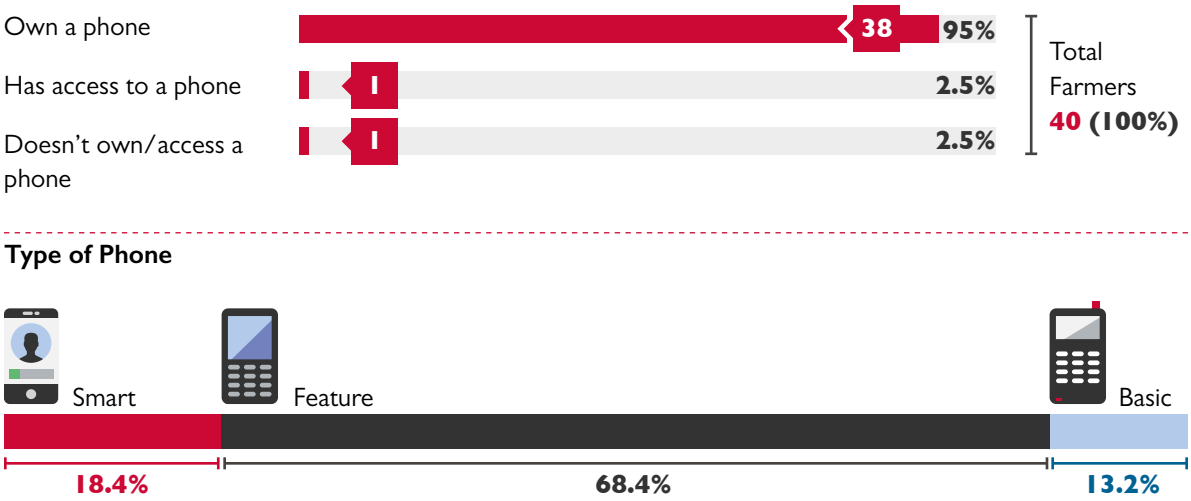


The survey also revealed that most of the farmers used PTOS machines only for land cultivation, although there were a few cases where farmers also used it for seed sowing. In general, farmers surveyed prefer seed broadcasting by hand and hence there was not much need or use of seeders for seed sowing. The survey also recorded the land size which is used for cultivation by the farmers, which range from a high of 384 decimals (1.55 hectares) to a low of 115 decimals (0.47 hectares). During the survey, it was noted that the method of land measurement varied in different districts according to local practices. Thus, the survey recorded results in decimals since this unit of land measurement is commonly understood across the country.

C. Current ICT usage and patterns

It was seen that almost all the farmers who participated in the FGDs and KIIs owned a mobile phone, except for one farmer who did not own a phone but had access to one and another farmer who reported neither owning a phone nor having any access to one. A detailed breakdown is given in the figure below.

Figure 5: Phone Ownership Among Farmers



Of those farmers with phones, just over two-thirds (68.4%) own a feature phone, 18.4% own smartphones, and 13.2% own a basic phone. Although the sample size is limited, the fact that some of the farmers owned smartphones is an encouraging sign.

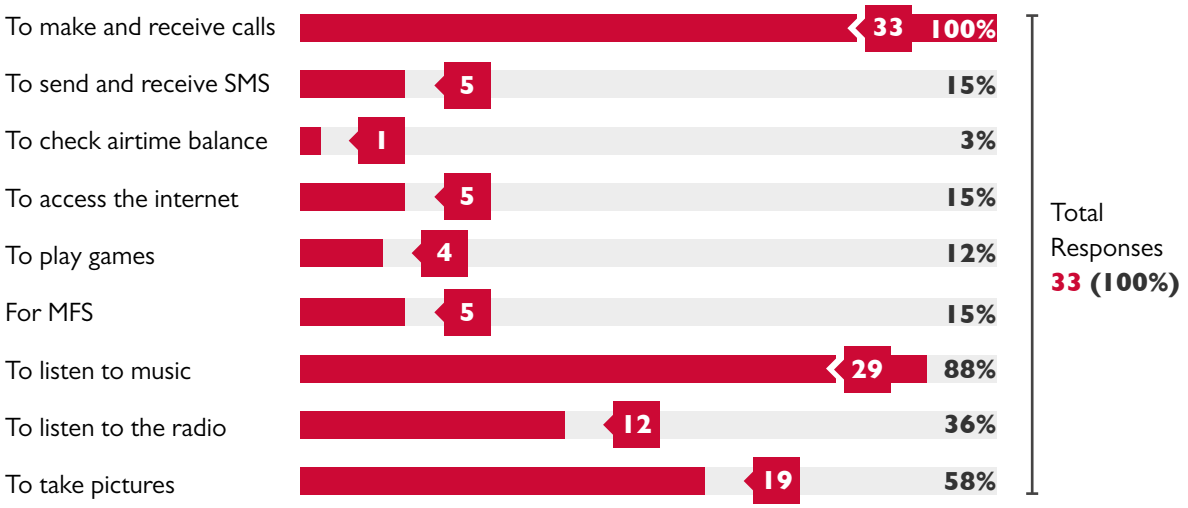
The table below contains the demographic pattern for type of phone ownership based on FGD participant age. While there were 33 FGD participants, only 32 are included in the table below because one participant did not own or have access to a mobile phone.

Table 3: Demographic Pattern of Phone Ownership of FGD Participants

AGE IN YEARS	TYPE OF PHONE			OWNERSHIP	
	Basic	Feature	Smart	Number	Percent
Below 30	1	5	2	8	25%
31 – 45	3	9	3	15	47%
Above 45	1	8	0	9	28%
Total	5	22	5	32	100%

Most farmers reported that they use their phone mainly for family-related purposes, such as talking with family members and relatives, and farming purposes to share or learn information on crop cultivation or communicate with hired labor. Farmers make four to five calls on average each day. In addition, 88% of the farmers with mobile phone access used their phones to listen to music. Their phone usage pattern is depicted in Figure 6.

Figure 6: Purposes of Phone Use Among Farmers



2.1.2 Access to Mechanization

A. *Access to services*

All the farmers in the FGDs and KIIs reported that they access mechanization services from nearby local service providers and thus have a limited number of options based on proximity. When asked about the availability of services, most farmers reported that they are able to access the service on the same day or by the next day after requesting it, however, during the peak season they need to notify the LSPs at least three to five days in advance. A few farmers reported that sometimes it takes as many as 15 days to receive the service after placing a request. When asked about any travel needed to access LSPs, farmers from Khulna, Gopalganj, Faridpur and Magura districts reported that they request the services over the phone and thus there is no travel requirement. On the other hand, farmers in Barisal reported that they travel between two and nine kilometers roundtrip to request services. Such travel takes from 15 minutes to 2 hours roundtrip and costs BDT 10 to BDT 50 (US$ 0.12 – 0.62) for return transportation.

B. *Cost of services*

It has been observed that the price paid for axial flow pumps was in-kind with a share of crops harvested. While for PTOSs, no difference in price was observed among the two districts, for reaper services prices varied between districts. The table below depicts the lowest and the highest price paid by farmers in different districts for each technology per decimal of land. It is important to note that the price ranges presented are based only on participant responses and thus likely do not represent Bangladesh more widely.

Table 4: Price Paid Per Decimal of Land for Each Technology

NAME OF TECHNOLOGY	LOWEST PRICE IN BDT PER DECIMAL	HIGHEST PRICE IN BDT PER DECIMAL
AFP	1/6th of crop	1/6th of crop
PTOS	BDT 20	BDT 20
Reaper	BDT 19	BDT 36

For AFPs, farmers reported that they pay LSPs a portion of the harvested crop for the service instead of cash. Since there are other factors such as the land size and current market price at play, it is difficult for them to answer the exact monetary value of the crop shared. The interviewed farmers shared that they prefer to pay by crop as it is perceived to result in a higher quality of service from LSPs. Farmers cited additional benefits for crop sharing with LSPs such as:

- LSPs tried to provide services on time and take care of the field;
- LSPs spend money to harvest the part of crops they receive as payment for their service; and
- LSPs share in the loss caused by natural disaster or hazard.

To get a better idea about the difference between crop payment and cash, follow up discussions were done over the phone with farmers and CSISA-MI field officers. Table 5 in the following page shows an example comparison from Barisal based on 33 decimals (0.13 hectares) of land as people are familiar with this land size calculation and it is also a standard land measurement in Bangladesh.

In terms of the total price paid for mechanization services, the maximum price paid by farmers for PTOS was BDT 4,000 (US$ 50) for 200 decimals (0.80 hectares) of land and BDT 7,200 (US$ 90) for 384 decimals (1.55 hectares) for the reaper. For AFPs, as discussed earlier, farmers mostly paid in crops.

Photo 2: Irrigation through AFP in a rice paddy in Barisal. Photo credit: M. Ataur Rahman, mSTAR/Bangladesh

Table 5: Comparison Between Crop and Cash Payment Methods

BASIC INFORMATION	CROP PAYMENT	CASH PAYMENT	REMARKS
Land 33 decimals (0.13 hectares) **Labor** 8 people per 33 decimals **Labor cost** BDT 500 (US$ 6) per day and 2 daily meals per person **Average yield** 23 maund **Average cost per maund** BDT 650 (US$ 8)	Farmers shared 1/6th of the crop, 3.8 maund, which has an average market price of BDT 2,470 (US$ 31). LSPs pay for the cost to harvest their share of the crop (1/6th), for which 1.33 labor days are needed at a cost of BDT 665 (US$ 8.3). Subtracting out the costs borne by the LSP from the value of the 1/6th portion, farmers are in essence paying BDT 1,805 (US$ 22.5) to LSPs per 33 decimals.	LSPs charge BDT 1,200 (US$ 15) for 33 decimals. Farmers must also pay for labor costs on the portion of land that would have been paid for by LSPs under a crop sharing arrangement. This comes to BDT 665 (US$ 8.3). The total cost borne by the farmer in labor and fees to the LSP is BDT 1,865 (US$ 23.3) total for 33 decimals.	This comparison showed no significant difference between the two methods of payment. Farmers preferred paying in crops due to increased quality of services provided by LSPs, as mentioned earlier. In addition, with crop payment, farmers did not have to pay in cash immediately and also have reduced labor and meal costs. It is worth mentioning that usually LSPs hire labor if the crop quantity is more than 4-5 maund. Otherwise LSPs invest their time to cultivate lower volume harvests.

C. *Comparison between mechanization and human labor based methods*

The survey uncovered farmers' perceptions regarding the difference between using mechanization services and human labor farming practices in terms of cost, time and production. It should be noted that this comparison is based on the sample interviewed and thus may not represent the entire population.

Table 6: Comparison Between Mechanization and Human Labor Methods

BASIC INFORMATION	TECHNOLOGY	USING MECHANIZATION	PREVIOUS METHOD
Cost and Time	AFP*	» Less time required when using the technology. Farmers specified that it took an average of 1.5 to 2 hours less to irrigate 33 decimals (0.13 hectares) of land.	» Farmers were unable to specify the exact time required for irrigation. Previously, most farmers were using low-lift pumps, which also required labor to dig ditches. Taking an example from Barisal, one farmer mentioned that earlier it took 2.5 to 3 hours to irrigate 33 decimals of land, while with AFP it took 1.5 to 2 hours for the same.
	PTOS	» One day of irrigation is required to make the soil ready for ploughing. » Less labor is needed for land preparation and sowing the seed, which also results in a lower cost of production. Farmers who use the technology for onion cultivation reported that it cost BDT 25 (US$ 0.31) per decimal for land preparation and required 15 laborers at a cost of BDT 300 (US$ 3.7) per laborer per day to sow the seed. Thus, the total costs they reported for 33 decimals of land was BDT 5,325 (US$ 66.5), which consists of BDT 825 (US$ 10) for cultivation plus BDT 4,500 (US$ 56.5) for labor.	» 3-4 days were required for irrigation to make the soil suitable for ploughing. » More labor is needed for land preparation and sowing the seed, which increases production costs for farmers. Using the same example of onion farmers, it was reported that using only human labor cost BDT 35 (US$ 0.43) per decimal for land preparation and required 22 laborers at a cost of BDT 300 (US$ 3.7) per laborer per day to sow the seed. They explained that the soil remains hard after ploughing, thus it requires additional laborers to ladder the land (a method for leveling the soil). Therefore, using this method it costs on average BDT 7,755 (US$ 96.5) for 33 decimals of land BDT 1,155 (US$ 14) for land preparation and BDT 6,600 (US$ 82.5) for seed sowing.

BASIC INFORMATION	TECHNOLOGY	USING MECHANIZATION	PREVIOUS METHOD
	Reaper	» Requires 30-40 minutes to harvest 33 decimals. » After harvesting, it requires four laborers to bind and carry the crops to the warehouse, which costs approximately BDT 550 (US$ 7) per laborer. » Reduced time and less labor results in reduced harvesting cost for farmers. Referring to one example from the assessment, farmers who use the technology for paddy harvesting reported that it cost BDT 33 (US$ 0.41) per decimal for harvesting and BDT 46 (US$ 0.57) for labor costs per decimal. Thus, the total costs for 33 decimals (0.13 hectares) was BDT 2,607 (US$ 32.5), consisting of BDT 1,089 (US$ 14) for the reaper service plus labor costs at BDT 1,518 (US$ 19).	» Takes 4-5 hours for 33 decimals of land. » Twelve laborers are required for 33 decimals of land to harvest and carry the crops to the warehouse at cost of BDT 500 (US$ 6) per laborer. For harvesting paddy, the total labor cost is BDT 6,000 (US$ 75) per 33 decimals of land.
Increased production	AFP	Farmers mentioned that AFP has no direct connection with increased production; if they could avail the service in proper time to irrigate land then it usually results in better yields.	
	PTOS	Farmers reported observations about a higher rate of seed germination due to using PTOS. Thus, farmers expect an increase in yield due to higher seed germination.	While using only labor for cultivation and seed sowing farmers mentioned the low rate of seed germination. Many plants died due to hard soil, which hinders water from reaching the seeds.

BASIC INFORMATION	TECHNOLOGY	USING MECHANIZATION	PREVIOUS METHOD
Satisfaction levels	AFP	Farmers seem satisfied with the technology as it could quickly irrigate their land and reported that it was hassle free. Furthermore, there was no extra direct cost, as they paid with crop share.	
	PTOS	Farmers mentioned that due to high seed germination and reduced production costs the technology is very convenient for them. However, most farmers are not aware that they can use this technology to sow seeds as they have not been given a demonstration and not aware of its benefits.	
	Reaper	Farmers shared mixed experiences after using reapers. On the one hand, some farmers shared that after harvesting a paddy with a reaper, the lower portion of the plant left in the field is bigger in size than what is left from manually harvesting. They perceive this to be positive, as they usually use this as fodder for cattle, although they also know that these could be used as organic fertilizer. On the other hand, some farmers from one interviewed village mentioned that to bind and carry the crop, laborers charged BDT 30-50 (US$ 0.37 – 0.63) more than the usual wage rate for such a small duration of work.	

**Note: during discussions, it was observed that using the AFP still required labor to dig canals to direct water and for taking care of the pump. Farmers followed the same payment method regardless of whether they used an AFP or not, which is 1/6th of crop share. Thus, there was not much difference observed in terms of the payment and labor required with or without AFP.*

2.1.3 Operational support activity

All farmers reported that even while using mechanization services, they require additional labor, especially during the cultivation seasons. Most farmers usually involve their family members as additional support when required. Additionally, 80% of the farmers reported hiring labor during the peak season. When using mechanization services for seed sowing, weeding and post-harvest activities, they require more than one hired laborer in addition to family members.

The survey revealed that 28% of farmers keep regular records of their operational activities manually (i.e. using notebook and pen). A few (10%) farmers mentioned keeping records occasionally, although most (62%) do not keep any records of their transactions and operational activities.

2.1.4 Financial Activities

A. *Financial support required*

From the FGDs and KIIs, it was observed that farmers do not require any formal credit for utilizing mechanization services. Although the services they receive from the nearby LSPs are mostly on credit, there is no formal interest rate or any contract for repayment. They usually have a verbal contract with the service providers and pay them within 15 to 20 days of harvesting the crops, either in cash or crops.

A few farmers shared that they do access credit from Bangladesh Krishi Bank and from NGOs that provide microcredit financing, like the Association for Social Advancement (ASA), for other purposes. The interest rate and the repayment process differs based on the source of the loan. Farmers who received a loan from ASA shared that it had a 44-week repayment tenure. Some farmers mentioned that they received loans from Bangladesh Krishi Bank with a 25% reducing balance interest rate and a two-year repayment tenure.[2] While repayment could be made weekly, farmers could also repay monthly or every two months. During the survey, 24% of respondents mentioned having multiple loans for family purposes. Regarding the associated costs, farmers mentioned that taking a loan from an MFI does not require any security deposit, although farmers must open a savings scheme against their credit. MFI officials visit farmers' homes to collect money, so no travel is required and farmers reported that the loan also includes a life insurance scheme. On the other hand, farmers who took loans from banks, or are aware of how bank loans work, shared that it is necessary to have a security deposit with the bank, which in most cases is the land ownership document, and that they are required to go the bank to make repayments, both of which are disincentives to taking bank loans.

B. *Access to financial services*

40% of the farmers from the assessment recorded having at least one formal bank account, amongst which a majority had savings accounts. The remaining 60% said they have no formal bank account. One farmer also had a current account due to his additional business activities. The survey also revealed that 10% of the farmers owned debit cards, although none of these respondents used the cards.

Photo 3: Conducting an FGD with LSPs in Khulna. Photo credit: mSTAR Bangladesh

2 Interest amounts for reducing balance loans are calculated on the outstanding loan amount, rather than on the full loan amount. In the example provided here, a farmer who repaid weekly over 44 weeks would end up with an effective interest rate of around 11.25% on a BDT 10,000 loan.

> ***"Banking is not for the poor like us. To access a loan from the bank, I have to submit my land ownership document, also I have to pay high interest, so we do not think about banks for accessing loans."***
>
> ***Farmer, Narail***

Among respondents who do not have any bank account, they shared the following reasons for not having one:

- Do not have enough money to save
- Limited understanding of how to use one
- Do not feel the need
- Distance of bank branches

Of the farmers who have an account with a bank, all of them access their account from the nearest branch, which ranged between 2 and 11 kilometers' roundtrip. The time required for travel ranged from 15 minutes to 60 minutes including return and the cost for transportation ranged from BDT 10 – 50 (US$ 0.13 - 0.63). None of the farmers interviewed reported using online banking.

C. Experience with availing services and biggest challenges

Farmers who had a savings account expressed dissatisfaction with the gap between interest rate of savings and loans. Farmers mentioned that the savings interest rate is lower than the interest rate charged on loans. While they said they understand how banking works, they thought that the gap should not be more than 2 - 3 %. It is worth mentioning that according to the existing market practices in Bangladesh, the most competitive difference in the spread between savings and loan interest rates is 5%, so farmers expectations here are highly unlikely to be met. Thirty-nine percent of interviewed respondents felt that savings interest rates should be increased. Those who are accessing credit from MFIs mostly reported dissatisfaction with the interest rate while those using banks remarked upon the long processing times. High interest rates on loans is one of the biggest concerns among farmers. None of the farmers showed any interest in group loans since understandings between members are a concern and they felt that operational hassles might be greater.

Photo 4: Conducting an FGD with LSPs in Barisal. Photo credit: mSTAR Bangladesh

2.1.5 Payment Process

Aside from those who paid in crops, all the farmers made payments to LSPs in cash. Some of this payment was made on-site immediately after service delivery with the remainder given on credit. Many farmers mentioned that to pay the remaining dues, they do not need to travel, as most LSPs are from their own or a nearby community and they meet very often in marketplace or on haat/bazaar days, during which they could pay the due amount as well. However, 36% of farmers reported needing to travel from one to four kilometers to pay LSPs in different districts. Such travel takes from 15 minutes to 2 hours (if farmers walk) including return and costs between BDT 10– 100 (US$ 0.13 - 1.25) including return depending on the distance and area. The walking time farmers mentioned included breaks that they took for greetings with neighbors and friends, for drinking tea and also to make the payment for which they had actually traveled.

The majority (91%) of farmers pay laborers in cash and on-site. Only one farmer mentioned making a portion of his payments following the 'Gata' model, which means that if person A works for person B for one day then person B works one day for person A in return. Another farmer uses family labor, so did not make any payments. The timing of payments to laborers depends on the mode of contract, cropping season and local practices. It could be daily, monthly or another arrangement. As per the survey results, most farmers pay on a daily basis, while a few are bi-weekly or monthly. There is no travel or other associated costs reported by farmers paying laborers. Just under two-thirds (64%) of farmers provide operational allowances, such as extra tips or food to entertain their labors, either in cash, kind or both. In some areas, farmers reported providing operational allowances both in cash and kind, mostly food, betel leaf, and cigarettes. Only three farmers keep records of their payments to laborers.

A. *Largest cost drivers of current mechanization services*

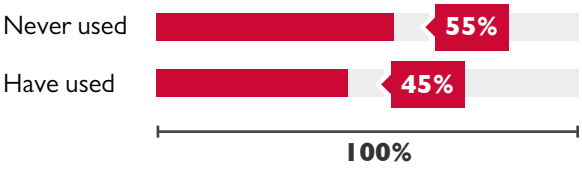
Some of the farmers shared that the charges for accessing mechanization services and labor for seed sowing are the largest costs among the mechanization services they use. Regarding the labor cost, it was also reported that in one village daily laborers charged BDT 30 - 50 (US$ 0.37 - 0.63) more than the usual wage to bind and carry the crops after being harvested by reapers. They asked for this extra amount because the work duration is shorter due to the mechanization services. Before mechanization, these laborers worked from harvesting to carrying the paddy to the farmers' homes, but due to the reaper their working duration has been shortened. However, it should be mentioned that this was only found in one village, and does not represent all areas.

2.1.6 Access to DFS

A. *Awareness, usage and perception of DFS*

For the sake of this assessment, DFS included mobile financial services (MFS) and agent banking. Although the farmers surveyed are familiar with MFS, they were generally unaware of agent banking. Thus, the discussion reflected their understanding of MFS. From the assessment, it has been observed that while all the farmers know about MFS—albeit only by the popular MFS providers, such as bKash or ROCKET—a significant portion (55%) of the farmers were not using these services. The survey revealed that of those farmers who were aware of MFS but had not used it, they were aware of it only as a money transfer service and did not perceive a need for that service. Of the 45% of farmers who know of MFS and have used it to transfer and receive money, they mainly use agent points to transfer money via OTC and cash out. Only 10% of the farmers surveyed have their own account where they receive money. Those who have used MFS have done so for both family and business purposes. The survey also revealed that the respondents who have used MFS reported using bKash, as it is available in their respective areas. Three farmers also mentioned using ROCKET, through Dutch Bangla Bank. During the FGDs, farmers also reported that while other service providers, such as mCash and MYCash, exist in their area, they chose to use those providers that are more popular (i.e. bKash and ROCKET). Those who used MFS reported that agents are within 2 kilometers' distance including

Figure 7: Usage of DFS



return and the highest travel time to an agent by local transport recorded is 20 minutes including return. Some are within walking distance; therefore, all farmers surveyed could easily access these services. Just over half (55%) of all farmers surveyed perceived of MFS positively because it saves time and travel costs, as well as offering less hassle such as no queues, easy access, and secured transaction.

B. *Biggest concerns*

A majority (68%) of the farmers reported that the biggest concern they have is the high cash out fee, which is BDT 18.5 (US$ 0.23) for each BDT 1,000 (US$ 13) transaction on bKash. One farmer mentioned his concern that the USSD menu sometimes did not work due to network problems and that limited their access. A few farmers also felt that their PIN is not a safe way for using this service, as they might forget it or share with someone by mistake.

> ***"I used bKash to send money to my relatives. It is easy and quick. But it is costly for us to use frequently due to its charge."***
>
> ***Farmer, Khulna***

2.2 Local Service Providers

In total, 49 LSPs participated in the assessment through FGDs, follow-up KIIs and KIIs. From the mechanization service business perspective, LSPs shared that these technologies are convenient both for farmers and themselves because they save time, reduce production costs for farmers and increase incomes for LSPs. However, due to old and traditional practices, farmers need more awareness and time

> ***"Farmers are afraid to take risk. I purchased a PTOS but could not provide service for seed sowing in the first year. So, I used the seeder on my own field to demonstrate the results to farmers and promote my service business."***
>
> ***PTOS LSP, Narail***

to adopt these new technologies. LSPs shared their need for financial support for their mechanization and agricultural businesses. Despite a majority (71%) having access to formal bank accounts, only two LSPs reported having loans from banks. Roughly two-thirds (67%) of LSPs managed their working capital by themselves and those who accessed loans mostly reported sourcing loans from MFIs. Despite the dissatisfaction reported by LSPs on the high interest rates of MFI loans, it was noted that accessing loans from MFIs was easy due to less paperwork and quicker processing times compared with banks. LSPs mentioned that access to finance has always been a concern for them as they need loans for small amount that can be issued quickly. They shared their desire to have access to financial products with flexible terms and conditions so that they could repay their loan after one season of services. The return on investment (ROI) analysis showed that for AFP, reaper and PTOS (only for seeder investment), LSPs could achieve a full return on investment in the first year. In the case of the full package PTOS (i.e. power tiller and seeder together), they could see the full return on investment in the second year. The survey showed that LSPs' transactions are mainly cash-based, however more than half of respondents (59%) used digital financial services. DFS, primarily MFS, was mostly used to send and receive money transfers using their own MFS accounts, as well as OTC

services. LSPs who used MFS perceived the channel as a secure, quick method for transferring money. However, LSPs shared their concerns about the high cash out fees of MFS. The following section contains the detailed findings for LSPs.

2.2.1 General Information

A. *Demographic information*

A total of 38 LSPs participated in seven FGDs, consisting of 36 males and two females. Demographic information was not collected on KII respondents. It has been observed that in the assessment areas, women's participation as service providers is very low. One LSP in Khulna shared that people think technology work is a "man's job", so women do not have any interest in this type of work. This also impacted the composition of respondents. Other demographic information is presented and discussed below.

It has been noted that among interviewed LSPs, most (82%) could read and write. More than a quarter of LSPs surveyed (26.3%) have only an elementary education, while another 28.9% have a secondary school education. Only 18% of LSPs stated that they had no formal education.

Figure 8: Age of FGD LSPs

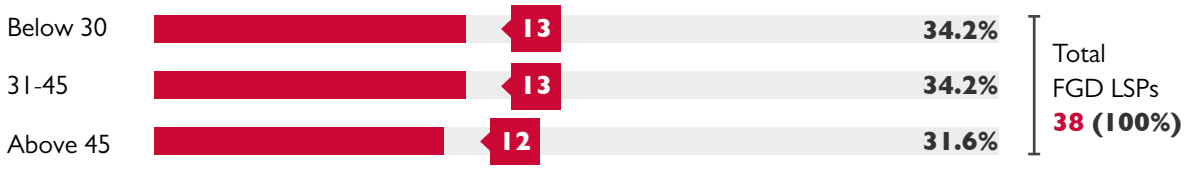
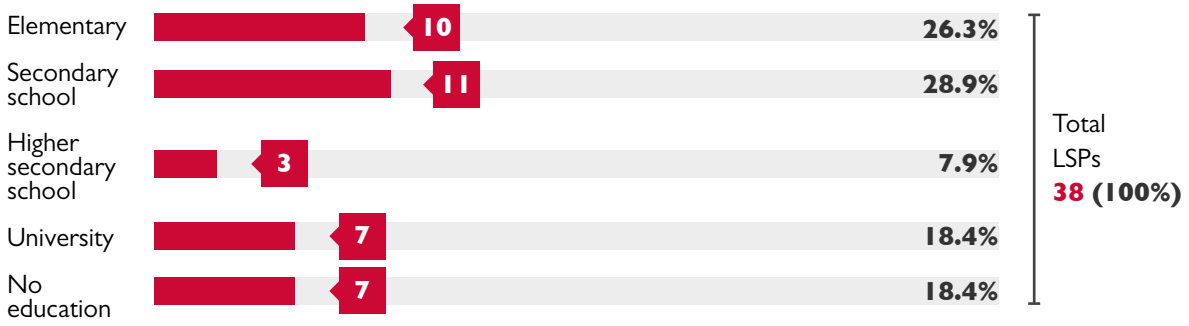


Figure 9: Educational Attainment of LSPs



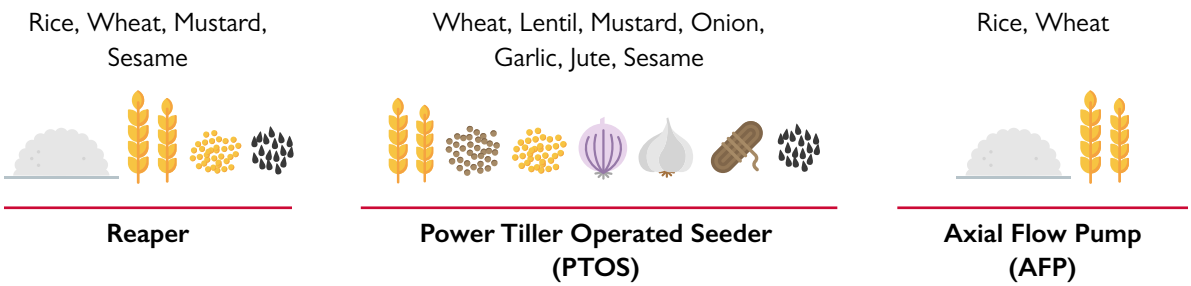
B. *Service and land covered under mechanization*

On average, the LSPs surveyed have been in this business for 2-3 years, with individual experience ranging from two years to almost 20 years in the agriculture business.

The survey revealed that the reaper, PTOS, and AFP technologies are not necessarily all needed for all crops. During the survey LSPs mentioned that farmers ask for mechanization services for only certain crops. Figure 10 contains crops for which LSPs provide mechanization services. It is interesting to note that these do not fully match the crops that farmers mentioned using technology with. For instance, farmers mentioned using reaper services for cumin, although that was not mentioned by LSPs. Farmers also mentioned using AFP services only for rice but LSPs mentioned they also provided AFP services for wheat.

> ***"My neighbors told me I was crazy when I purchased an AFP and started my business. They thought only a man can do such work and now I am doing my business like any other LSP"***
>
> ***Female AFP LSP, Khulna***

Figure 10: Technology Used for Crops



It was also noted during discussions with LSPs that some areas use AFPs for fish cultivation to irrigate ponds. During the assessment, a PTOS LSP from Narail district shared that farmers sometimes ask for a demonstration of seeder services to observe the results before using it on their own land. That LSP stated that he used the seeder to sow coriander seeds on his land for the first time to demonstrate the results.

The interviewed LSPs reported providing services to more than 1,000 decimals (4.04 hectares) of land in a season. The results are presented in the following table, showing the highest amount of land covered by each technology, according to the LSPs surveyed.

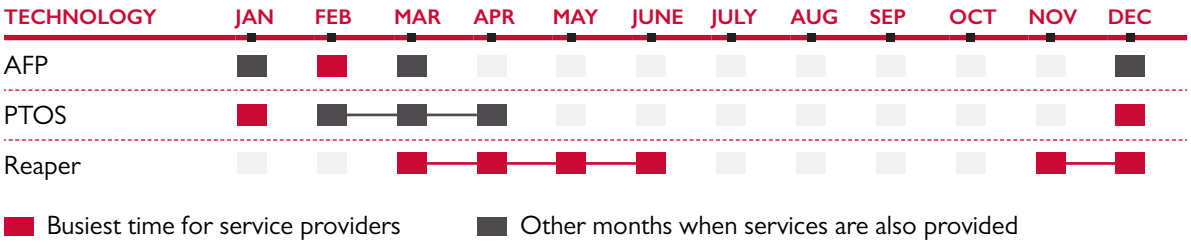
Table 7: Land Covered by Each Technology

TECHNOLOGY NAME	HIGHEST LAND COVERED IN DECIMALS
Reaper	4,500 decimals (18.20 hectares)
PTOS	5,600 decimals (22.65 hectares)
AFP	2,000 decimals (8.09 hectares)

In terms of demand for each mechanization service during the year, LSPs noted the periods when their technologies are most in need. For PTOSs, the season begins in December/January and ends in March/April, with the peak time in December and January.

For AFPs, the season begins in December and ends in March and the peak month is February. Reapers are used for different rice and wheat seasons, and thus are used from March to June and November to December with continuous high demand.

Table 8:Technology Service Calendar



C. Current ICT usage and patterns

Only one LSP did not own a phone. Of those who owned a phone, 63% had feature phones and 25% owned smartphones. Two LSPs owned both a feature and a smartphone.

LSPs stated that they use their phone, on average, around 80% for business communications. It was also reported that they need to communicate daily for delivery coordination and follow-up. This communication mostly happened with farmers, staff and company dealers. All LSPs mentioned that most of their staff and management used phones, mostly either feature or smartphones.

The primary function they use their mobile phone for is for voice communication, with the second most common uses being taking pictures (87%). A significant number (29%) of LSPs reported using their phone to access the internet and use MFS. The other uses of mobile phone among LSPs is depicted in Table 12 on the following page.

Figure 11:Types of Phones Used by LSPs

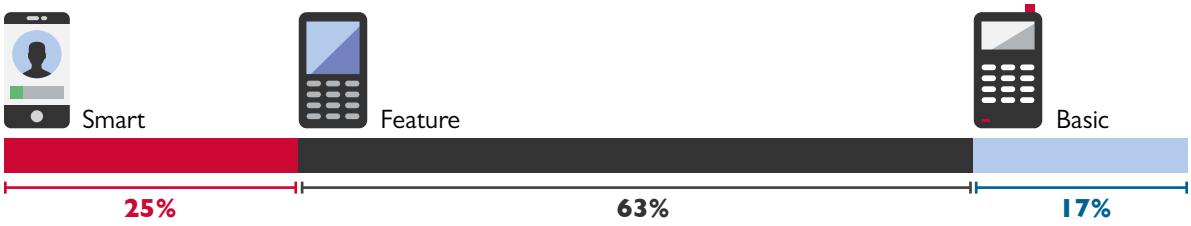
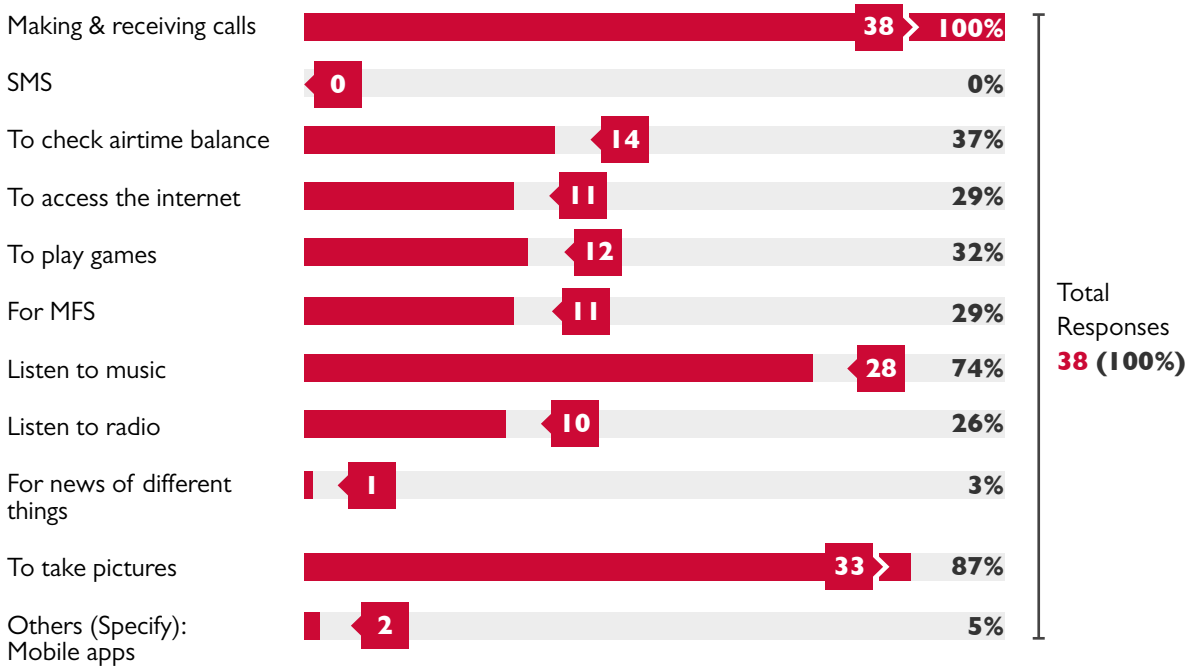


Figure 12: Purposes of Phone Use Among LSPs



Among the 38 FGD respondents, two of the LSPs who were also agricultural inputs retailer also used mobile apps related to their work. One used an app from Bank Asia that allowed them to accept retail payments from customers using a near-field communication (NFC) enabled debit card branded as 'A-card'. The other was to receiving agricultural information for his business. These phones were provided by the USAID Agriculture Extension Support Activity implemented by Dhaka Ahsania Mission. It was noted that in some districts LSPs reported providing a phone stipend to their staff amounting to BDT 20 – 50 (US$ 0.25 – 0.63), which is given to them either weekly or twice a month.

2.2.2 Delivery of Mechanization Services

A. *LSPs' network and service areas*

LSPs shared that although service demand is increasing in many areas, it is taking time to increase awareness among farmers of these services. The demand for services is also not evenly distributed among areas. From the KIIs with LSPs, it was seen that on average, LSPs provided service to around 20 to 80 farmers for reapers, around 3 to 25 farmers for AFPs, and around 3 to 70 farmers for PTOS in a season.

In terms of the distance covered by LSPs, for AFPs they provide services only to farmers within a 0.5km to 1.5km area. For PTOS, this area extends to within 5kms, and for reapers, it is within 20kms.

B. *Cost and service sale prices*

i Technology purchase: When asked about the price of each technology, LSPs stated that there has been a subsidy from the GOB on reapers and PTOS machines. For AFPs, the CSISA-MI project also provided a subsidy for the 4-inch pump through the Department of Agriculture Extension (DAE). In addition, CSISA-MI provides cost share to private companies to provide subsidies to LSPs. These subsidies resulted in much lower purchase prices for LSPs. The subsidy amount for AFPs of national and local private companies are:[3]

- RFL: 75% of the total price
- RK Metal: BDT 5,500 (US$ 69) for 4-inch pumps and BDT 2,000 (US$ 25) for 6-inch pumps
- The Metal Pvt. Ltd: BDT 5,500 (US$ 69) for 4-inch pumps and BDT 5,000 (US$ 62.5) for 6-inch pumps.

There are different types of pumps for AFPs with different prices set by the national and local companies. The price of the pump is usually dependent on the company and size of the pump. For instance, for an RFL pump that is 4 inches wide and 20 feet long, the price was BDT 17,500 (US$ 219), while a 4-inch-wide, 16-foot pump from the same company was BDT 15,200 (US$ 190). LSPs who purchase an RFL 4-inch, 20-foot pump received a 75% subsidy, which is equal to BDT 13,125 (US$ 164), requiring them to invest only BDT 4,375 (US$ 55). Depending on the subsidy amount, LSPs who purchased RFL pumps paid a maximum of BDT 6,000 (US$ 75), while those who purchased RK Metal or The Metal Pvt. Ltd. pumps paid between BDT 11,000 and BDT 15,000 (US$ 137.5 – 187.5).

For reapers, there was a 30% subsidy last season, so LSPs paid between BDT 100,000 and BDT 120,000 (US$1,250 – 1,500) depending on the company they purchased from. In the case of two LSPs, they missed out on these subsidies due to early purchases and thus had to pay around BDT 180,000 (US$2,250) for reapers they bought from ACI. Mounted reapers, for which no subsidies were available, could be purchased for between BDT 38,000 and BDT 45,000 (US$475 – 562.5). Mounted reapers are operated with power tillers, therefore LSPs who already had power tillers purchased this type of reaper.

For PTOSs, there was a 30% subsidy only if LSPs purchased the power tiller and the seeder together. There are several types of power tillers that were observed in the assessment areas. LSPs paid between BDT 100,000 and BDT 150,000 (US$1,250 - 1875) for both the power tiller and seeder. However, the GOB only provided subsidies on specific models of PTOS, which were in the price range of BDT 120,000 to BDT 130,000 (US$1,500 – 1,625) for power tillers and BDT 65,000 – 70,000 (US$812.5 - 875) for locally manufactured seeders. Therefore, it cost around BDT 190,000 (US$2,375) for the full package

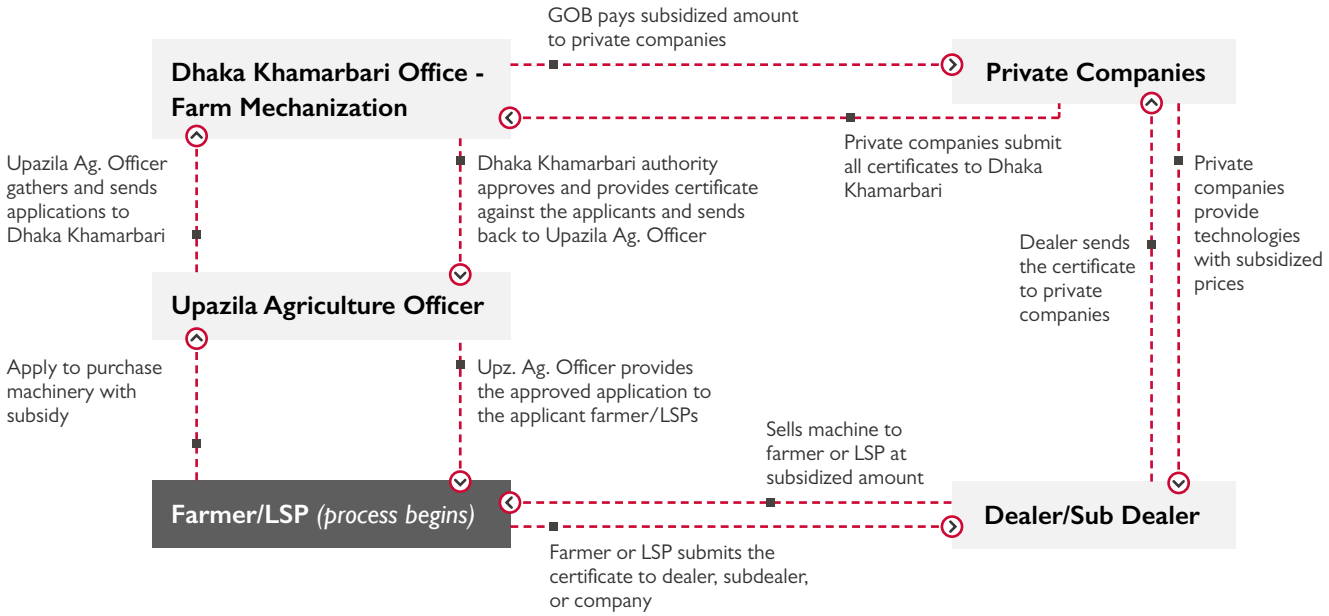
Photo 5: LSP with his PTOS technology in Barisal. Photo credit: M. Ataur Rahman, mSTAR/Bangladesh

3 These companies are mixed in nature, they manufacture some machines and import some machines which they distribute through their channel.

without a subsidy. There are also many other PTOS options in the market with a price range of BDT 95,000 - 115,000 (US$1,188 – 1,438) for power tillers and BDT 35,000 – 45,000 (US$437.5 – 562.5) for seeders, depending on the company. Most of the interviewed LSPs purchased only the seeder, for which they had to invest around BDT 32,000 – 45,000 (US$400 – 562.5).

To apply for the technologies subsidy, farmers or LSPs had to go through the process which is depicted in following flow chart:

Figure 13: Flow Chart for Receiving Subsidies



ii Total revenue of LSPs: From the KIIs, it was noted that the total sales revenue from last season for LSPs for reapers was between BDT 40,000 to BDT 70,000 (US$500 - 875), for PTOSs between BDT 30,000 to BDT 100,000 (US$375 - 1,250), and for AFPs between BDT 20,000 to BDT 50,000 (US$250 - 625).

iii Return on investment: Based on the expenditure and sales value of LSPs for each technology, an analysis for return on investment is illustrated in the following section. This analysis is based on the data collected from interviewed LSPs and discussions with CSISA-MI field staff. It is unlikely to represent all areas or all LSPs. For this analysis, the average land area seen for each technology and average operational costs for each technology was used. Based on these assumptions, the analysis shows the possible duration for return of investment for mechanization LSPs.

PTOS: This analysis examines both investment in only the seeder attachment and investment in the full package, including the power tiller and seeder. Since there are LSPs who purchased the full package to avail the 50% GOB subsidy, as well as LSPs who purchased only the power tiller-operated seeder attachment, the analysis considered both calculations for return on investment.

The analysis considered average land size and all operational costs as constant. For LSPs who purchased only the seeder the analysis shows that they could get a return on investment within the first year of service. For those who purchased the full package and received the government subsidy, they will not begin to see a return on investment until the second year of service. Without the GOB subsidy on the PTOS, LSPs would not see a return on investment until third year of service. It is worth noting that this analysis did not consider the natural growth of service expansion, so it is possible that returns could be made sooner. In addition, the GOB provided subsidies for PTOS up to 70% in 2017 for coastal areas, so LSPs purchasing the full package in those areas will see return on investment sooner.

Table 9: ROI for PTOSs

PTOS			REMARKS
Cost Type	**Seeder**	**Power Tiller & Seeder**	
Capital Expenditure			
Technology price	BDT 45,000 *(US$56.5)*	BDT 190,000 *(US$2,375)*	Technology prices recorded as per field records. For the seeder attachment, assumed the highest price to understand the maximum period required for return on investment.
Government subsidy 50%	BDT 0	BDT 95,000 *(US$1,187.5)*	
Total investment in the technology	**BDT 45,000** ***(US$562.5)***	**BDT 95,000** ***(US$1,187.5)***	
Average operational area (in decimal)	4,127 decimals (16.69 hectares)	4,127 decimals (16.69 hectares)	Sixty percent of PTOS LSPs reported land size covered between 2,500 and 5,000 decimals (10.11 – 20.23 hectares). Therefore, the average land size based on that data is used here.
Operational Expenditures			
Fuel costs	BDT 22,222 (US$278)	BDT 22,222 (US$278)	LSPs usually use diesel fuel. For 52 decimals (0.21 hectares) of land, three to five liters are needed, at a cost of BDT 70 (US$ 0.87) per liter. The average fuel consumption used here was assumed to be 4 liters with the same costs. The average fuel costs assumed 0.08 liters per decimal.
Transportation costs	BDT -	BDT -	No additional transportation costs were reported as LSPs can drive the PTOS.
Labor costs	BDT -	BDT -	Since most LSPs used family labor, there are no significant labor costs reported.
Maintenance costs	BDT 2,000 *(US$25)*	BDT 2,000 *(US$25)*	This cost is based on LSPs per season maintenance costs as recorded during the survey.
Operational allowances	BDT 2,500 *(US$31)*	BDT 2,500 *(US$31)*	Since most LSPs provide allowances, the cost estimated BDT 50 (US$ 0.63) per person per day for an average 50 working days. The working days was assumed based on discussions with LSPs.
Total Operational Costs	**BDT 26,722** ***(US$334)***	**BDT 26,722** ***(US$334)***	
Revenue	**BDT 82,540** ***(US$1032)***	**BDT 82,540** ***(US$1032)***	Calculated based on the payment LSPs receive from farmers, which is recorded at BDT 20 (US$ 0.25) per decimal.
Return on Investment (ROI)	**BDT10,818** ***(US$135)***	**BDT(39,182)** ***(US$135)***	

Table 10: ROI for Reapers

REAPER		REMARKS
Cost Type	**Year 1**	
Capital Expenditure		
Technology price	BDT 170,000 *(US$2,125)*	Technology price as per field records.
Government subsidy 50%	BDT 85,000 *(US$1,062.5)*	
Total investment in the technology	**BDT 85,000 (US$1,062.5)**	
Average operational area(in decimals)	3,414 decimals (13.81 hectares)	57% of LSPs reported land size covered between 3,000 and 4,000 decimals (12.13- 16.18 hectares). Therefore, the average land size based on that data is used here.
Operational Expenditures		
Fuel costs	BDT 6,401 *(US$ 80)*	LSPs usually use petrol as fuel for reapers. One liter of petrol is required for 48 decimals, at a cost of BDT 90 (US$ 1.12) per liter. Thus, the average fuel costs assumed 0.02 liters per decimal.
Transportation costs	BDT 450 *(US$ 5.6)*	It has been noted that transportation costs range from BDT 400 – 500 (US$5 – 6).
Labor costs	BDT 21,000 *(US$263)*	One laborer is needed for 30 days on average per year. Laborers cost between BDT 500 – 900/day (US$6.25 – 11.25) depending on the area. Thus, an average daily cost of BDT 700 (US$ 8.75) was assumed for this calculation.
Maintenance costs	BDT 500 *(US$ 6)*	This cost is based on LSPs' per season maintenance costs as reported in the survey.
Operational allowances	BDT 1,500 *(US$ 18.7)*	An estimation of BDT 50 (US$ 0.63)per person per day for 30 days was made.
Total Operational Costs	**BDT 29,401 *(US$ 367.5)***	
Revenue	**BDT 122,904 *(US$1,537)***	Calculated based on the payment LSPs receive from farmers, which was recorded at BDT 36 (US$ 0.45)per decimal.
Return on Investment	**BDT 8,502 *(US$ 106)***	

The analysis considered the average land size and all operational costs as constant and did not consider the natural growth of service expansion. In addition, natural hazards and disasters were not considered during analysis. Based on this analysis, LSPs receiving the government subsidy will see a return on their investment on the very first year of service, although without the GOB subsidy they would not see a return on investment until second year of service.

Table 11: ROI for AFPs

AFP			REMARKS
Cost Type	**With subsidy**	**Without subsidy**	
Capital Expenditure			
Technology price	BDT 17,700 (US$ 221.2)	*BDT 17,700 (US$ 221.2)*	Technology price recorded for a 4-inch, 20-foot AFP from RFL, which was commonly purchased by LSPs interviewed during this assessment.
Subsidy from CSISA-MI (75%)	BDT 13,275 (US$ 167)	*BDT 0 (US$ 0)*	
Total investment in the technology	**BDT 4,425** ***(US$ 55.3)***	**BDT 17,700** ***(US$ 221.2)***	
Average operational area (in decimal)	1,327 decimals (5.36 hectares)	1,327 decimals (5.36 hectares)	All AFP LSPs recorded land size covered between 1,000 and 2,000 decimals (4.04 – 8.09 hectares). Therefore, the average land size based on that data is used here.
Operational Expenditures			
Fuel costs	BDT 2,614 (US$ 32.6)	*BDT 2,614 (US$ 32.6)*	LSPs reported that for 33 decimals land, one liter of diesel fuel at a cost of BDT 65 (US$ 0.81) per liter. Thus, the average fuel costs assumed 0.03 liters per decimal.
Transportation costs	BDT 300 (US$ 3.75)	*BDT 300 (US$ 3.75)*	On average, LSPs need to pay BDT 300 (US$ 3.75) to carry the pump to the service point by auto van.
Labor costs	BDT 6,000 (US$ 75)	*BDT 6,000 (US$ 75)*	LSPs occasionally hire labor. On average, they need one laborer in a season at a cost of BDT 400 (US$ 5) per day for a total of 15 days on average.
Maintenance costs	BDT 1,250 (US$ 15.62)	*BDT 1,250 (US$ 15.62)*	At the beginning of the season, LSPs perform maintenance for the full season. The cost is between BDT 1,000-1,500(US$12.5- 18.75). Thus, BDT 1,250 (US$ 15.62) is assumed for this analysis.
Operational allowances	BDT 750 (US$ 9.3)	*BDT 750 (US$ 9.3)*	An estimate of BDT 50 (US$ 0.63) per person per day for 15 days was made.
Total Operational Costs	**BDT 10,614** ***(US$132.6)***	**BDT 10,614** ***(US$132.6)***	
Revenue	**BDT 47,772** ***(US$597)***	**BDT 47,772** ***(US$597)***	The interviewed farmers reported paying in crops, however there are some areas where farmers pay in cash to AFP LSPs. That information was collected from a CSISA-MI project officer. The payment is BDT 36 (US$ 0.45) per decimal, which was used to calculate the revenue amount.
Return on Investment (ROI)	**BDT 32,733** ***(US$ 409)***	**BDT 19,458** ***(US$ 243)***	

The analysis considered the average land size and all operational costs as constant. Also, it did not consider the natural growth of service expansion. The analysis shows that LSPs could see a return on their investment within the first year of service. It is worth noting, however, that this analysis is based on the cheapest AFP available after the subsidy from CSISA-MI—and there is no guarantee that this subsidy will be continued in the future.

2.2.3 Operational Support Activity

Almost all LSPs (95%) reported having warehouses, mostly in the yards of their home. They made sheds using tin and bamboo, which can be used to store the reaper, PTOS and other technology. Only one LSP, who provided AFP services, reported that he did not require any separate place to keep it, as it was stored in a room in his house.

The survey revealed that all the LSPs use either petrol or diesel as fuel to operate the technologies. For transportation, it was noted that 21% of LSPs use their own transport while 53% of LSPs use rental transport, usually an engine van for transporting the technology to the service delivery point. The remaining 26% of LSPs who reported not using any transport either could drive the technology or carry it with the help of local people. LSPs who provide PTOS service mentioned that they could drive the technology to the farmers. Likewise, LSPs who provide AFP services shared that usually they provide services to nearby areas, so two or three farmers can carry the pump to the field for irrigation.

Almost all LSPs (95%) reported keeping records of their operational activities manually using pen and notebook, except for one LSP who explained that he never saw the need for recordkeeping.

2.2.4 Financial Activity

A. *Financial support*

The survey revealed that almost none of the LSPs have any financial partners in their business. Only one LSP shared that he received financial support from his brother while purchasing his reaper, although this support did not cost him any interest or additional expense. LSPs accessed financial support through subsidies from GOB and from CSISA-MI (for AFPs).

In addition, 33% of the interviewed LSPs stated that they received support from CSISA-MI in terms of loan support, in which CSISA-MI paid the interest rate on MFIs loan on their behalf.

> ***"[CSISA-MI] supported us a lot. It is hard for us to get access to financial support from a bank. Being a woman, I know that the bank will never give me a loan as I have no ownership or any such assets that the bank could value like land or shop ownership documents. So, for any financial support I go to the local cooperative, it is easier to source a loan from a cooperative."***
>
> ***Female AFP LSP, Khulna***

B. *Support to farmers and associated costs*

Just under half (47%) of LSPs provided services on credit and farmers either paid in cash or in-kind, primarily with rice. This credit system is dependent on local practice and based on mutual understanding between LSPs and farmers. LSPs do not charge farmers interest. There was also not a fixed repayment tenure, although they shared that farmers usually pay the dues within 15-20 days of harvesting, with some credit also paid during Halkhata.[4]

When asked about travel requirements for money collection, 61% of LSPs reported that no travel is required. Since most of the farmers are from nearby communities, they can visit the LSP and pay their dues. It was commonly reported that LSPs meet farmers in the nearby marketplace or on haat day (market day) and collect their dues. The remaining

4 Halkhata is a special occasion that is organized by businesspeople in their retail location or house. They invite their customers and entertain them with food. Customers pay all or most of their dues on that day to close that businessperson's credit book for the year. This event usually takes place after the rice harvest, but it can be in different months according to regional cropping patterns.

39% of LSPs reported the need to travel to collect dues. Those LSPs mentioned that they need to visit farmers an average of 2 – 3 times to collect dues. This travel takes an average of 60 minutes including return and costs less than BDT 100 (US$ 1.25) in total per trip.

C. Access to formal financial services

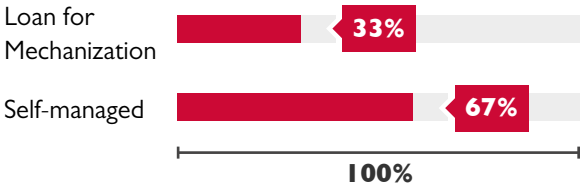
i Access to formal bank accounts: 71% of LSPs have at least one bank account with a bank. Of these, all reported having a savings account and only 3 LSPs reported having both a savings account and a current account. All LSPs who have bank accounts accessed them from nearby branch locations, with distances recorded from less than one kilometer to 22 kilometers including return. The travel time required to reach the nearest branch ranged from 30 minutes to 1.5 hours' roundtrip, and the highest travel cost was BDT 50 return. None of the LSPs interviewed use online banking services. Among the respondents, only four had received a debit card for transactions. Among the 29% of respondents without a bank account, they shared the following reasons for not having one:

- Have access to immediate family member's bank account that they can use when necessary
- Do not feel the necessity of having a bank account
- Prefer to invest in livestock instead of savings
- Have no ability to save regularly or repay loan with high interest rate

Regarding general savings behavior, 63% of LSPs regularly save either with a bank or MFI. The other 37% of LSPs save seasonally in their home and depend on cash available on hand.

ii Access to working capital for mechanization: The survey showed that 33% of LSPs accessed working capital for their mechanization business only from MFIs. In addition, two LSPs reported that they purchased reapers on credit that was provided to them by a national private company. For all three of the mechanization technologies covered in this assessment, the CSISA-MI project will pay for the loan interest to the MFI on behalf of LSPs, therefore all LSPs who received loans for the equipment reported that they received loans with 0% interest and with a two-year repayment tenure. The other 67% of LSPs mentioned that they managed their working capital for their mechanization business on their own.

Figure 14: Access to Working Capital for Mechanization



Among all respondents, 12% of LSPs had more than one loan running simultaneously; among them two LSPs reported that they took a loan for family purposes and again for purchasing the technology.

During the survey, LSPs shared that they have also accessed loans from banks and local MFIs for other purposes not related to mechanization, mostly for family reasons like their daughter's marriage, medical treatment and to purchase cattle. The interest recorded for such loans ranges between 15 and 25%. The LSPs received loans in cash from banks and MFIs, which is disbursed to LSPs at the bank branch or MFI office. Those who accessed loans reported a travel

distance for collecting or repaying money of between 0.5 kilometers to 7 kilometers, including return. It has been noted that LSPs did not report extra travel costs for these distance as they walked in most cases. For repayment, the MFI officer visits the LSP's house. Only in Faridpur did four LSPs share their need to travel to a specific place to make payments, which takes, on average, one hour and costs BDT 50 (US$ 0.63). To access working capital from banks, LSPs mentioned the need to place a security deposit against the loan, which in most cases is land or a shop ownership document.

> ***"We prefer accessing loans from MFIs and local cooperatives as it is hassle free, it is less paper work, requires no security deposit and we know each other very well. We know that the interest rate is high but comparing with bank it seems a better option to us."***
>
> ***Farmer, Khulna***

iii Experience with availing services and biggest challenges: All LSPs reported their dissatisfaction regarding the savings interest rates they received from their savings account. They felt that a 6 – 7% interest rate is not justified while they are paying 15 – 25% interest on credit. Further, 61% of LSPs reported their dissatisfaction with existing credit from both banks and MFIs, as in their opinion, both charge high interest rates on loans. LSPs shared that banks charge around 15 – 16% annual interest rates. Only Bangladesh Krishi Bank charges 12% on agricultural loans, although their loan processing time was perceived to be long. MFIs charge 20 -25% annual interest rates on credit. Moreover, bank processes are very lengthy and a security deposit is required. For example, if an LSP needs BDT 30,000 - 50,000 (US$ 375- 625), they need to submit land or shop ownership documents valued above BDT 100,000 (US$1,250). However, 39% of LSPs expressed their satisfaction with sourcing loans from MFIs. They reasoned that MFIs do not need security deposits, that the process is comparatively quick, and they can get small loan amounts. They perceive these factors as convenient, so see accessing loans from MFIs as a better option than borrowing from relatives, informal money lenders, or banks. LSPs mentioned that the security deposit required by banks and high interest rates, particularly from MFIs, are the major challenges for them to access and manage working capital.

2.2.5 Payment Processes

All LSPs make payments to dealers, as well as local and national level companies using cash, with the exception of one person who has also made payments using MFS. That LSP in Khulna mentioned that he used bKash to make payment to dealers using OTC at a cost of BDT 20 (US$ 0.25) for BDT 1000 (US$ 12.5). The results revealed several types of payment practices, such as LSPs making payment both on delivery of technology and on credit if they could access it. Some national level companies requested advance payments for the technology, in which case the LSP would make a partial payment in advance and pay the rest in installments. Seventy-two percent of LSPs made their payment on delivery of the product, and 16% of LSPs reported that they made part of the payment in advance and paid the remaining amount on delivery. Only 12% of LSPs were able to receive the technology fully on credit, due to having a good relationship with the dealers. Most (89%) of the LSPs had to travel to make payments to the dealer or company. The furthest travel distance recorded was 35 kilometers roundtrip, which cost

BDT 400 (US$ 5) in transportation costs. Less than half (42%) of LSPs keep records manually for these payments. When receiving payments from farmers, 84% of LSPs received cash from farmers either on delivery of service or on credit, with the rest receiving in-kind payment. LSPs often meet with famers in marketplaces or nearby their homes, so no significant travel costs were reported by them. For incoming cash, only 10% of LSPs maintain records, all of whom record the records manually.

Of the LSPs interviewed in the KIIs and follow-up KIIs (in total 19 LSPs), almost all (95%) of the LSPs make payments to hired labor in cash, generally in monthly payments. In some districts, LSPs paid on a daily or bi-weekly basis. All payments are made on-site and no travel or additional costs were reported for this. The survey also revealed that 74% of LSPs provide operational allowances to their staff either in cash or in-kind and 37% of LSPs provide food, cigarettes, and fuel as operational allowances. Aside from operational allowances, LSPs also provide Eid bonuses, performance incentives, and a small amount of money as tips. All LSPs paid their electricity bills by depositing cash in the bank, mostly on a monthly basis. Only two (11%) reported having used bKash for electricity bill payments for which they paid BDT 10 (US$ 0.12) as a fee. The two LSPs who utilized bKash were 7 kilometers and 22 kilometers return from their nearest bank branch, which costs BDT 20 – 50 (US$ 0.12-0.63) and takes 30 minutes to 90 minutes return travel. Thus, bKash was used to save the time necessary to visit a bank branch for electricity bill payments. Apart from these two cases, the distance recorded for electricity bill payment ranged between 1 and 2.5 kilometers with return. The highest cost recorded was BDT 20 (US$ 0.25) and longest travel time was 30 minutes.

2.2.6 Largest Cost Drivers of Mechanization and Logistical Challenges

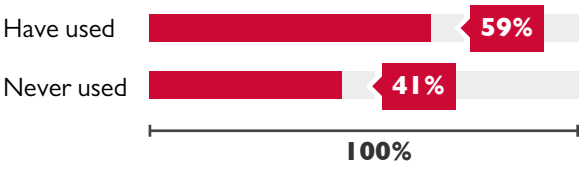
The survey revealed that 47% of LSPs found fuel and labor are the biggest drivers of cost in the current system. One LSP mentioned that the technology price is the highest cost they have. Almost two-thirds (63%) of respondents reported not having any logistical challenges associated with payments. However, 37% reported some logistical challenges associated with payments such as carrying cash to deposit in the bank, especially to distant branches, which was reported as risky and challenging by LSPs. In addition, LSPs mentioned that keeping cash in their shop or home also felt risky as it could lead to theft.

2.2.7 Access to DFS

A. *Awareness and perception of DFS*

While discussing awareness and perception of DFS, it was noted that LSPs are familiar with MFS, although only one LSP in Narail had heard of agent banking. It was revealed that MFS, especially bKash, is well known and used by LSPs.

Figure 15: Use of DFS Among Local Service Providers



According to the survey findings, 59% of LSPs have used DFS for business purposes, such as making payments to dealers or receiving payments from farmers. They also used DFS for family purposes, such as sending and receiving money from family members. It was also reported that bKash was the most common MFS provider that LSPs used, mostly because of its availability. To use the MFS

service, LSPs reported visiting the agent points for transactions using OTC services. The distance they traveled was within a range of 1 to 1.5 kilometers. Traveling this distance was reported as manageable for LSPs. Transportation to agent points was usually done by walking or occasionally using local transport, which cost BDT 20 (US$ 0.25) roundtrip and took a maximum of 30 minutes. The other 41% of interviewed LSPs reported not using DFS services, primarily because they are unaware of the types of services offered by DFS providers.

Just over half (53%) of interviewed LSPs saw the possible value and perceived advantages of DFS, particularly mobile financial services. Some of the perspectives shared included that:

- DFS is very efficient, as people can make financial transactions very quickly
- It is also helpful for sending money to family members who are far away
- Transferring money using an MFS account and agent banking account is more secure than carrying cash, which could be stolen

A few (10%) respondents had negative perceptions of MFS, mostly related to high fees and concerns about fraud, which creates additional risk. The remaining 37% of respondents did not share any thoughts on the value of DFS, mostly because they have never used such services.

B. *Biggest concerns*

The survey revealed that the biggest concerns shared by most of the respondents about DFS was the existing pricing structure. While some (14%) LSPs thought that the pricing structure is fine compared to associated costs from other channels, their main concern was the risk of using such services. For example, if they press an incorrect number, then they could lose money. Another concern shared was that their PIN could be easily disclosed leading to theft of their funds.

Photo 6: A Dealer Shop in Faridpur. Photo credit: Md. Majidul Haque, mSTAR Bangladesh

2.3 Dealers

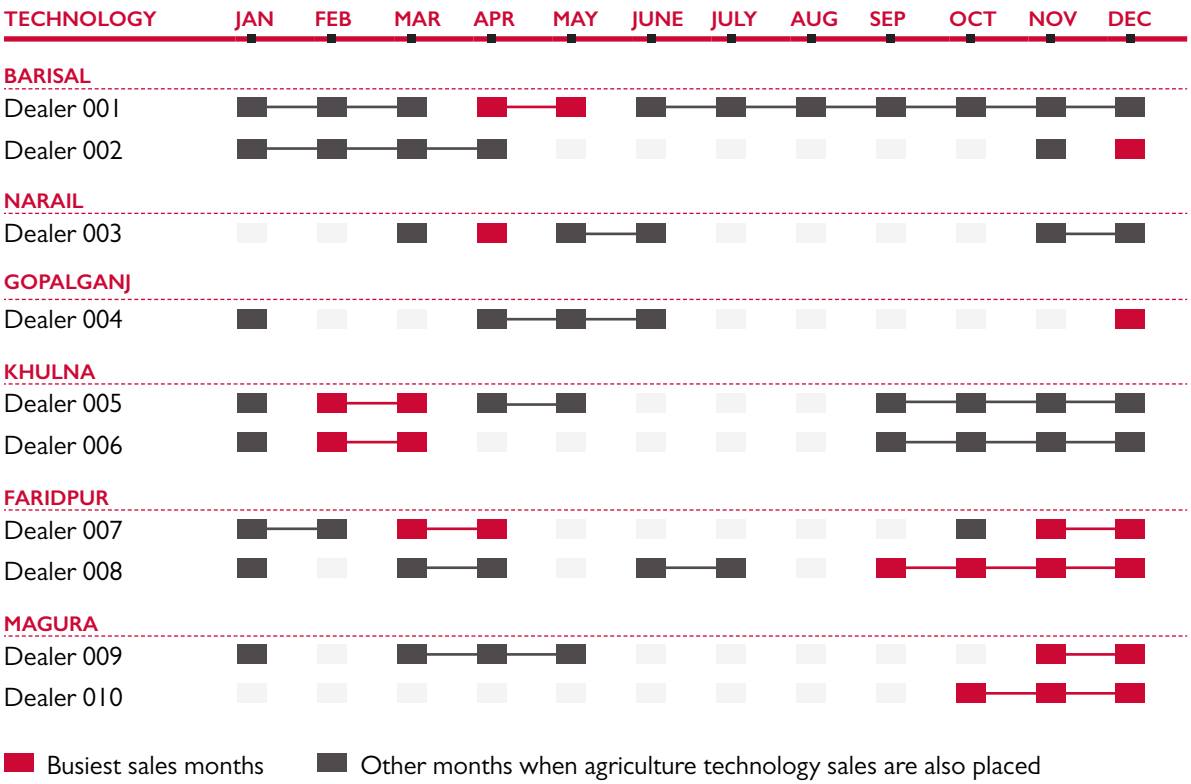
Ten dealers from six districts participated in the assessment through key informant interviews. The interview results revealed that all dealers have sold a range of agriculture technologies like tractors, power tillers, shallow machines, pumps, reapers and seeders. Forty percent of dealers provide sales on credit to their known LSPs and famers for a 2 to 3-month period, depending on their relationship with those LSPs and farmers. It was noted that all interviewed dealers maintain accounts with banks and reported regular transactions through the bank. It was interesting to note that despite having access to banks, 30% of dealers mentioned accessing finance as the biggest challenge for their business. Dealers shared their concerns about high interest fees and long processing times hindering their access to financial support from banks. The results revealed that half of dealers are using DFS, specifically mobile financial services, for multiple purposes. However, these users reported their concern about cash out fees, which they felt were high. The following section discusses these results in more detail.

2.3.1 General information

A. *Business nature and sales area*

All the respondents have had a business license and have been in the agriculture business for 10 to 30 years. However, they noted that they have only been working in agricultural mechanization for 3 to 5 years. Dealers noted that they sell a range of technologies, including pumps, shallow machines, reapers, power-tillers, and seeders. From the KIIs, it was noted that the sales area for the dealers covers nearby districts and Upazilas. Based on the data collected from the dealers, there is no set peak period. As can be seen from the table below, there is a lot of variety in terms of when and for how long each dealer does the most business.

Table 12: Business Calendar of Dealers



B. *Current ICT usage and patterns*

All the dealers interviewed use mobile phones. When asked about the type of phone they used, 60% were using feature phones, while the remaining 40% use smartphones. Among the interviewed dealers, only two dealers had both smartphones and feature phones. Dealers used their mobile phones mostly for business purposes, such as for communicating with their staff, for delivery coordination, and contacting third parties.

2.3.2 Business profile

A. *Dealership and value chain overview*

Most of the interviewed dealers reported being dealerships for multiple national and local private companies. Among the national companies sold in their store, RFL, ACI, The Metal, and Gazi were most common for reapers, AFPs and PTOSs. In addition to these, a few other local companies carried were Alim Machineries, Janata Engineering, and RK Metal. Dealers surveyed reported receiving more than one delivery from one to two companies during the last season. They placed orders based on their understanding of current market demand for that specific technology from farmers and LSPs.

When asked about their value chain network in terms of LSPs, farmers and others, dealers mentioned that they know many farmers and LSPs, not only for mechanization technology purchases but also because of other business dealings and communications. The survey data revealed that all the dealers have regular communication with 30 – 40 LSPs on average, except for one interviewed dealer who mentioned having a network of around 100 LSPs from different areas. All dealers reported that most LSPs they know reside nearby their business area or live in the same village. The business relationships with LSPs mainly rely on trust, as there is no formal contract. In addition to LSPs, dealers' networks also include national and local companies, where relationships are based on contracts with specific terms and conditions.

B. *Price and sales*

The table below contains the price range of selected technologies and the maximum number of sales reported during the survey.

Table 13: Price and Sales Volume for Technology Sold

TECHNOLOGY	PRICE *(EXCLUDING GOB SUBSIDY)*	HIGHEST SALES VOLUME IN A YEAR *(NUMBER)*
AFP*	BDT 15,000 - 22,000 *(US$ 187.5 - 275)*	100
Reaper	BDT 100,000 - 120,000 *(US$ 1250 - 1500)*	16
PTOS *(only seeder attachment)*	BDT 32,000 - 45,000 *(US$ 400 - 562.5)*	70

**Note: there was no GOB subsidy for AFPs. CSISA-MI shared the cost with DAE, which was discussed in section 2.2.2 above.*

The survey revealed that both farmers and LSPs purchased technology from dealers, and that many dealers sell more than one type of technology. It was difficult for dealers to disaggregate sales volumes for farmers and LSPs, therefore the highest sales volume mentioned in the table above is an aggregate total. The highest sales recorded for overall business by any of the dealers interviewed was BDT 30 million (US$ 375,000).

2.3.3 Operational support activities

All dealers have retail shops in the market areas in their Upazila. Most (80%) of the interviewed dealers have 2 - 3 warehouses, mostly near their stores and houses. In terms of transportation, 40% of dealers have their own transportation, mostly engine van and pickup van, and 20% of dealers use rental transport when necessary. All dealers mentioned the need for additional labor, all dealers have permanent staff Part-time staff were hired by 70% of the dealers, based on demand. The highest number of part-time hired laborers reported by dealers is 10. In Khulna, one of the dealers, recognized as the biggest dealer of RFL in the district, employed 12 full-time staff in his technology business. In addition, 21 staff were provided by the different companies to support sales in his store; these staff are paid by those companies. Almost all the dealers (90%) keep business records manually, except for one dealer who does not have any regular record keeping practice.

2.3.4 Financial Activities

A. *Financing support and conditions*

During the assessment, it was revealed that some dealers (20%) have a partnership with MFIs whereby the dealer will refer LSPs or farmers who need financial support to the MFI. Forty percent of dealers shared that they provide support in the form of credit on the sale of technology to LSPs and farmers. One dealer mentioned that he supports the LSP as guarantor if an LSP wants to take a loan from an MFI or NGO that provides microfinance support, such as ASA. Of the dealers who provide sale on credit, 75% mentioned that they do not charge any extra amount or interest, except in one case where the dealer reported charging depending on the credit volume and period.

> ***"Often farmers and LSPs ask to purchase on credit. If the company provides us technologies on credit then we could also provide on credit. But it is hard for our business to provide credit sales to LSPs and farmers from our own capital. I provide credit to a few LSPs who are my regular customers."***
>
> ***Dealer, Narail***

B. *Access to formal financial services*

All the dealers have either a savings or current bank account. Some dealers have multiple accounts, including both savings and current. Most of the dealers reported maintaining an account with a state-owned bank. All the dealers accessed their account from a nearby branch, which tended to be within one kilometer, required a maximum of 15 minutes in travel time and a maximum cost of BDT 20 (US$ 0.25) return. In terms of working capital, 40% of dealers shared that they accessed loans for their business' working capital. Regarding the terms and conditions of these loans, dealers reported that they utilize cash credit type loans with 16% interest rates. When it comes to online banking, 70% of the dealers have used it through their bank to send payments to their technology suppliers.

C. *Biggest challenges to accessing working capital*

According to three of the dealers, accessing finance is a challenge. Dealers who accessed cash credit loans mentioned that the biggest challenges associated with accessing and managing working capital is the security deposit and high interest rate. They mentioned that

to access loans from the bank, they must provide a security deposit. In most cases this is a land or shop document, which is not always manageable for them. Another challenge shared by the dealers are banking hours and collecting money due to them on credit from customers. One dealer noted that customers who reside remotely send money via MFS, although he perceived the cash out fees as being too costly.

> ***"Why should we [pay higher interest rates], while other big businessman get [low interest rates]? We also need banking services even after banking hours and on non-banking days"***
>
> ***Dealer, Magura***

2.3.5 Payment process

All outgoing payments to farmers, LSPs, are 100% cash-based. However, for national and local companies, many of the dealers availed online banking service through bank to make the payment. Dealers deposit cash at the bank against the company owned or selected account to make the transfer through wire transfer method. These transactions took place in same area where the dealers' retail shops are located, as bank branches are nearby. Besides cash, only one dealer sometimes made transactions using MFS through OTC. Dealers made payment upon delivery of the product, however, if the company asked for an advance then a partial amount was paid in advance and the rest paid on credit, depending on the company. Dealers make these transactions by themselves and almost without any additional costs. Only one dealer mentioned an additional cost of BDT 35 (US$ 0.43) as an online transfer fee per BDT 100,000 (US$1,250) transaction through the bank. Usually dealers do not maintain any records of outgoing payments, with the exception of one dealer who kept bank receipts as records.

For incoming payments from LSPs, farmers or others, all the dealers received cash except for two dealers who received payment in both cash and cheque. Only one dealer reported receiving payment through MFS. More than half of the dealers (60%), received money on delivery of the product, although 40% provide credit to farmers and LSPs and therefore receive payment according to the terms agreed upon. To collect dues owed to them, 40% of dealers reported needing to travel between 35 and 50 kilometers with maximum travel costs of BDT 300 (US$ 3.75) return. Of the interviewed dealers, 50% reported having sometimes received payment through their own MFS account and through OTC.

In terms of payroll, all the dealers reported that payments are made completely in cash and paid to staff on-site. This is normally done monthly, although a few part-time staff received payments daily. Less than half (40%) of the dealers mentioned keeping records manually for payroll, while the remaining dealers do not keep records of payroll payments.

For operational allowances, 60% of the dealers mentioned occasionally providing them to their staff. Most of the operational allowances are cash. Operational allowances may be extra pay for making a sale or based on performance. Allowances are sometimes given during Eid or for other festivals, along with money to purchase airtime or pay phone bills. Among those dealers who provide allowances, 33% mentioned that they provide food or small snacks as an allowance. No dealer keeps any record of such allowances, as they are not made regularly.

All dealers make utility payments by depositing cash into the bank each month. Normally this is done either by themselves or a family member. Since bank branches are within one kilometer distance from the dealers, travel costs are also not an issue for the dealers, with a maximum cost of BDT 10 (US$ 0.12) roundtrip. Except for a copy of the bill, no additional recordkeeping is made by the dealers.

2.3.6 Access to DFS

A. *Awareness, usage and perception of DFS*

Like farmers and LSPs, it was noted that in terms of DFS, dealers are predominantly familiar with MFS, with little knowledge of agent banking. Only one of them had heard of agent banking but did not know any details about it. The survey revealed that 70% of interviewed dealers have a limited understanding of MFS. They know that MFS can be used to transfer money, but no understanding of any other services available, for example bill payment or airtime purchase. Fifty percent of dealers use MFS (mainly bKash) to receive money and cash out from agent points. These dealers received payments from LSPs and farmers. Among these, three dealers have their own MFS account and use MFS regularly for business purposes to send and receive money, as well as for family purposes. Interestingly, although these three dealers receive money directly into their wallet, they are more likely to send money to others using OTC as they feel that method is more secure and they won't make any mistakes, such as entering the wrong account number or PIN. The usual transaction size through MFS as reported by dealers ranged from BDT 5,000 – 10,000 (US$ 62.5-125). Another 30% of dealers reported having no understanding of digital financial services.

Seventy percent of the dealers who noted having awareness of MFS also had positive perceptions of it. They shared that these services create more options for people. All the dealers who have used MFS shared that the service is efficient, saves them money and time, makes transactions quick and easy, and is risk free. Thirty percent even shared that although they had never used agent banking, they thought that it may have some positive aspects as well considering the extended banking hours and higher transaction limit. However, one of the interviewed dealers shared that MFS is too expensive for him to use regularly.

B. *Biggest concerns*

While discussing concerns regarding using DFS, 40% of the dealers who use MFS services, shared that high cash out fees are their biggest concern, while only one dealer expressed concern about the risk of theft.

2.4 Other Stakeholders

A total of four Government of Bangladesh (GOB) officials, two local company and six national level private company officials, and five MFI officials were interviewed for this assessment. These interviews took place both in the field and in Dhaka.

From the Department of Agriculture Extension (DAE), three officials were interviewed at the district level and the Program Director-Farm Mechanization was interviewed in Dhaka. The two local companies interviewed were Janata Engineering in Jessore and RK Metal in Faridpur. At the national level, a total of six interviews were conducted with three companies: ACI Motors Ltd., RFL and The Metal Pvt. Limited. In

Photo 7: Interview with RFL (a Notional Private Company) in Barisal. Photo credit: mSTAR Bangladesh

addition, a total of five interviews were conducted with three MFIs: TMSS, Wave Foundation and SDC, as well as interviews conducted with two banks: Bank Asia and BRAC Bank. The interviews covered existing financial support provided from GOB, methods of accessing support to farmers, future promotional planning for the mechanization sector, thoughts on group loans, and any other relevant suggestions. The following sections presents the key discussion points made by these stakeholders.

2.4.1 Existing financial support

A. *GOB*

Increased subsidy from 30% to 50% all over the country and 70% for disaster prone areas for reapers and PTOSs. Beside this, BDT 5,000 (US$ 62.5) is provided as a training allowance to participants who will receive training on mechanization. To access the irrigation service smoothly, BDT 400 (US$ 5) was provided to the farmers during the boro rice season.

B. *MFIs*

Of the three, one MFI was providing a 12% interest rate for agriculture technology loans. The other two have 20-25% interest rates. However, all MFIs reported having flexible (i.e. monthly, periodic or seasonal) repayment tenure facilities for LSPs and farmers. One MFI also reported that they have different types of credit products for farmers and provide certain percentage rebates in case of early settlement.

C. *Local companies*

The two interviewed companies offered sales on one to three-month credit with no interest rate to dealers. All reported that the reduced VAT policies of GOB resulted in accelerated business and imports of technology parts. RK Metal from Faridpur mentioned that "If ASA or any other NGO comes forward to support farmers with loan[s] then more farmers will be willing to buy agriculture technology."

D. *National companies*

Three interviewed companies shared that they provide credit sale to dealers for large value technologies, such as tractors and power tillers. Otherwise, there is no regular support provided to dealers and LSPs. They also shared that due to GOB subsidies they saw increased business.

E. *Banks*

The two banks interviewed noted that at this moment they are not offering any financial products particularly for agricultural mechanization. Nevertheless, BRAC Bank shared their piloting experience in collaboration with one private company. During the pilot, BRAC Bank provided loans to purchase agricultural technologies from that private company, but they confronted difficulties collecting money from LSPs, and did not continue supporting this pilot.

2.4.2 Existing technical support

A. *GOB*

Financed Upazila-level trainings for farmers and LSPs through DAE to enhance their know-how on operating technology. The GOB started providing a 21-day mechanics training. After completing the

training, participants receive BDT 5,000 (US$ 62.5) along with a set of agricultural technologies, which contain a mini combine harvester, reaper, PTOS, power thresher and rice transplanter. This set of agriculture technologies was provided to a group that will be organized by the GOB at Upazila level. Moreover, a mechanized interactive model school and technology service points will be developed at the Upazila level through which farmers and LSPs can service their technologies and access information. The GOB is also thinking about developing farmers' co-operative for cultivation practices on large farmland.

B. *MFIs*

Two MFIs shared their plans to provide training on mechanization in collaboration with private companies. The other MFI shared that they are working with private companies to develop an enterprise or hub to provide after-sales service. Although MFIs provide trainings to community members in groups, they have no plans to provide group loans as they are perceived as being hard to manage.

C. *Local companies*

They provide hands on training to dealers' technicians so that they can help farmers locally. Moreover, these companies shared that they make referrals to MFIs they have a relationship with for suitable credit lines for customers if they need financial support. One local company shared that they also modified technologies as per farmer's needs.

D. *National companies*

Two have an understanding with MFIs to assist the training on usage of different agricultural technologies to LSPs and farmers. However, they do not offer direct support or any group based service due to limited resources, time and business focus.

2.4.3 Transaction methods

A. *MFIs*

All transactions are cash-based. One MFI shared that if the loan amount exceeds BDT 200,000 (US$ 2,500) the transaction is made through cheque. An SDC official from Faridpur mentioned that "through iDE facilitation, we have opened a new sector to provide loan[s] to the farmers. If the loan collection process come[s] through [a] card system, then we will be able to make the process easier."

B. *Local companies*

Transactions with dealers are done via bank account and with LSPs and farmers it is cash-based.

C. *National companies*

Transactions are made through the company bank account. In case of remote areas, the company's marketing officer collects money with a receipt and deposits it in the bank.

2.4.4 Awareness raising activities

A. *GOB*

Trainings and demonstrations are used to motivate farmers to cultivate large farmland instead of small, fragmented land, which is more effective for using technology. Beside this, GOB has plans to establish an agri-technology quality test lab to certify technologies and develop trust among consumers to adopt these new technologies.

B. *MFIs*

Two MFIs shared that they will provide training in collaboration with private companies for LSPs and farmers to teach them how to operate the technologies and the benefits of using them. One of interviewed MFI shared that they have plans to organize a trade fair that will enhance knowledge of the impact of using different technologies.

C. *Local companies*

They provide field demonstrations for these technologies.

D. *National companies*

All interviewed companies did field demonstration for different technologies during the season. For example, AFPs and seeders during the cultivation season and reapers during the harvesting season. One interviewed company shared that they did video demonstrations and road shows to promote these technologies. All companies shared that they did demonstrations led by the company's technician to train dealers' technicians.

2.4.5 Promotional activities to increase sales and acceptance of technologies

A. *MFIs*

One MFI has a plan to offer free servicing for farmers and LSPs through the repayment tenure for those who accessed a loan from that MFI. One other MFIshared that they have plans to work with local engineering companies to manufacture the technologies to bring them within the purchase capacity of farmers and LSPs. During interview, one MFI mentioned not having any plans for such activity.

B. *National companies*

They distribute T-shirts and other promotional giveaways. They also offer sales on credit to dealers for specific technologies. Company 'service van' visits areas for support after purchase of equipment. One company started working to establish agri-technology hub for after-sales service.

3

RECOMMENDATIONS

3 RECOMMENDATIONS

Based on the assessment findings, this section provides recommendations for suitable DFS products in the agriculture mechanization value chain. It includes suggestions for specific actors, such as farmers and LSPs, as well as opportunities to digitize transactions between actors. This is meant to be a starting point from which financial service providers, national and local companies, development organizations, and other interested parties can explore further on their own.

As per the targets of the GOB in its Agricultural Mechanization Roadmap 2016, this sector could see significant growth over the next few years and beyond, making it an interesting market segment for digital financial service providers to consider targeting. By 2021, the GOB's vision calls for fairly exponential growth for mechanization, with more than 1,875,000 more non-deep irrigation pumps, more than 350,000 more PTOSs, and an additional 75,000 reapers (as compared to May 2016 figures).

3.1 Savings

It has been generally observed that farmers and LSPs make an effort to save money in order to mitigate any crisis during crop cultivation. The findings revealed that their savings is dependent on their income and available cash on hand. Most farmers (60%) and just under one-third (29%) of LSPs mentioned they have no ability to save regularly through formal financial institutions and cited the distance of bank branches as one of their reasons for not having a bank account. Thus, if farmers and LSPs could access more flexible savings schemes through DFS, allowing them to save money monthly, seasonally, or in any other flexible mode, it could be a convenient way to enhance their savings behavior and ensure a good return on investment after the maturity of such savings schemes. Loans could also be offered against savings deposits with low yearly interest rate, which could give farmers and LSPs access to lower value financing

when needed. Compared to opening a typical branch-based bank account, the account opening process through DFS, particularly MFS, is much easier in terms of the paperwork and travel required which should reduce the barriers to entry for farmers and LSPs. Savings accounts through agent banking tend to have interest rates ranging from 1.5 to 4%, while for savings schemes it ranges from 7 to 8%, which is more beneficial than storing savings interest-free at home.

3.2 Financial Credit Product Design for LSPs

As previously mentioned, most farmers reported that they usually receive mechanization services on the same day or by the next day after requesting it. However, during the peak season, farmers need to notify LSPs at least three to five days earlier. A few farmers from Khulna and Narail districts also mentioned that sometimes it can take as much as 15 days to receive services after placing a request. Thus, it shows that there is some imbalance between the supply and demand. It is worth mentioning that a few LSPs showed interest in purchasing more agricultural mechanization technologies, in addition to their existing technologies, but they could not afford to do so. These cases indicate that LSPs need additional financial support to expand their businesses and serve farmers more efficiently.

> ***"We need a seasonal working capital facility and it would be better if we could get it at lower interest rate"***
>
> ***PTOS LSP, Magura***

Considering LSPs' income trends, working capital requirements, initial investment/capital expenditures and other operational expenses, we have proposed the design of a potential financial credit product with the following indicators and features. Note that loan products were only considered for PTOSs and reapers, since the price of AFPs is low (BDT 15,000 to 22,000, US$ 187.5 - 275) and is likely not lucrative enough for commercial banks.

Table 14: PTOS and Reaper Loan Product

PTOS AND REAPER LOAN PRODUCT

Indicators and Features	Details	Remarks
A | LOAN TYPE, CEILING, INTEREST AND OTHER CHARGES OF LOAN/LOAN COSTS/FEES		
Loan Type	Consumer credit (agricultural loan)	LSPs do not have any trade licenses and thus they will only be eligible for consumer credit. The technologies shall only be used for agricultural purposes thus this is considered an agricultural loan.
Loan Range	BDT 30,000 to BDT 150,000 (US$ 375-1,875)	After the GOB subsidy of 50%, LSPs usually pay around BDT 75,000 to BDT 85,000 (US$ 937.5 – 1,062) for reapers and BDT 85,000 to BDT 95,000 (US$ 1062 – 1187.5) for PTOSs. Without the GOB subsidy, the reaper price is between BDT 150,000 and BDT 170,000 (US$ 1,875 - 2,125) and the PTOS price is between BDT 170,000 and 190,000 (US$ 2125 – 2375). The price of only the seeder attachment is between BDT 35,000 and BDT 45,000 (US$ 437.5 - 562.5). This assumes that financial institutions will offer a maximum of 80% of the total price of any technology.
Purpose	Fixed asset finance, purchasing mechanization technologies	Only available to purchase technology as LSPs need financial support while purchasing technology and not for working capital.
Loan Tenure	2 to 3 Years	From the ROI calculations of PTOSs and reapers purchased using GOB subsidies, both technologies were profitable by the end of the first year or in the second year of service. Without GOB subsidies, they do not see return on investment until the end of the second year or in the third year of service.
Interest Rate	Agricultural loan interest rate (existing ceiling is 10%)	Interest rate ceilings are subject to change based on the guidance of Bangladesh Bank.
Additional Fees	None or minimal	To drive demand, it would be wise to not charge any additional fees, such as processing fees, loan application fees and risk fund fees, particularly given the financial capacity of LSPs.
Repayment Mode	Flexible repayment option, twice a year	Usually PTOS and reaper LSPs enjoy two peak seasons in a year. Outside of that, they have limited additional income generating activities. Therefore, the repayment schedule should be aligned to their seasonal income. Financial institutions can also think about some grace period for LSPs.

Repeat Loan	May be allowed if installment repayments are made amounting to at least 80% of the total loan amount within the repayment tenure	Based on the survey findings, LSPs want to purchase other technologies to expand their business. In those cases, repeat loans may be considered. Bangladesh is a natural disaster-prone country and thus 100% timely repayment of the installments may not always happen.
B | FINANCIAL PARAMETERS AND SERVICE ACCESS CHANNELS		
Loan to Price Ratio	Loan amount should not exceed 80% of the purchase price	LSPs should have some financial investment in addition to bank's investment to ensure their interest in the business.
Debt Burden Ratio (DBR)	75% of perceived seasonal net income from technology	As this group of customers usually has limited or no access to formal financial services, it would be difficult to compute the exact income of LSPs. Thus, the only way to determine this is to look at data from existing mechanization LSPs and calculate perceived income.
Service Access Channel	Digital financial services (DFS), particularly agent banking	Considering the loan size, loan application process and rural location of LSPs, an agent banking channel is the best fit.
Method of Loan Disbursement	The loan amount could be credited to the supplier's or dealer's account from where the LSP has decided to purchase the technology	This shall ensure that the loan is used solely for its intended purpose to purchase agricultural technologies.
C | ELIGIBILITY		
Experience	Number of years of farming experience (approximately 3-5 years)	LSPs should have proper knowledge of agricultural activities while operating the technologies. One way of verifying this is to explore whether the union chairperson or other local government entity can issue a certificate verifying the experience of LSPs. This would be similar to income testimonials that Union Parishads offer.
Productive Land	Ownership of certain amount of productive land (approximately 100 – 200 decimals) (0.40 – 0.80 hectares)	LSPs should cultivate their own land to ensure that they can repay at least a significant portion of the loan installment from agriculture production, in case of limited mechanization business in a given season.

D | SECURITY (AS APPLICABLE)		
Personal Guarantee	Personal guarantees of relative or dealer	To make the loan application stronger, LSPs can assign any of those listed guarantees for the loan.
Post-dated Cheque	Post-dated cheques for installments	This shall allow financial institutions to take legal action against LSPs if they fail or decline to repay the loan. It shall also provide comfort to the financial institutions offering the loans.
E | MISCELLANEOUS		
Insurance	Vehicle insurance along with life or health insurance	These can be bundled with the loan to give extra motivation and confidence for the LSPs.
Savings	Any savings scheme	A savings scheme can be bundled with the credit to habituate LSPs with quality savings services, as well as to create a digital transaction history to ensure future access to formal financial services like credit without any hassle.

The authors of this report believe that the above product shall perform at its best if the following factors are taken into consideration:

- Loan processing times should be reasonable, taking no more than 10 days. LSPs typically have access to these types of financial support through MFIs where processing times are significantly faster than banks. A more competitive processing time may play a crucial role in driving uptake of this product.
- Loans should be offered before the peak season starts. For reapers, peak season usually starts from November and for PTOSs it is December. Peak seasons are very important to LSPs as they earn the bulk of their income during that period, which also makes it easier for them to repay the loan after the season ends.
- Customer understanding of the service is very important. From recent pilots on DFS-enabled micro-credit solutions with *IFIC Bank* and *Bank Asia*, it was observed that farmers had difficulty in fully understanding the loan requirements, as well as a limited awareness of how to use the products and digital channels.

3.3
Opportunities to Digitize Transactions in the Mechanization Service Value Chain

For the purposes of this assessment, the transaction relationships and patterns observed during the field assessment are presented from the perspective of the key market actor who initiates the payment. The table below thus depicts the key relationship that the actor has with other mechanization players, their transaction behaviors and methods, and finally provides remarks on where the authors think digital financial services can be introduced.

The following table provides the key financial relationship between farmers and LSPs only as it relates to availing agricultural mechanization services. Farmers also require additional labor support during peak seasons and 80% of the farmers reported hiring additional labor. The modality of the payment for workers is mostly cash. Transaction patterns with actors outside the mechanization chain, such as loans and saving deposits, are also recurring and those are mostly dependent on seasonal expenses and income. For more understanding on how DFS could be integrated more broadly within agriculture value chains in Bangladesh, refer to the *Integrating Digital Financial Services into Agricultural Value Chains: A Bangladesh Market Landscape Assessment report.*

> ***"We have limited options to use digital payments. If farmers, dealers and companies start using digital payment services then we will have the option to use it more."***
>
> ***Reaper LSP, Narail***

KEY: Possibility of Introducing DFS

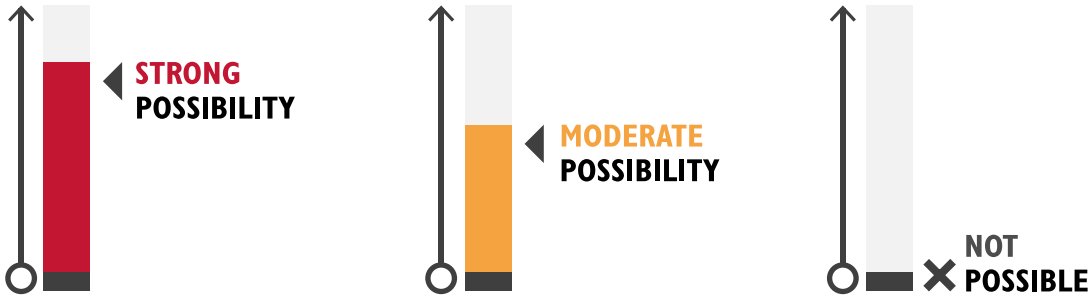


Table 15: Transaction Flow – Farmers

RELATIONSHIP WITH ACTORS	TRANSACTION METHOD	AVERAGE TRANSACTION SIZE AND PAYMENT MODE	POSSIBILITY OF INTRODUCING DFS	REMARKS
LSPs	Require mechanization services for land cultivation and harvest during the season only. Pay mostly in cash except for AFPs where the modality is usually crop sharing. Purchases on credit are settled after the harvest. Of the farmers covered during this assessment, almost all of them access services from LSPs on credit	For PTOSs, the maximum was BDT 4,000 (US$ 50). The payment is done in cash		**PTOS and Reaper:** Farmers usually request services from nearby LSPs. It has been noted that they meet frequently thus they mostly pay in cash. However, it has also been noted that more than 35% of the farmers need to travel to the LSP to make payment, which costs around BDT 10 – 100 (US$ 0.12 - 1.25) and takes anywhere from 15 minutes to 2 hours. Due to this and the small ticket size, MFS can possibly be introduced. This will eliminate the potential risk of losing money through theft and will also save the time and cost associated with travel. Note, while introducing MFS at this point is something to be explored, as the percentage of the farmers that need to travel to make repayment is low, there is not a strong likelihood that farmers would utilize MFS to make payments to LSPs
		For reapers, the maximum was BDT 7,200 (US$ 90). The payment is done in cash		
		For AFPs, mostly paid through crop sharing		**AFP:** As farmers mostly pay through crop sharing, there is no scope for introducing DFS

The following table provides the key financial relationship for the LSPs and dealers. LSPs also require additional labor support during peak seasons, but as most of them employ their family members, the modality of the payment is unclear. Another main cost for LSPs is the fuel that is required for each technology. There is a travel cost and time associated with getting the fuel, however, the modality of the transaction requires LSPs to visit the location meaning introducing a digital finance channel may not be a good option. While most shops that LSPs purchase fuel from are unlikely to accept digital payments, if the local shops accepted mobile payments, then MFS may be a better option than paying in cash, as it will reduce the risk of theft while traveling. Transaction patterns with actors outside of the mechanization chain, such as loans, saving deposits and utility payments are also recurring.

Table 16: Transaction Flow – LSPs

RELATIONSHIP WITH ACTORS	TRANSACTION METHOD	AVERAGE TRANSACTION SIZE AND PAYMENT MODE	POSSIBILITY OF INTRODUCING DFS	REMARKS
Dealer/ Local company	All the transactions were made in cash. As a result, they are required to carry cash with them while traveling to purchase technologies from dealer points. An advance is required in some cases, with informal credit facilities available in a few cases. These credit facilities are based on mutual understanding and trust between the two parties and there is no formal contract. The maximum repayment period of such credit offerings is within 2 - 3 months. In most cases, if there is no credit agreement then the balance is later settled on delivery day	For AFPs, the maximum payment on delivery is BDT 11,000 - 17,700 (US$ 137.5 - 221), with a maximum BDT 12,000 (US $150) paid later. All transactions are made in cash		Agent banking can be introduced for all these three technologies as the transaction sizes are not suitable for the MFS channel. This will enable LSPs to get acquainted with the formal financial sector. In addition, banks can use their digital transaction history to develop credit and/or savings products for LSPs. This will also ensure safety and decrease the propensity of theft. Dealers usually allow LSPs to make payments within 2 to 3 months of purchasing the technologies. Of the LSPs surveyed, 89% mentioned that they had to travel to make these payments. The furthest travel recorded was 35 kilometers' roundtrip, which cost around BDT 400 (US$5). Therefore, introducing agent banking may help mitigate such challenges and costs
		For reapers, the maximum payment on delivery is BDT 150,000 - 170,000 (US$ 1875 - 2125), with a maximum BDT 70,000 (US$ 875) paid later. All transactions are made in cash		
		For PTOSs, the maximum payment on delivery is BDT 65,000 - 190,000 (US$ 812.5 - 2,375), with a maximum BDT 60,000. (US$ 750) paid later. All transactions are made in cash		

The following table provides the key financial relationship for the dealers. Dealers also require additional labor support and the modality of the payment is monthly and mostly in cash. Considering the payment ticket size and the location of dealers' stores (mostly in haat or bazaar areas), agent banking may be a good channel to explore. Transaction patterns with actors outside the mechanization chain, such as loans, saving deposits and utility payments are also recurring, and could also present an opportunity for digitization.

Table 17: Transaction Flow - Dealers

RELATIONSHIP WITH ACTORS	TRANSACTION METHOD	AVERAGE TRANSACTION SIZE AND PAYMENT MODE	POSSIBILITY OF INTRODUCING DFS	REMARKS
Local or National Companies	Dealers usually deposit cash into the company's designated bank account, or they do an online transfer.	The average transaction size is usually more than BDT 100,000 (US$ 1,250).		It is highly recommended to introduce agent banking. This is because one of the main challenges raised by dealers is the inconvenient timing of banking hours. Agent banking can reduce this challenge and will provide a much more convenient channel for the dealers. Once dealers have agent banking accounts they will be more likely to want to accept payments from LSPs via agent banking.

3.4 Small loans for farmers

Small loans, ranging between BDT 10,000 – 20,000 (US$ 125-250), could be offered through the DFS channel for farmers to help them to pay for mechanization services upfront in cash. Just under half of the LSPs surveyed (47%) mentioned that they provide service on credit and farmers also mentioned that they accessed services on credit due to lack of cash. Many farmers reported having a credit line with MFIs and/or Bangladesh Krishi Bank, although they are not using this to pay for mechanization services. They also reported dissatisfaction with the high interest rates of these credit sources, although they were unaware of more competitively priced alternative options. In addition, farmers reported that they try to repay their loan dues immediately after harvest by selling their crops, which generally results in lower prices, particularly of rice, due to the high supply in the market at that time. While most of the LSPs surveyed would not offer any financial incentive to farmers who paid in cash at the time of service, a few said that they would provide a discount of between 5 – 10%. Thus, in some instances, small working capital loans provided through the DFS channel that are sufficient to cover the costs of agricultural inputs and mechanization costs could be an attractive option for some farmers. However, given that farmers are habituated to not paying for mechanization services upfront, some education may be needed to show them the potential benefits of taking credit to do so, particularly if they are able to negotiate discounts.

3.5 Other considerations for DFS products

Revised pricing structure: Respondents expressed their concern about the existing pricing structure, which they felt is high. They shared that a lower pricing structure and slab-wise cash out fee—where charges would be lower for higher ticket size transactions— will encourage DFS adoption among rural people, especially farmers and LSPs. LSPs and dealers felt that a cash out fee of BDT 5 – 10 per BDT 1,000 was reasonable. DFS providers may

also want to think about plans that charge monthly, biannual, or annual subscription fees for multiple transfers for high value customers, as these sorts of recommendations from wholesalers and collection agents within agricultural value chains were found. More on these findings can be found in the *Integrating Digital Financial Services into Agricultural Value Chains (AVC): A Bangladesh Market Landscape Assessment report.*

Incentives for Digital Payments: Incentives such as cash back offers or discounts on digital payment purchases might make use of such services more attractive to farmers and LSPs. DFS, particularly MFS, providers have already been offering incentives such as cash back and discount offers to their customers for some time now, but mostly in urban areas, and they may want to think about offering those in rural settings as well.

Exploring more security options: Farmers and LSPs shared that security options should be multilayered to avoid fraudulent activity. A majority of farmers (76%) and LSPs (53%) preferred biometric-based transactions, based on their belief that fingerprints are much hard to copy than a PIN, which could be disclosed. On other hand, 24% of farmers and 47% of LSPs preferred PIN-based security as it is easy to remember. Some of them also felt that fingerprints might cause problems in the future as they assumed that if their fingerprint is recorded it could be misused by someone else, such as what happened in the *recent Airtel case.* In addition, the fingers of manual laborers, like rickshaw pullers and farmers, can be worn flat over time, which can impact the ability of biometric readers to recognize them.

DFS literacy and awareness: From the survey, it was observed that a large group of respondents are aware of MFS, but have never used them, while very few were aware of agent banking. For those who are aware of MFS but do not use them, this is often because they do not feel it is useful for them, as they have a very limited understanding of the services available. Those who have used MFS mostly did so to cash in and cash out in association with transferring funds. Farmers often do not see a need to have a bank account, as they usually tend to money they have at home or through informal channels, like cooperative societies and local MFIs. These savings are generally kept to invest in future agricultural activities in the next season and to meet any emergency family requirements. They often do not understand the benefits that saving in a formal financial account would have. Therefore, financial literacy, including proper understanding of DFS uses, are extremely important for DFS providers to focus on. mSTAR/Bangladesh has developed numerous learning documents, such as tipsheets and manuals, that may be helpful to support efforts to increase understanding of DFS. Those can be accessed online *here.*

3.6 Digitizing the subsidy reimbursement process

Presently, LSPs and farmers need to acquire an approval certificate through the DAE to purchase the technologies at a subsidized price. That is then submitted to the dealer, who submits it to the national companies, who in turn submits the claim for the subsidized amount to the GOB. Private companies reported difficulties collecting all the approved certificates from the dealers in order to make their claims. It usually takes 7 – 10 days to collect the certificates from the dealers and another 10 – 12 days to receive payment from the GOB. While the full process could be digitized, it would take time to do so and to implement it effectively. However, to ease the process, a digital voucher or token with a unique code could be introduced through the DAE that LSPs/farmers would receive against their application. They could submit this to the dealer to purchase

the technology at the subsidized price. The dealer could then send that voucher code along with private company name to a specific short code using SMS. The DAE would have access to all the information sent from the dealers and reimburse the payment to the respective private companies' bank accounts accordingly. Private companies could also have access to details related to them that dealers send to the DAE short code, so that they can be aware of each subsidized sale through their distribution channel. This would likely be more time efficient and reduce the hassle of paperwork, including the risk of lost paper. One example to look at is a pilot done in Malawi to introduce e-vouchers for the government's input subsidy program. You can learn more about that effort in the publication, *Results of the FISP Malawi e-Voucher Pilot*, May 2014.

3.7
Integration with other value chain actors

It was observed during the assessment that one of the reasons for limited use of DFS is the limited number of transaction options with relevant value chain actors. Some of the interviewed LSPs suggested that if relevant value chain actors, like farmers, dealers, and private companies used DFS, they would be more likely to transact through DFS as well. Small credit and customized savings products might encourage some of those value chain actors to begin using DFS. Some of those opportunities for DFS can be found in this *infographic.*

3.8
Increased awareness of mechanization

A partnership between the GOB and private sector could be initiated to support increased awareness of mechanization. During the assessment, two government officials mentioned that initiatives such as training at the rural level need to be implemented to raise awareness on how to use the technologies as well as why they are needed. They shared that private companies should step forward to enhance the knowledge of farmers and LSPs on how to use and maintain the technologies by training them with their expert technicians. In addition, the one Upazila Agriculture Officer interviewed shared that while visiting Barisal, she saw an onion field that was cultivated entirely by laborers. If the farmer used a PTOS, it would have been cheaper and faster. However, as private companies usually have limited capacity and network outreach, partnering with government institutions, which tend to have more robust local networks, can help to create more awareness and promote mechanization among farmers.

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