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MOBILE SOLUTIONS TECHNICAL ASSISTANCE & RESEARCH PROGRAM (mSTAR) BANGLADESH

Technical Assistance Report

TA RECIPIENT | Rice Value Chain (RVC) Project, IRRI Bangladesh

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The authors hope that this assessment report will be useful for IRRI Bangladesh and any other development projects having similar working focus and interested in incorporating mobile financial services in agricultural value chains—both rice and otherwise.

Executive Summary

The Rice Value Chain (RVC) project is a 15-month pilot project run by the International Rice Research Institute (IRRI) Bangladesh to support the private sector with the goal of improving the efficiency of the rice value chain. RVC is working through eight partners and the intervention areas are mostly in the south and southwest of Bangladesh. The mSTAR/Bangladesh team received a technical assistance request from IRRI Bangladesh to investigate the transaction flows between various value chain actors in the rice value chain and also to look at whether and how mobile financial services (MFS) can be appropriately integrated into payment streams within the rice value chain in order to create more efficiency and transparency. The assessment included feedback from farmers, input retailers and other forward market actors within the rice value chain and was conducted in Jessore and Barisal, within the Feed the Future (FTF) zone.

The assessment captured some basic demographic information about the respondents such as age, sex, educational attainment, and also mobile ownership and access to mobile technology. The assessment also tried to map out all the value chain actors in the rice value chain in various stages of the product lifecycle. The actors identified were input retailers, input dealers, farmers, collectors, millers, large scale traders, commission agents, wholesalers, retailers, and then the final consumers. For all of the actors, their buying and selling behavior was analyzed and it was seen that transactions are mainly cash based, with credit extension very common among the actors. Use of the banking channel was also noticed for large value transactions and when there was significant geographical distance between the transacting parties.

Besides mapping the transaction flows within the value chain actors, the assessment looked into other aspects of financial behavior of the actors as well, such as their savings and loan-related behavior. Banking services and micro-credit facilities have reasonable reach in the rural areas, although many farmers still remain unbanked through formal financial institutions. It was also seen that microfinance loans are easier to avail than bank loans but the repayment terms do not often align with the financial cycle of many of the actors. Informal sources of funds are easier to obtain but they can be very costly. Some middle level actors were seen to be quite connected to the banks since many of them have bank accounts (current account) for making business transactions and also avail overdraft loan facilities from banks.

A look at the awareness and usage of MFS among the value chain actors revealed that awareness levels are high among the actors and the usage rate is satisfactory. However, usage is mostly through agents and use of own wallet was seen to be quite low. The purpose of using MFS was also restricted to mostly person-to-person (P2P) transactions for personal use, rather than for making transactions with buyers or sellers. A closer look at the frequency of use also revealed that most users used it for emergency purposes or on an ad hoc basis and MFS is not really an integral part of their regular transaction channel. The respondents candidly expressed their views regarding MFS and, although they are quite aware of the convenience it offers through the instant transfer of money from one place to another, they voiced some concerns. Most respondents seemed to think that MFS is still quite expensive and not yet feasible for them to adopt for all their financial transactions, although this is mostly due to misinformation about actual wallet-based pricing structures given the high use of over-the-counter transactions. Another important observation was that since most of the value chain actors in the upstream and midstream segment of the chain are situated close to each other, the full benefits of transferring money through MFS are not realized. Respondents noted that MFS is not currently economically viable for them; however, some MFS usage for

transacting with business partners was seen when they were situated farther away and it made more sense to transact through MFS rather than spending considerable time and money on the journey to make or receive payments. Field observations found that access to MFS agents is not an insurmountable challenge since agent networks have spread rapidly and are available in most of the Union level markets.

Despite these findings, we did identify significant potential scope for integrating MFS into the rice value chain and suitable recommendations for doing so were put forward. Specific MFS accounts suitable for specific actors were identified and recommended payment streams for the value chain actors were constructed. In addition to recommendations for each of the actors, some broad recommendations are also provided that are pertinent for IRRI and MFS providers to delve into. The overarching objective is to push for development of an MFS ecosystem within the rural setting, which will by default propagate the use of MFS in the rural economic sphere.

The final area of exploration was to observe the flow of funds within the operational activities of IRRI and within its partner NGOs. A mapping of the current fund flow was constructed and the bottlenecks were identified. Based on appropriateness and consideration of time and cost savings, a proposed fund flow was put in place that would smoothen the cash flow as it moves downstream. Cash transactions were replaced by transactions through MFS in streams where it would provide increased convenience and security. Some other recommendations such as digitizing the discount coupons through which farmers are receiving subsidies can also be discussed for future assessments.

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1. Introduction

1.1 Overview of the Rice Value Chain Project

The Rice Value Chain (RVC) project is a 15-month pilot project run by IRRI Bangladesh to support the private sector to improve the efficiency of the rice value chain. RVC is working through eight partners. The intervention areas are Jessore, Chuadanga, Magura, Jhenaidah, Khulna, Bagerhat, Satkhira, Faridpur, Rajbari, Madaripur, Barisal, Patuakhali, Bhola, and Barguna.

RVC is promoting select varieties of crops grown in rice-based cropping systems, including fine grained and aromatic rice varieties such as BRRI dhan50 and BRRI dhan34, and high value crops grown in rotation with these rice varieties such as lentil, mung bean, peas, oilseed mustard, and sunflower. RVC works with seed companies and their retailers to make the seeds available to local seed producers who are part of the program. RVC is working through more than 200 farmer groups supporting them to access seeds through training and linking them with markets. The project is experimenting with a group marketing approach in which farmers have developed collection points through which crops are sold to traders. This reduces the transaction costs of traders and should result in higher prices for farmers. The project has to see if those higher prices materialize. RVC will also be working on forward market linkages through which 75 traders will be identified and trained on specific seeds and businesses.

1.2 Purpose and Scope of the Assessment

The mSTAR/Bangladesh team received a technical assistance request from IRRI Bangladesh to investigate the transaction flows between the various value chain actors within the rice value chain. The assessment also examined how mobile financial services (MFS) can be appropriately integrated into payment streams within the rice value chain in order to create more efficiency and transparency. The scope of this assessment also delved into opportunities for IRRI to use MFS within their project activities. The overarching objectives of this assessment are appended below:

- Map cash flows between value chain actors and for each value chain actor
- Understand the financial behavior of various value chain actors of the rice value chain
- Access source of finance of value chain actors
- Awareness and usage of MFS by value chain actors
- Opportunities for integrating MFS in the value chain and potential barriers
- Opportunities for MFS uptake by IRRI in their project activities

1.3 Assessment Design & Sample Size

The assessment was conducted in areas surrounding IRRI hubs in Jessore and Barisal. The mSTAR/Bangladesh team conducted FGDs with the project's beneficiary farmers and key informant interviews (KIIs) with various value chain actors, such as input retailers, collectors, millers, and large scale traders. The details of the sampling frame are appended below:

Table 1: Respondent profile and sample size

Sampling Plan	Data collection Method	Numbers
Input retailers	KII	6
Farmers	FGD (6 FGDs)	6 x 10 = 60
Collectors (*Faria, Bepari*)	KII	5
Millers	KII	5
Arotdars (Commission agents)	KII	2
Large scale wholesalers	KII	3
Total	**81**	

The FGD questionnaires were designed in such a way that both qualitative and quantitative information could be garnered and act as a group administered survey. The KII questionnaires were structured questionnaires with appropriate coding. The collected data then went through rigorous analysis with the use of SPSS statistical software, as well as Microsoft Excel. Interviews with IRRI and partner staff were also conducted both at IRRI's field offices and in Dhaka. A total of nine such interviews were conducted, including three interviews with staff from IRRI partners Jagorani Chakra Foundation and Bangladesh Development Society.

Figure 1: Trader interview in Jhenidah

Figure 2: Input retailer interview in Barisal

Figure 3: FGD in Barisal

Figure 4: A rice mill in Barisal

Figure 5: Trader interview in Barguna, Barisal

Figure 6: An input seller's signboard in Jhenidah

1.4 Geographical Coverage

The assessment was conducted in the areas surrounding the Jessore and Barisal hubs of IRRI Bangladesh. Detailed GIS information was collected from all the data collection areas and a map was drawn to depict those locations. The districts of Jessore, Jhenidah, Barisal, Patuakhali and Barguna were covered during the assessment. The map below depicts the assessment areas:

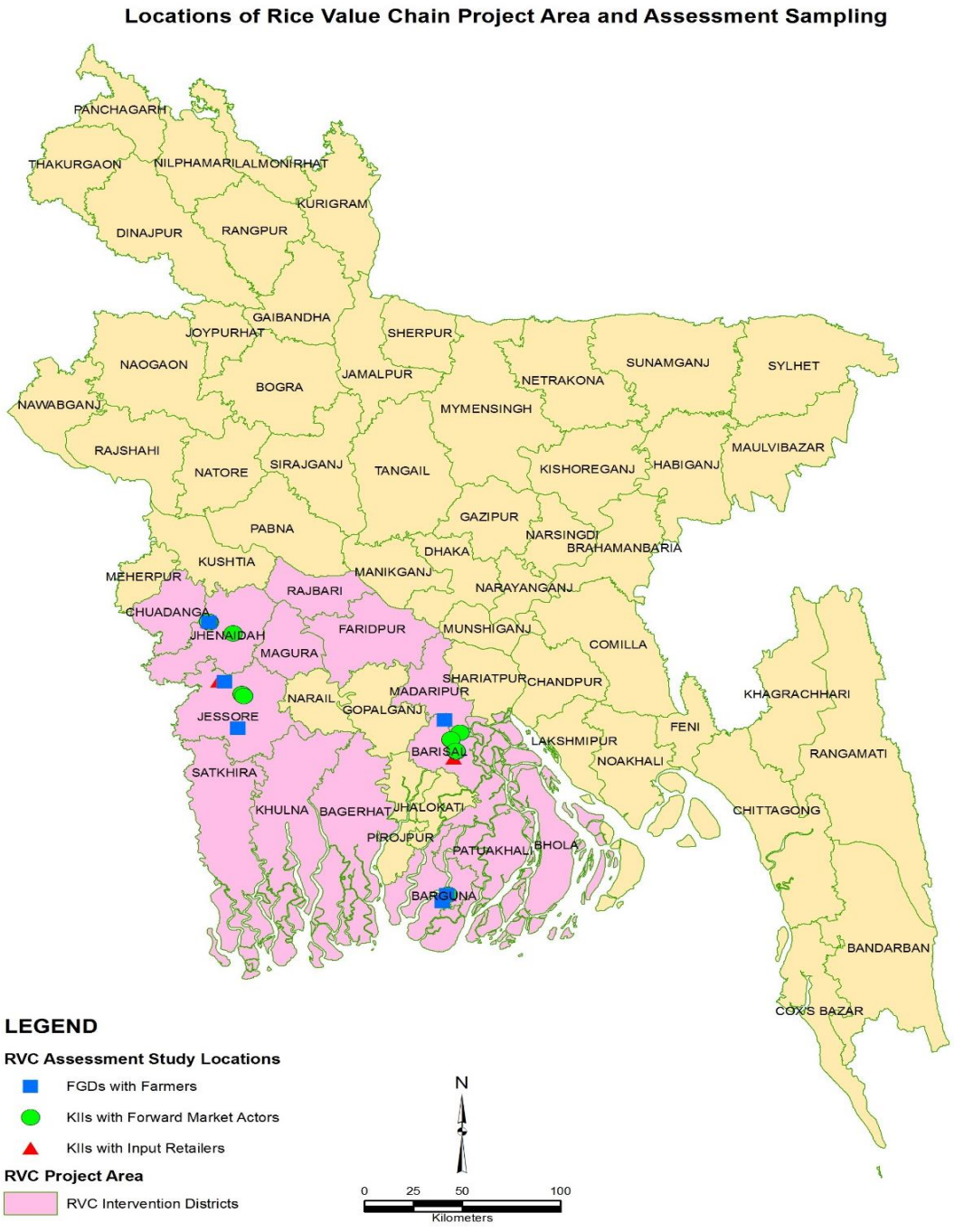


Figure 7: GIS locations of assessment areas

1.5 Limitations

A major limitation of the assessment is the relatively small sample size, especially for the input retailers and forward market actors. Thus, any analysis or comments regarding a specific actor cannot be considered fully representative of that particular actor within the survey regions. The remarks made in this report, especially regarding transactions and the financial behavior of value chain actors, give some idea about a particular actor's behavior, although are not meant to be reflective of all actors. In addition, this assessment primarily looked at opportunities for using mobile financial services, which are only one channel within the broader category of digital financial services. It did not assess opportunities for agent banking, card-based payments or other forms of digital financial services. For a more detailed analysis, a much more comprehensive and larger sample study may need to be carried out.

2. Assessment Findings

2.1 Demographic Information

2.1.1 Farmers

A total of 60 farmers participated in six FGDs as part of this assessment. Out of the 60 respondents, 56 were male and 4 were female. However, it has to be mentioned that women are also heavily involved in rice farming, especially during sowing and threshing, but they don't always portray themselves as rice farmers. Thus, it also somewhat reflected in the composition of the respondents. The following tables provide additional demographic details.

Age

Table 2: Age of respondents

Age Range of Farmers	Number	Percent
Below 30	8	13.3
31-45	27	45
Over 45	25	41.7
Total	**60**	**100**

Educational Attainment

Table 3: Educational attainment of farmers

Educational Level	Number	Percent
Illiterate (no education)	8	13.3
Numeric literate	-	-
Grade 1 – 5	20	33.3
Grade 5 – 10	19	31.7
SSC	8	13.3
HSC	-	-
Bachelor's	-	-

Educational Level	Number	Percent
Master's	5	8.3
Total	**60**	**100**

As seen from the table above, most of the farmers have not studied beyond secondary school. Though, surprisingly in the Jessore region, a group of five farmers reported having attained a Master's degree.

2.1.2 Other Value Chain Actors

For the other value chain actors, only the level of education was collected. All of the other value chain actors that participated in the KIIs were male. It is quite rare to find a female-led input retailer shop in rural communities in Bangladesh, and no such shops were encountered in the assessment area.

Input retailers

Table 4: Educational Attainment of Input Retailers

Educational Level	Number	Percent
Illiterate (no education)	-	-
Numeric literate	-	-
Grade 1 – 5	-	-
Grade 5 – 10	2	33.3
SSC	2	33.3
HSC	1	16.7
Bachelor's	1	16.7
Master's	-	-
Total	**6**	**100**

Forward market actors

Table 5: Educational attainment of forward market actors

Educational Level	Number	Percent
Illiterate (no education)	2	13
Numeric literate	1	7
Grade 1 – 5	4	27
Grade 5 – 10	1	7
SSC	2	13
HSC	2	13
Bachelor's	2	13
Master's	1	7
Total	**15**	**100**

2.2 Mobile Phone Usage

2.2.1 Farmers

At the farmers' level, it was seen that out of the 60 respondents, 88% owned a mobile phone and had a registered SIM card and 10% at least had access to mobile phones. However, one farmer mentioned that he neither owned nor had access to a mobile phone. When asked about the type of mobile phones they used, the vast majority (93%) were using feature phones. An additional two farmers used basic phones and two farmers were using smartphones, albeit lower-end models. Farmers used their mobile phones mainly for making and receiving calls, although some farmers stated that they listen to the radio or take pictures once in a while.

2.2.2 Input retailers

All the input retailers interviewed used mobile phones and had SIM cards registered in their name. Five out of six retailers used multiple SIM cards. All of them owned a GrameenPhone (GP) SIM. After GP, Banglalink and Airtel were the preferred MNOs. Their phone usage pattern is depicted in the following table:

Table 6: Mobile phone usage purpose of input retailers

Phone Use Purpose	Number	Percent
Making & receiving calls	6	100.0
SMS	4	66.7
To check airtime balance	2	33.3
To access the internet	-	-
To play games	-	-
For mobile banking	1	16.7
Listen to music	3	50.0
Listen to radio	-	-
To access news	-	-
To take pictures	-	-

2.2.3 Forward Market Actors

All of the 15 forward market actors interviewed used mobile phones and had SIMs registered in their name, with 60% of the actors using multiple SIMs. Notably, all of them used a GP SIM and dual SIM users preferred Airtel, Banglalink and Robi, alongside a GP SIM. When asked about the usage of mobile phones, the following responses were received as depicted in the table below:

Table 7: Mobile phone usage purpose of forward market actors

Phone Use Purpose	Number	Percent
Making & receiving calls	15	100
SMS	-	-
To check airtime balance	2	13.3
To access the internet	-	-

Phone Use Purpose	Number	Percent
To play games	3	20.0
For mobile banking	2	13.3
Listen to music	1	6.7
Listen to radio	1	6.7
To access news	-	-
To take pictures	4	26.7

From the table above, it can be seen that forward market actors use their mobile phones for a multitude of purposes other than just making and receiving calls. Two of the respondents were also already using MFS to send and receive money.

2.3 Rice Value Chain Mapping

Rice is the foremost cereal in Bangladesh. Bangladesh has an excellent part-tropical climate, abundant water from rivers and a large number of rice farmers. As a result of these conditions, Bangladesh is one of the world's leading rice growing nations. Rice is the staple diet of the country's 160 million population and the per capita rice consumption in Bangladesh is higher than in any other country where rice is the staple. (Bangladesh Rice Foundation, n.d.) Rice is usually grown all-year-round in Bangladesh but, in the study zones of Jessore and Barisal region, it was seen that farmers cultivate rice twice a year. The main seasons of rice cultivation are *Aman* (June-November) and *Boro* (December-April). From field observations, the activities related to rice farming can be mapped as per the following table:

Table 8: Rice crop calendar

Particulars	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Aman Season												
Land preparation												
Sowing												
Growth												
Harvesting												
Selling												
Boro Season												
Land preparation												
Sowing												
Growth												
Harvesting												
Selling												

From primary observation and secondary study, various actors of the rice value chain were identified and the interrelationships between them could be observed as well. The various actors in the chain and their roles are discussed briefly below:

Input sellers- Retailers and dealers selling various type of inputs needed for rice cultivation. The inputs include different varieties of rice seeds, fertilizer, and pesticides. The input sellers are also important information points for farmers regarding various innovations in input products. Farmers also take advice from them on usage methods of particular inputs.

Farmers- They are the central character of the rice value chain. They give their blood, toil, tears, and sweat to produce rice for the whole nation. Even though we term them as producers, they are in essence business people themselves since they are investing in inputs, giving their labor in the field, and also selling their produce for a profit as any entrepreneur would do.

Paddy Collectors- Collectors collect paddy from farmers from different locations, store the paddy, and sell to either other paddy trader with large scale operations or to millers. The value added in paddy trading is through collecting, aggregating, storing, and transporting the goods. Such traders are also called *faria* and *bepari* and are generally part-time, seasonal traders do not have permanent business establishments (Rice value chain assessment and rice preferences of consumers, 2015).

Processors/Millers- Rice is usually processed through parboiling and milling. Parboiling is the hydrothermal treatment of paddy before milling, whereby the rice goes through the process of soaking, steaming, and drying (Rice value chain assessment and rice preferences of consumers, 2015). Rice mills in Bangladesh are generally classified as husking, semi-automatic, and automatic. However, for this study, only husking and semi-automatic millers were interviewed. Millers are businessmen but they can also act as service providers. Village level millers often mill rice for farmers for a charge and the latter would use it for household consumption only. Millers usually collect the rice from rice collectors but, in some instances, they also collect from farmers directly. Some of the collectors also act as agents on behalf of the millers to collect large volumes of rice from the farmers. Processors mainly sell to wholesalers within their districts, as well as wholesalers from other districts and divisions.

Large scale traders- Such traders are active in the major markets and handle larger volumes of rice than rural traders. They usually manage networks of 40 – 50 smaller traders or mills. Much of the rice is destined for the domestic market in other districts or to the major divisional headquarters and the capital.

Commission Agents (*Arotdars*)- Commission agents are traders who deal in bulk quantities of rice and their profit is generated from the commission they receive from selling rice. Traders and millers bring rice to their *mokam* (establishment) where rice is traded. They charge a commission on the total value of rice sold. The going rate of commission was seen to be BDT 13 per bag of rice sold or BDT 13 per 50 kg of rice sold.

Wholesalers- Located in major markets, wholesalers buy rice from traders and store/handle product for a range of end markets, including retail.

Retailers- Retailers are downstream actors who sell rice to final consumers in smaller quantities. Retailers have taken many shapes and sizes. Retailers can be at the village level, at the district city level or

at the big city level. But their common trait is that they sell the rice to the final consumer in smaller amounts. Wherever there are consumers demanding rice, there will be retailers. Even chain shops located in Dhaka and other big cities are also retailers of rice. However, retailers were not interviewed within the scope of this assessment.

Consumers- The final consumers of the rice. They buy the rice for household consumption and in small amounts. Rice consumers were not interviewed within the scope of this assessment.

2.3.1 Rice Value Chain Map

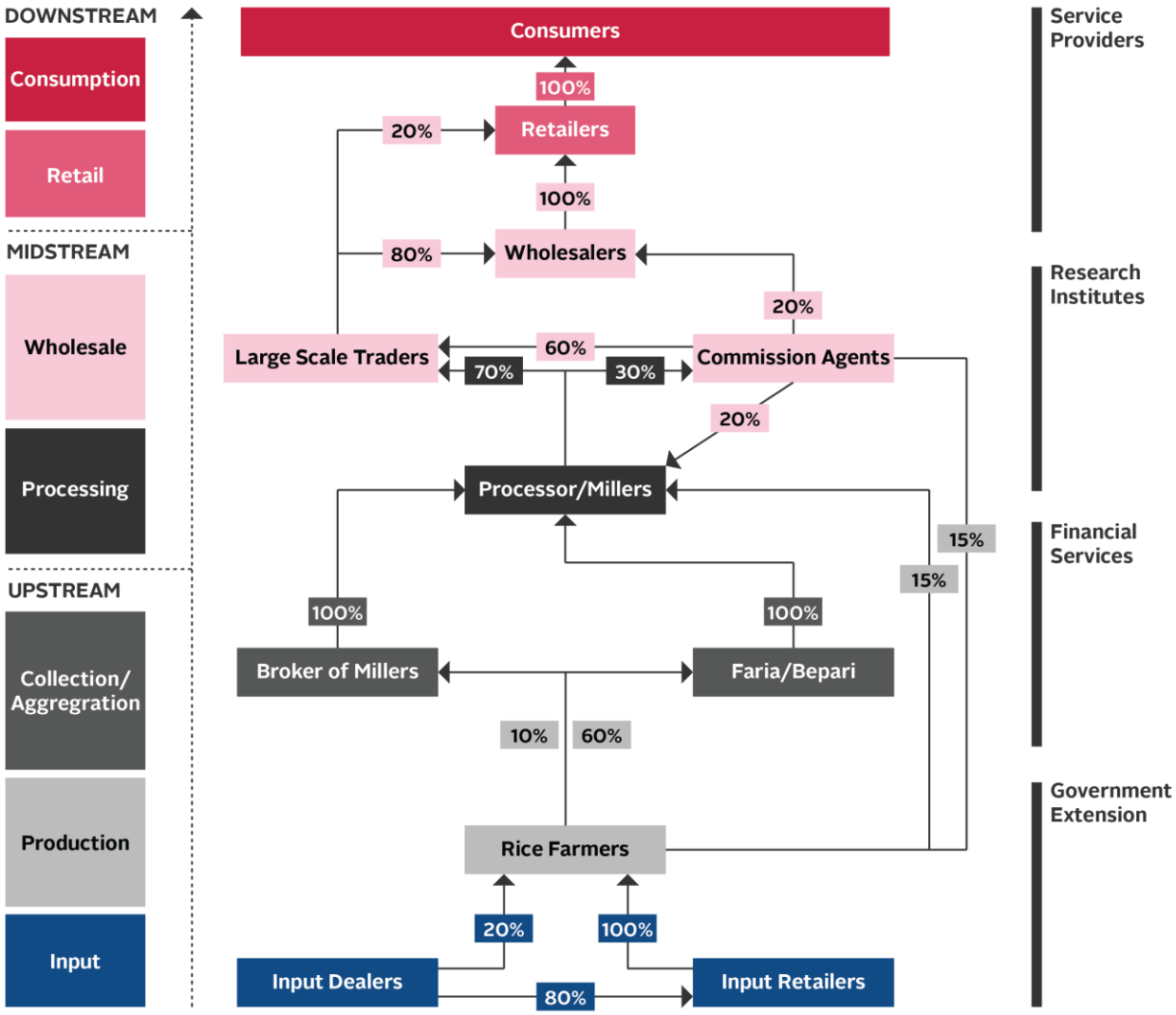


Figure 8: Rice value chain mapping of actors

Note: Percentages denote the percentage flow of goods, not value, to the immediate succeeding actors. Source: primary data through field observation.

The figure on the previous page is a snapshot of the rice value chain. The upward arrows denote the percentage flow of goods from one actor to another. From field observation, it was seen that farmers have to buy various inputs such as rice seeds, fertilizers and pesticides year-round for rice cultivation. They either buy them from small village level retailers, or in some cases from dealers and partner dealers, depending on the volume. After the rice has been harvested, there are a multitude of ways it goes forward to the next channels. In 60-70% of the cases, paddy collectors collect the paddy from the farmer's home after it has been threshed. Some farmers were also seen to be having linkages with local rice mills and they sold the paddy directly to the millers for further processing. Some millers also employ agents or brokers to collect the paddy for them. In essence, they are also collectors but working on behalf of the millers. It was also observed that some farmers sold paddy (around 15%) in weekly market days through commission agents, who in turn sell to millers for further processing.

As for the collectors and brokers, they sell exclusively to the surrounding mills. During the field survey, two levels of collectors were identified. Smaller collectors were called *faria* and collectors with larger trade volume were called *bepari*. Thus, a smaller collector can also sell to a larger collector but for the sake of simplicity, they have been grouped together in this assessment.

The miller enjoys a very central role to the rice value chain, since every grain of paddy has to be milled in order for it to be edible. In our field assessment, it was seen that millers preferred to buy from the farmer directly, with around 80% of them purchasing from farmers. However, this can be attributed to the fact that the mills interviewed were small scale in nature and located closer to the farmers. Millers also employ brokers to collect the paddy for them and they often buy from the collectors of paddy. Millers sometimes also buy paddy from commission agents, since the latter sometimes deals with paddy along with rice. After processing, millers sell it to large volume of traders and also through commission agents.

Large scale traders are inter-district big volume traders who play an important role in the distribution of rice countrywide. These traders are entrepreneurs investing money and taking business risks, unlike commission agents. They buy rice from mills and commission agents, and channel the rice through their distribution network to big wholesale markets within the district of their operations and also to other districts and city markets. They also sell to retailers directly, especially to local retailers. Commission agents, on the other hand, have a fixed establishment called *mokam* where trading of rice takes place. Their profit is generated through the commission they receive on the selling of rice from their *mokam*.

The downstream segment of the rice value chain is comprised of the retailers and final consumers. Retailers could be at the village level, at the district city level or at the big city level. But their common trait is that they will sell the rice to the final consumer in smaller amounts. Retailers cater exclusively to the final consumer of rice in the vicinity of their working area.

Besides the core value chain actors there are supporting and ancillary actors who also influence the activities and performance of the value chain. There are various service providers providing mechanization services to the farmers (power tiller and low lift pump) as well as research institutes (BRRI, IRRI) and

development projects, which directly or indirectly work for the development of the value chain. Furthermore, there are financial service providers such as banks, MFIs, and informal money lenders. The government also plays an important role in the rice value chain through its extension service for agriculture. Besides government extension, NGOs are also working with agricultural extension. The USAID's Agricultural Extension Support Activity (AESA), implemented by Dhaka Ahsania Mission (DAM), is working in 20 districts within Feed the Future's southwest Bangladesh focus area. AESA promotes greater intensification and diversification of high-value commercial and nutritionally-rich crops, and provides market linkages for the sale of quality value-chain products.

2.4 Transaction Mapping of Rice Value Chain Actors

2.4.1 Farmers

The backward actors for the farmers include input retailers and dealers, from whom the farmers buy seeds, fertilizers and pesticides. Farmers also employ service providers for tillage and irrigation services, for which they make payment. They also hire labor during land preparation and also during harvesting and selling. The transaction flow of the farmers with various value chain actors is described in the following table for convenience:

2.4.1.1 Buying of inputs

Table 9: Buying behavior of farmers

Item	Purchased from	Times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchase value (annual avg.)	Payment mode
Seed	• Input retailer-63.5% • Input wholesaler-36.55%	• Jun-Jul for Aman • Dec-Jan for Boro	2.57	BDT 741	BDT 2,373	Cash & credit mixed. Eventually all payments in cash but 38.5% farmers keep credit.
Fertilizer	• Input retailer-50% • Input wholesaler-50%	• Jun-Jul • Dec-Jan	3.41	BDT 2,193	BDT 9,692	Cash & credit mixed. Eventually all payments in cash but 53.3% farmers keep credit.
Pesticide	• Input retailer-52% • Input wholesaler-48%	• Usually one month after sowing	3.34	BDT 575	BDT 3,078	Cash & credit mixed. Eventually all payments in cash but 53.3% farmers keep credit
Tillage	• Service providers	• Jun-Jul • Dec-Jan	n/a	n/a	BDT 6,136	Both cash and credit.
Irrigation	• Service providers	• Throughout the	n/a	n/a	BDT 6,097	Both cash and credit.

Item	Purchased from	Times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchase value (annual avg.)	Payment mode
		cultivation stage				
Labor for land preparation	n/a	• June-July • Dec-Jan	n/a	n/a	BDT 5,115	Partial cash payment and then payment in full within a month in cash.

From the table above, it is seen that farmers need to source most of the inputs during the land preparation and planting stage of the season. The average transaction value while purchasing inputs is quite low. Payments to input sellers are made in cash but often payment is deferred and remains outstanding for 2-3 months. Farmers pay a certain amount upfront and adjust the balance with the input sellers after selling their crop. Payment to service providers such as tillage service providers is also made in the same way (i.e. partial payment made during contract and then the rest of the amount paid after selling produce).

Transport and time calculation while buying inputs

Most of the Farmers mentioned that they have to travel or displace in order to buy the inputs they required. Displacement entails time and money cost. The total time and money cost for farmers while collecting input is depicted in the following diagram.

Figure 9: Farmers' travel and time considerations while buying inputs

From the figure above, we can see that farmers have to travel 7.38 times on average per year to collect their inputs and for each round trip, they have to spend 33.83 minutes and BDT 24.08 for transportation. Thus, the total annual time spent on travelling to buy inputs is 249 minutes or around 4 hours, and the total annual cost of such travels amounts to BDT 177.

2.4.1.2 Selling

After harvest, farmers usually sell their crops after leaving behind what is needed for their own consumption. They usually mill the paddy from local millers and store the rice appropriately for their own consumption. From field observation, it was seen that on average, farmers retain 35% of their produce for their own consumption. The usual harvest time for *Aman* rice is November and December, and for

Boro, it is usually the end of March and April. From the FGD, it was also revealed that farmers try to sell the paddy right after harvest, since they do not have any storage facilities. Thus, they are not always able to sell the paddy at their desired price and, to some extent, forced to sell at the prevailing market rate, even if the price is not desirable for them. Considering last season's selling price, the farmers in the FGDs reported that the *Aman* selling price was in the range of BDT 500-600 per *maund* (40 kg) and for *Boro* it was in the range of BDT 650-750 per *maund*. Disaggregated data of the selling price by buyer was not captured during this assessment. The table below depicts some pertinent details related to the selling behavior of farmers.

Table 10: Selling behavior of farmers

Sell Item	Sell to	Time of Sale	Times sold in year (avg.)	Avg. selling volume per tranche	Per tranche value (avg.)	Mode of Payment
Paddy	• Collector-70% • Miller-15% • Arotdar-15%	• Nov-Jan • Mar-May	3.26	64 mounds	BDT 40,000-BDT 50,000	Mixture of cash and credit. However, 86.5% farmers received deferred payment (in credit) and it was paid later in cash.

Note: 1 maund=40kg

From the table above, it is seen that farmers mostly rely on collectors (*faria, bepari*) to sell their goods. Collectors usually collect the paddy from the farm gate making it convenient for the farmers, even though it is cheaper than selling it to forward market actors. Some farmers also have links with millers in their own vicinity and sell directly to them. Around 15% of the farmers also said that they take their goods to weekly market days in the nearby market and sell the paddy through commission agents (*arotdars*).

Figure 10: FGD in progress in Barisal

Figure 11: FGD in progress in Jessore

When asked about how they received payment, most farmers did not get full payment immediately. Usually partial payment of cash is made and then gradually within a period of 15-45 days their buyers pay them in full with cash payments. For collection of credit, farmers often have to travel to collect the amount due from their buyers and sometimes the buyers also travel to them and settle the due. However, from field

observation, it was seen that 91% of the farmers had to travel to collect their due amount. The total time and money cost for farmers while collecting due amount is depicted in the following diagram.

Figure 12: Farmers' time and travel cost for collecting due money

From the figure above, it is seen that farmers have to travel 3.31 times on average per year to collect the amount due to them and for each roundtrip, they have to spend 24.87 minutes and BDT 10.85 for transportation. Thus, the total cost involved per year amounts to BDT 35 and the time required is 82 minutes or 1.5 hours.

Item for further exploration

Given that the travel costs farmers incur to collect payments are BDT 10.85, it is worth exploring whether they would be open to receiving payment from the buyer via MFS, allowing the buyer to deduct the transfer fee (BDT 3-5) from the total.

Labor requirement for harvesting and selling

Harvest time is a busy time for farmers and during this time, they employ daily wage labor for paddy cutting, binding, and transporting as well as loading to the designated transport vehicle, if required. Since harvest time for most farmers coincide, labor is in high demand during this time and daily wage rates can soar as high as BDT 450 per day. Payment to labor is made in cash right after the harvested paddy has been sold. Thus, there is a credit period of 7-10 days.

2.4.1.3 Perception of farmers with transaction process

Farmers were asked about their perception of the transaction process while they were buying and making payments and their responses were recorded in a five-point scale. The following table denotes their responses:

Table 11: Perception of transaction process (farmers)

Response	Percentage
Very happy	1.7
Happy	80.0
Indifferent	11.7
Unhappy	6.7
Very Unhappy	--

From the table above it is evident that farmers are reasonably happy with their current transaction process for buying. Subsequently, farmers were also asked whether they were satisfied with how they receive their payment after selling their produce. The level of dissatisfaction (20% unhappy) was higher while they were making payments for purchases. After detailed discussion with the farmers, some qualitative observations were noted, which explains the data presented above:

- There is less fear of travelling with cash since farmers do not have to go very far to make or receive payment. Most farmers do not have the fear of getting robbed on the way since they are within their own locality, which gives them confidence. However, if they were to travel outside of their locality such as an Upazilla market or district market; then there is some fear of getting robbed or the money getting misplaced.
- Some farmers expressed minor dissatisfaction with the fact that when they are buying inputs on credit, the retailers charge a little extra as a substitution for interest. Nonetheless, they agree that the input retailers also have to look after their interests.
- Farmers have to travel to collect amounts due to them from processors and traders. Sometimes they do not receive the money back in one tranche but in several tranches, which entails multiple trips. They find this frequent travel to be a big hassle since they have to leave their work in the field to do so. They do not mind giving credit but want to receive payment in a single tranche, if possible.
- Farmers seemed generally content with how things are with their current transaction processes with other value chain actors, although this may partly be due to the fact that they have come to accept them and are not aware of alternatives, such as MFS, that may exist.

2.4.2 Input Sellers

A total of six input retailers were interviewed for this assessment. Input retailers are upstream value chain actors who cater to the farmers in the same locality of their establishment. The input supply model consists of big input companies employing dealers in the division or partner-division level who in turn cater to partner-dealers and input retailers under its area. The Bangladesh Agricultural Development Corporation (BADC) under government extension also employs the dealer-retailer model for fertilizer distribution. Some input retailers maintain liaisons with input companies and source their goods directly from them. For the scope of this assessment, only input retailers were interviewed.

2.4.2.1 Buying behavior

The buying behavior of the input retailers is explained in the following table:

Table 12: Buying behavior of input retailers

Purchased from	Times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchase value in year (avg.)	Payment mode
• Input company-66.7% • Input dealer/partner-dealer-83.3%	All throughout the year in tranches but peaks in certain months	58 times	BDT 55,000	BDT 1,733,333	Mixture of cash and credit which is eventually settled in cash. Incidence of bank transfer and mobile payment was also observed.

Note:

i) Some actors purchased from multiple actors, thus, the total purchase percentage exceeds 100%

ii) The total purchase value per year was collected separately and was not calculated as a multiplication of the number of purchase times and the average transaction size. ***This also holds true for all subsequent tables with similar depictions.***

From the table above, it can be seen that input retailers roll over a handsome amount of money throughout the year and they are continuously buying inputs from dealers and input companies to replenish their stocks. From field observation, it was seen that input retailers enjoy a rolling credit line with their buyers. Generally, they have a six-month period within which they can pay back any amount at any time. Six months after establishing their credit line, they have to clear their dues before another credit line could be initiated for the next six months. One input retailer was found to have transacted through the banking channel (bank transfer to the account of the seller) and one input retailer claimed to have used MFS to transfer funds to his buyer. However, he mentioned that it was not a regular habit for him and he used MFS only when there was an urgency to transfer funds immediately to a buyer who was a relatively long distance away.

Transport and time calculation while making payments to sellers

Buying is mostly credit based and input retailers have to clear their books with the creditors after a certain period of time. Sometimes input retailers have to make the journey to their sellers' establishment to settle the amount due and sometimes sellers' representatives come and collect money from them. Half of the respondents mentioned that they have to travel to settle dues with their creditors. The input retailers interviewed have to make 3-4 trips like this in a calendar year which costs them roughly BDT 50-100 and takes up around 60-90 minutes per round trip, barring waiting time.

2.4.2.2 Selling Behavior

Input retailers cater to both large and small farmers, although large farmers are prone to buying directly from the dealers due to their volume and potential for a better rate.

Table 13: Selling behavior of input retailers

Sold to	Peak times of sale	Avg. transaction size	Total sold in year (avg.)	Payment receipt mode
• Large Farmers 20-30% • Small Farmers 70-80% • Other Retailers 10%	All year sales but peak times are before the cultivation seasons in the months of May-July and November-February	• Small farmers- BDT 1,950 • Large farmers- BDT 6,033 • Other retailers- BDT 27,500	BDT 2,466,667	Partial cash and credit. Credit is later settled with cash.

From the table above we get a glimpse of the selling behavior of the input retailers. The average transaction size with large farmers is also considerably higher than transaction size with small farmers. Input retailers are readily able to sell goods on credit to their customers and they mentioned that it is the norm of doing business with farmers. Farmers are always in cash stress so unless credit is extended to them, they will not be able to buy the required inputs. In most cases, the credit is extended for 3-4 months and farmers usually repay the input retailers after harvest. No instances of payment in-kind (via crops) was noticed during field observation.

Transport and time calculation while collecting due money

As mentioned before input retailers are in the habit of selling inputs of credit and as such from time to time, they have to go for collection of the amount due. Sometimes the amount due is also repaid by the buyer at the shop, so the input seller might not always need to travel. It was seen that input retailers or their representatives have to make 8-10 collection trips like this in a calendar year which costs them roughly BDT 50-70 per round trip and takes up around 40-50 minutes per round trip, barring waiting time. Therefore, the total time involvement per year is around 500 minutes or 8 hours and the total cost involved is BDT 500-700.

2.4.2.3 Perception regarding transaction process

The input retailers were asked about their perception about the current transaction process that they are following for both buying and selling. Their responses are captured in the following table:

Table 14: Perception of transaction process of input retailers

Response	While Buying	While Selling
Very happy	-	-
Happy	66.7%	83.3%
Indifferent	16.7%	16.7%
Unhappy	16.7%	-
Very Unhappy	-	-

From the table above, it is seen that input retailers are reasonably happy with their current transaction process. However, they had some qualitative input while being interviewed, which is appended below:

- Input sellers sometimes have to close their shops while going for collection or making repayments. In such cases, valuable business hours are lost unless they can manage someone to look after their shop. The input retailers interviewed were sole proprietors of their shop and they did not have employees or assistants.
- If their buyers default, then they fall into crash crunch and face difficulties to purchase new products. They are also under some financial stress when they have to settle their accounts with their creditors (dealers).
- They prefer to buy things in credit, even though, they have to pay slightly higher prices if bought on credit. If they pay the full amount immediately in cash then they get discounts on the purchase amount, but since their money is also tied up with various farmers, they cannot muster enough money to pay the full cash amount.
- Input sellers agreed, however, that credit buying and selling is part of business and they accept it even if it is not convenient all the time. This level of resignation may in part be due to the fact that they are not aware of other options, like MFS, that might help them to increase their convenience.

2.4.3 Forward Market Actors

2.4.3.1 Buying behavior

The forward market actors interviewed for this assessment include collectors, processors/millers, commission agents and large scale traders/wholesalers. Their roles and responsibilities have been explained previously under section 2.3. The forward market actors vary in transaction volume and nature, therefore, their behavior has to be analyzed separately. The write up below attempts to analyze the transaction behavior of various forward market actors separately.

Collectors

Table 15: Buying behavior of collectors

Purchased from	Peak times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchased or cost (annual avg.)	Payment mode
• Small farmers-53% • Large farmers-47%	May-July Nov-Feb	Peak time-70 Off peak-14	• Small farmers-BDT 22,500 • Large farmers-BDT 55,000	BDT 6,520,000	Mix of cash and credit but around 70% payment is made immediately and credit settled later in cash.

From the table above, it is seen that collectors deal with both large and small farmers, although the average transaction size with each actor is considerably different. While buying, the collector pays either fully or partially in cash and then pays back the remaining amount within two to three weeks (i.e. the time needed to sell their goods and realize payment). Only two collectors out of five interviewed mentioned that they

have to travel to settle accounts with farmers. It was seen that their average travel time for the journey amounted to 20 minutes and cost around BDT 10-20 for each trip. Such trips need to be made at least twice a month, especially after the period of peak purchase. Although, rather than meeting farmers individually, they ask them to wait in groups of 5-10 to save time. From field observation, it was also seen that 80% of the collectors were satisfied with their current method of transaction with their sellers. 20% of the collectors mentioned that due to pressure from farmers to repay them quickly, they are sometimes under stress. Since their money is also tied up somewhere, they sometimes face difficulty paying the farmers on time.

Millers

Table 16: Buying behavior of millers

Purchased from	Peak times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchase value (annual avg.)	Payment mode
• Small farmers • Large farmers • Collectors • Commission agents	All throughout the year but peaks in May, June, Dec and Jan	• Peak-49 • Off peak- 15	**BDT 229,000** • Small farmers- BDT 98,000 • Large farmers- BDT 200,000 • Collector- BDT 115,000	BDT 12,240,000	A mixture of cash and credit with all the actors.

The millers interviewed during this assessment mostly purchased paddy from farmers directly since they were small scale mills and located in close proximity to the farmers. The millers are volume buyers and their yearly turnover is quite significant. Millers employ a mixture of cash and credit to pay their suppliers. The frequency of immediate cash payment is higher among some farmers since the volume is lower and they prefer to receive cash immediately, according to millers interviewed. The credit period is between two to four weeks.

Figure 13: A miller's warehouse in Jhenidah

Figure14: A large scale trader being interviewed in Jessore

From field observations, it was seen that millers usually do not have to travel to settle their accounts. However, when they do, they have to spend on average 30 minutes per roundtrip and spend around BDT 50-70. The number of times they have to travel for these purposes is limited to only around two to three times per season.

The millers also expressed their satisfaction regarding their current transaction process with their sellers with 80% of them agreeing that the transaction process with sellers is not hampering their business. The remaining 20% of millers mentioned that dealing in credit is not always good since they suffer from cash flow shortages if their money is tied up for too long.

Large Scale Traders

Table 17: Buying behavior of large scale traders

Purchased from	Peak times of purchase	Times purchased in year (avg.)	Avg. transaction size	Total purchased or cost (annual avg.)	Payment mode
• Millers- 50-60% • Commission agents- 30-40%	All round the year but peaks in 3-4 months a year after the 2 harvest seasons.	Peak- 28 Off-peak- 11	BDT 567,500	BDT 15,333,333	A mixture of cash and credit with millers and bank transfer or bank cheque with commission agents

Figure15: A large scale trader being interviewed in Barisal

The large scale trader plays an important role in the widespread distribution of rice from rice excess areas to rice deficit areas. These traders are seasoned businessmen, buying rice from various mills and commission agents and then transporting them to various wholesale markets around the country and also selling to retailers. Their business is active throughout the year, though their trade enjoys 4-5 months of high turnover. The large scale traders transact both in cash and through the banking system while buying rice.

Only one trader mentioned that he has to travel to pay back his sellers. This trader spends half a day (around 4-5 hours) once a month to clear all his dues, costing him around BDT 600. The transportation cost is high since he does not live near his business partners' establishment and has to travel at least 20-30 kilometers.

2.4.3.2 Selling Behavior

Collectors

Table 18: Selling behavior of collectors

Sold to	Peak times of sales	Avg. transaction size	Total sold per year	Payment mode
• Millers- 90-95% • *Arotdar*-5-10%	Nov-Jan and Apr-Jun	• Millers- BDT 164,000 • *Arotdars*- BDT 100,000	BDT 8,775,000	Mix of cash and credit. Credit is later settled with cash

Collectors are the first level of forward market actors who collect paddy from farmers, aggregate them and then sell to their customers. Millers are their biggest buyers and they also sell to commission agents who buy and sell paddy. They receive their payment in cash and they do not usually use the banking channel. The credit period is around one month.

On average, collectors spend roughly 23 minutes per trip on collections, costing them around BDT 43 per round trip. They usually have to travel to make collections 4-5 times per month. However, they expressed that the need to go for collection does not substantially hamper their business and is considered a part of their business.

Millers

Table 19: Selling behavior of millers

Sold to	Peak times of sales	Avg. transaction sizes	Total sold per year	Payment mode
• Commission agents-20-30% • Large scale traders-60-70% • Retailers-5%	All year-round sales	Commission agents- 150,000 Large traders- BDT 566,667 Retailers- BDT 60,000	BDT 14,918,000	Cash and banking channel but credit is often given.

Millers mainly sell the milled rice to large scale traders, who then distribute it throughout the country. Millers also sell through commission agents. The average transaction size with large scale traders is quite notable compared to the average transaction size with other actors. Most of the millers have bank accounts and prefer large value transactions to be through the banking channel. With the advent of online banking, it's much easier to deposit money into someone's account from anywhere in the country. Therefore, even if the miller's customers are geographically dispersed, the money can easily be deposited into the account of the miller. Millers also have to go for collection drives. On average they spend about 35 minutes per trip and it costs them around BDT 63 per round trip. Forty percent of the millers expressed satisfaction regarding their transaction method with buyers, however, 40% of them were indifferent about it and 20% answered negatively. The main reason for the indifference or dissatisfaction seems to stem from the fact that they have to go for collection drives quite often and it consumes working hours.

Large Scale Traders

Table 20: Selling behavior of large scale traders

Sold to	Peak times of sales	Avg. transaction size	Total sold per year	Payment mode
• Wholesalers- 80% • Retailers- 20%	All year round sales	Wholesalers- Over BDT 2 million Retailers- BDT 20,000-50,000	BDT 20 million	Cash transaction with retailers mostly and with wholesalers, a mixture of cash and the banking channel.

From the table above, it is seen that large scale traders mainly sell to wholesalers located in various wholesale markets around the country. The average transaction size with them is quite large. They also sell to local retailers but the average transaction size with them is quite moderate. They deal mostly in cash with the local retailers due to the small transaction size but transactions with them is in smaller volume but more frequent than with wholesalers. As with the wholesalers, transactions are done both through cash and the banking channel but for larger transactions, the banking channel is preferred. The traders sometimes have to go for collection drives but they tag it with their regular travel plans and, thus, they could not articulate any travel and time cost for those collection drives.

2.4.3.3 Operational Activities of Commission Agents (Arotdar)

Commission agents are the quintessential middlemen in the rice value chain. Usually they have a fixed establishment called *mokam* and it is used for trading of rice by both buyers and sellers of rice. The *arotdars* arrange and oversee the trading and then take commission for their services. From field observation, it was seen that they charge commission of around BDT 10-13 per sack of rice (50 kg of rice) sold from their *mokam*.

When a sale is made, the agent keeps aside his/her commission amount and then gives the rest of the money to the sellers. However, business is done on a credit basis and the agents keep credit with both parties (buyer and seller). One commission agent stationed in Jessore city transacted mainly through the banking channel with their sellers (millers). The main buyers in their *mokams* are the large scale traders and retailers. Transactions with traders is mostly through the banking channel, whereas with the retailers, cash transactions are the norm. One commission agent reported to have a turnover of BDT 100 million (roughly US$1.28 million) per year, thus it gives an idea about the scale of their operations.

Figure 16: Various varieties of rice in display at commission agent's shop

Figure 17: Commission agent in Jessore city

Qualitative Perception of Transaction Process

During the interviews, some qualitative feedback was taken of forward market actors' views on their current transaction processes with their buyers and sellers. The extracts from those discussions is appended below:

- Buying and selling on credit is part and parcel of the business. One cannot avoid it. However, some millers mentioned that they run into liquidity problems if their accounts receivables pile up.
- Those actors used to transact through the banking channel characterized it as the safest and securest way of transaction, especially for large transaction volumes.
- For traders traveling between districts, carrying cash over long distances is a hassle and also risky. They might have to carry cash when collecting money from debtors and also when they are carrying cash to clear some dues. However, none of them reported any cases of theft or robbery on the road.

2.5 Financial Behavior of Rice Value Chain Actors

2.5.1 Farmers

Farming is not dissimilar to running a business. A farmer has to employ land, labor, and capital in their enterprise to get the desired output at the end of the season. Capital or financing of the whole farming activity is crucial to the success of the enterprise. A considerable time of the FGDs focused on how farmers are financing their farming practices and what financing options are available for them along with the pros and cons of those options.

From field observation, it was seen that there are a multitude of options from which farmers can avail financing. Banks, MFIs and other informal sources of finance are there to cater to the needs of the farmers. The name of some banks that came up from the discussion are listed below:

- Bangladesh Krishi Bank (BKB)
- Sonali Bank Limited
- Agrani Bank Limited
- Janata Bank Limited
- Mutual Trust Bank Limited (MTBL)
- Dutch-Bangla Bank Limited (DBBL)
- Islami Bank Bangladesh Limited (IBBL)

Out of the banks mentioned above, only DBBL and Islami Bank are providing mobile financial services. DBBL also has arrangement with BKB, wherein they have MFS agents located at select branches of BKB. Currently, they have MFS agents located in 1,403 BKB branches around the country, providing not only cash-in and cash-out facilities but other ancillary services such as utility bill payment.

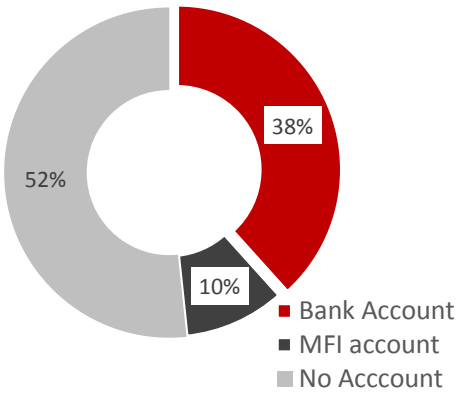
Figure 18: Financial institutions in Jessore

The list of NGOs/MFIs providing financial services in both Barisal and Jessore regions include:

- BRAC
- Grameen Bank
- Jagorani Chakra Foundation
- ASA
- Songram
- Sonkolpo
- Uddipon
- BDS
- Proshika

Figure 19: A leading MFI's office

Accounts with financial institutions



From field observations, it was seen that 38% of the farmers had bank accounts and 10% of them had accounts with NGO/MFIs. The percentage of farmers with bank accounts is encouraging, although there is some way to go before they are fully integrated with the formal financial systems, as evidenced by more than 50% of them without bank or MFI accounts. However, many farmers opined that the loan shark (*mohajons*) days are gone who exploited the peasantry greatly.

Figure 20: Farmers' accounts with financial institutions

Savings behavior

From the FGD findings, it was seen that 38.3% of the farmers regularly save money in an institutional way by purchasing various instruments, such as deposit pension scheme (DPS), fixed deposit receipt (FDR), government savings bonds (*Sanchay Patra*) or other instruments. They usually avail these financial services from banks, post offices, MFIs and sometimes from cooperatives.

Loan taking behavior

A majority of farmers take loans in one form or another to support their farming activities. The farmers availed loans from both formal and informal sources, and some farmers also availed from multiple sources. The diagram below illustrates their source of loans:

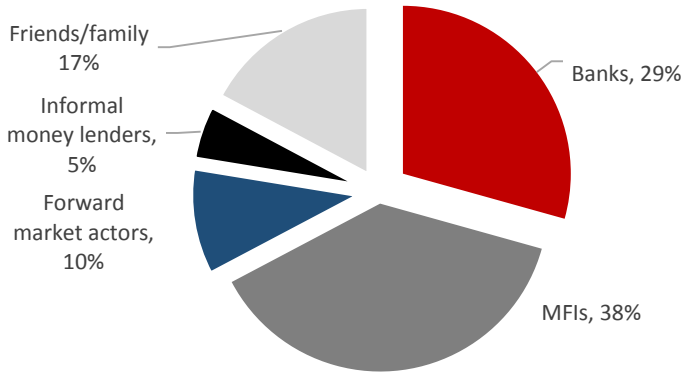


Figure 21: Source of loans for farmers

From the diagram it is seen that MFIs and banks were the preferred source of loans for farmers. Thus, it is heartening to see that farmers are preferring to take loans from formal channels more compared to informal channels. When asked when they were most often in a cash crunch, farmers mentioned that land preparation and planting seasons were the most pressing time for them. They have to buy most of the inputs (seeds and fertilizers) during that time and also spend money on land preparation through tillage and hiring of labor. Thus, referring to section 2.3, it can be concluded that the months of June-July (*Aman*) and December-January (*Boro*) would be the months when farmers face the most shortfall and would require loans the most.

From discussion with farmers, the rate of interest and tenor of taking loans from these sources were ascertained and they are presented in the following table:

Table 21: Various sources of loans for the farmers

Loan source	Effective interest rate	Tenor	Repayment terms
Bank	8-14% p.a.	Usually 1 year but Krishi banks offer flexi loans	• Monthly or quarterly • Krishi Bank scheme allows flexible repayment
MFI	20-30% p.a.	46 weeks	Mostly weekly
Forward Market Actors	n/a	3-4 months	In crop or cash
Informal money lenders	30-50% p.a.	No fixed tenor	One lump sum
Friend/Family	n/a	Mutual consent	Customized

Krishi Bank's agricultural loans seemed quite popular with farmers due to their flexible repayment scheme. Farmers could avail the loan at the beginning of the season and then repay it after selling their crops. The interest rate is also quite reasonable, according to them. Around 10% farmers were seen taking advances from forward market actors, such as millers, at the beginning of the season. They usually repay the loan at the end of the cultivation season. The terms in those cases generally entail that they sell all of their produce to their creditor. However, all the sources have some pros and cons, which the farmers were quite happy to share during the FGDs. The summary of those discussions is depicted in the following table:

Table 22:Farmers perceptions of loan sources

Loan Source	Pros	Cons
Bank	• Reasonable interest rate • Flexi loans scheme (Krishi Bank) • Large amount of loans can be taken • Repayment terms reasonable	• Elaborate paperwork making it time consuming to get a loan • Need for collateral in most cases • Sometimes bank officials have to be bribed to get a loan, thus the effect of lower interest rate is negated
MFI	• Fast processing of loans	• Relatively high interest rate • Weekly repayment is a hassle for farmers and not aligned with their cash flows from farming • Harassment and personal defamation by MFI staff if loan repayment is delayed
Forward market actors	• Flexible repayment terms • Aligned with their cash flows from farming	• Binding to sell produce to the lender • Price at which product is sold could be lower than market price
Informal money lenders	• Funds can be availed almost immediately after application	• Exorbitant and exploitative interest rate
Friends/family	• Trustworthy source • Repayment terms can be customized as per need • Rarely interest/profit has to be given	• Large amount of loan not possible • Failure to pay back may impact relationship

Innovations in Agriculture: Crop Insurance and Agro Helpline Services

The concept of crop insurance is a relatively new phenomenon in the context of Bangladesh, though one can foresee a good opportunity for such schemes, considering that Bangladesh is always beset with natural calamities such as floods, cyclones and droughts. The farmers were asked whether they had heard about crop insurance and it was observed that only 10 farmers out of 60 had heard about it or had some concept about the topic. However, those who heard it did not seem well versed on the topic and could not articulate whether they were interested to avail it or not. To find out more about their receptiveness towards crop insurance, further studies may need to be carried out.

There is an increasing trend of using ICT-based tools in agriculture and service providers are crowding in to cater to the growing market. Various telecom operators along with government organizations like Agricultural Information Services (AIS) have launched mobile-based agro information services for farmers. However, from field observation, the awareness and usage of these services was quite low. Only 27% of farmers had heard about such services and only one farmer was found to have used such services for seeking agro-based information once. He opined that he was reasonably content with the service he got but the high tariff deterred him from making repeat calls.

2.5.1 Input Sellers

Accounts with Financial Institutions

From KIIs with input retailers, it was seen that five out of the six input retailers had bank accounts, although only one of them had any sort of financial activity with an MFI (loan availed). The input retailers maintained relations with the bank for a variety of reasons such as for transactions with customers and taking loans.

Loan and Savings

None of the input retailers had availed any savings products from any financial institution. However, half of the input retailers mentioned that they needed to take loans from time to time in order to conduct their business smoothly. Two of them took loans from the bank and one of them from an MFI.

The input sellers also expressed their views about financial services available to them. They thought bank loans have low interest rates, although they also felt that bank loans are time consuming to receive and that some bribery is often involved in getting a loan. They also thought the elaborate paperwork required to submit an application to the bank is a big hassle. They opined that MFI loans are much easier to get but the high interest rate means that the benefit derived from investing the loan amount would be offset by the interest payments that have to be made.

Travel and Time Cost to Avail Financial Services

The figure below depicts the total time and cost involvement of the input retailers, in order to access financial services near to them. Such analysis for farmers was not included in the scope of the study.

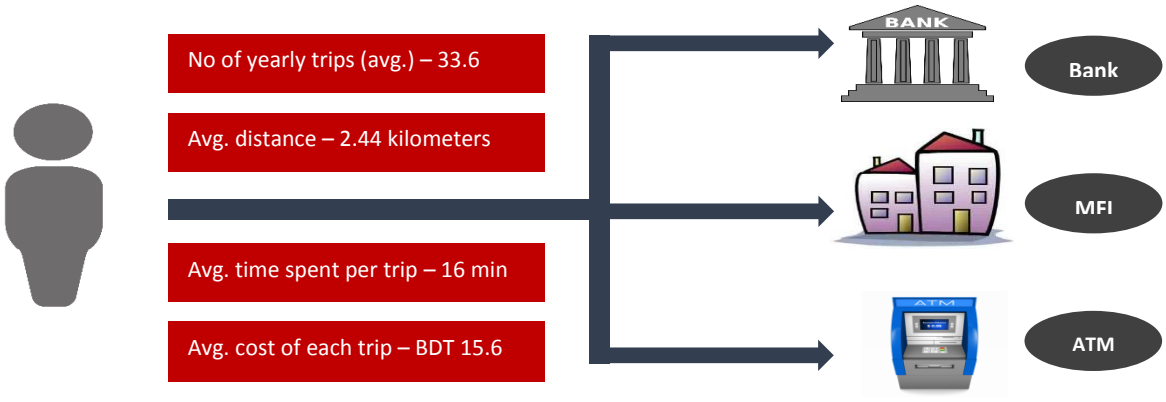


Figure 22: Input sellers' travel and time cost to avail financial services

Therefore, if we convert to yearly figures, then the total money spent on travelling is on average BDT 524.16 and the total time consumed is on average 537 minutes or around 9 hours. From the figure above, it is also understandable that access to financial services is somewhat favorable for these actors and the time and cost involved is not high.

2.5.2 Forward Market Actors

Accounts with financial institutions

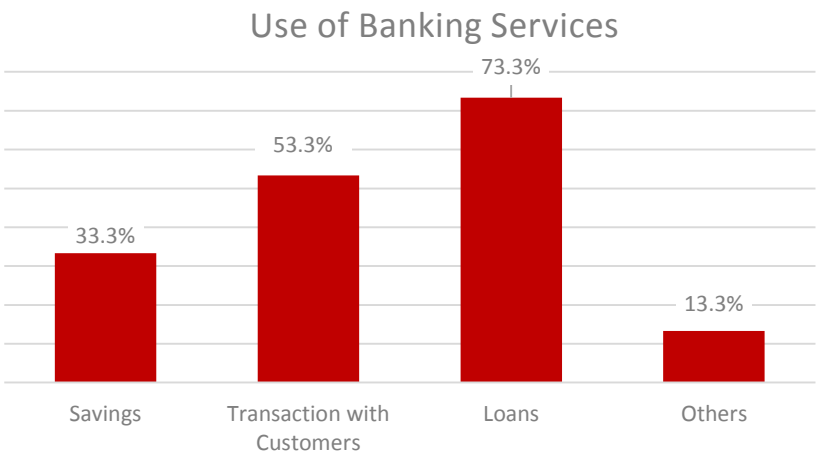


Figure 23: Use of banking services by forward market actors

From the KIIs with forward market actors, it was seen that 73% of the forward market actors have bank accounts. However, it was seen that only one out of five collectors had a bank account. The reason being that collectors are small scale traders who mostly deal in cash. Thus, the necessity of having a bank account is fairly lower for them. All of the millers interviewed and 80% of the wholesalers interviewed had bank accounts or other savings instruments with banks. Some of the forward market actors also availed loans from MFIs, although from the discussions, it did not seem that these were a preferred source for them since the micro-loan amounts do not meet their requirements. The figure above shows the purpose for which banking services were used by the actors.

The figure shows that forward market actors take advantage of banks for securing loans. More than 70% of these actors were seen enjoying cash credit (CC)[1] limits with various banks. The figure also shows that over 50% of these actors use banking services for transacting with customers. This is not unusual, given the large volume transactions that these actors have to conduct every now and then. Another factor that this can be attributed to is the fact that many of their transaction partners are located at considerable distances from them, thus using the banking channel (esp. online banking) is convenient for them. Some actors also use banking services to avail other services, such as keeping valuables in lockers, and one actor also mentioned that he remits money to his daughter studying abroad.

Loan and Savings

Only 5 out of the 15 actors mentioned that they saved money regularly, mostly in banks. However, one respondent mentioned that he has some savings in his mobile wallet, which was encouraging to see. When it came to taking loans, 20% of collectors said they availed loans, whereas all of the millers and 80% of the wholesalers (traders and *arotdar*) mentioned that they availed loans. The figure below depicts the source of loans for these actors:

[1] Cash Credit or continuing credits are those that form continuous debits and credits up to a limit and have an expiration date. A service charge that is in effect an interest charge is normally made as a percentage of the value of purchases. It's flexible for businessmen and the account needs to be adjusted before expiry date.

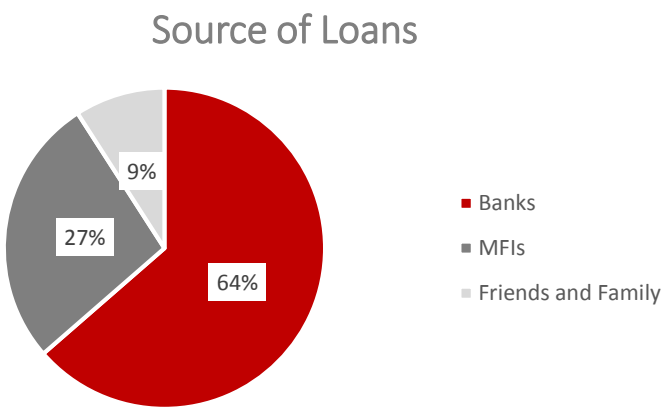


Figure 24: Source of loans for forward market actors

The figure shows that banks are the preferred choice for the forward market actors when it comes to taking loans. It was seen that most of the bank loans were actually cash credit (CC) loans and the rate of interest for such loans is around 14-15% p.a. For MFI loans, the interest rate was around 20-25%. When asked about their feelings on interest rates, respondents were reasonably content with the rate they are paying to the bank but had some qualms about the rate of interest charged by the MFIs. However, they mentioned that MFI loans are much easier to get with less paperwork compared to bank loans and are a good source of quick funds.

The table below outlines some pros and cons of the source of loans as mentioned by them. It is to be noted that some of the points mentioned in the pros section resembles the ones mentioned by the farmers. They might have worded the responses differently but the essence was the same and thus the wording has been kept the same in both tables. However, forward market actors gave some different opinions when talking about the pros of loan sources.

Table 23: Forward market actors' perceptions of loan sources

Loan Source	Pros	Cons
Bank	• Continuous credit facility can be availed • Reasonable interest rate • Large amount of loan can be taken • Repayment terms reasonable	• Elaborate paperwork making it time consuming to get a loan • Need for collateral in most cases • Sometimes bank officials have to be bribed to get a loan, thus the effect of lower interest rate is negated
MFI	• Fast processing of loans • Good for emergency situations and plugging working capital gaps	• Relatively high interest rates • Weekly repayment is a hassle • Harassment and personal defamation by MFI staff if loan repayment is delayed
Friends/family	• Trustworthy source • Repayment terms can be customized as per need • Rarely interest/profit has to be given	• Large amount of loan not possible • Failure to pay back may impact relationships

The forward market actors also mentioned that they require funds throughout the year and that is why their preference is for CC type loans. However, they also resort to quick shot MFI loans if and when required. Collectors mentioned April and May to be the biggest crunch time for them, whereas millers and the other forward market actors could not specify a crunch time but might avail a loan at any time of the year as needed.

Travel and time cost to avail financial services

The figure below depicts the total time and cost incurred by forward market actors in order to access financial services near to them.

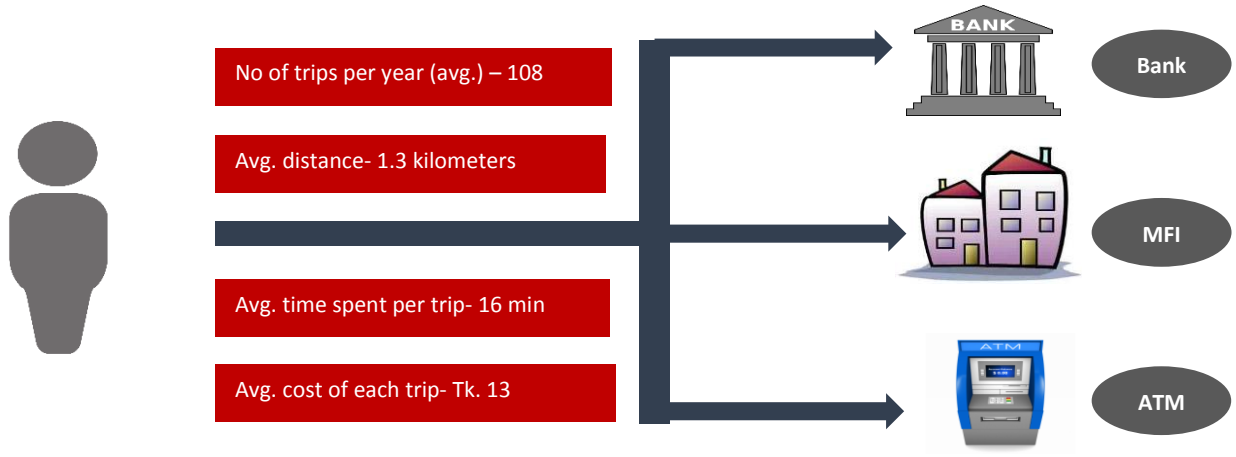


Figure 25: Travel and time cost to avail financial services for forward market actors

Therefore, if we convert to yearly figures then the total money spent on travelling would be BDT 1,404 and the total time consumed would be 1,728 minutes or around 27 hours. Thus, it seen that forward market actors spend almost three times more time and money annually on accessing financial services than input retailers. However, the nature of their trade and their transaction volume probably justifies this effort. Notable here is that the distance to avail financial services is not that far and are within walking distance.

2.6 Awareness and Usage of Mobile Financial Services by Value Chain Actors

2.6.1 Farmers

A good part of the FGD discussion with farmers focused on the awareness and usage of mobile financial services by them, including which providers they are subscribing to and why they are using those services. The figure below shows the usage rate of MFS among the farmers.

Usage of MFS

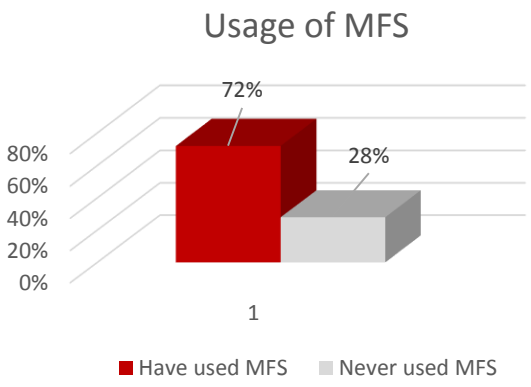


Figure 26: Usage rate of MFS by farmers

From the figure, it is seen that 72% of the farmers have used MFS at least once in some capacity or another. This is a sign that rural level farmers have some exposure to mobile-based payment systems. However, an important point of note is that of all of the 43 respondents who have used MFS, only 4 of them have used their own wallet for transactions, the remainder had made over-the-counter transactions.[2] So basically, only 4 out of 60 farmers have their own MFS accounts. Therefore, even if the usage rate of MFS is relatively high, the use of personal accounts is quite low.

MFS Service Providers Used

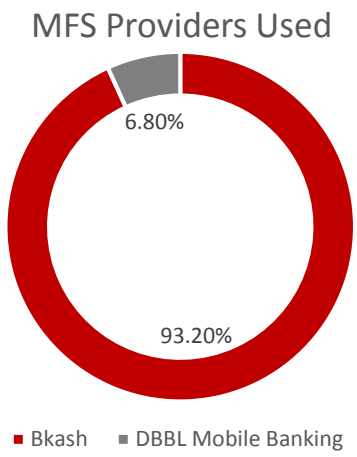


Figure 27: MFS providers preferred by MFS users

The figure to the left depicts the MFS providers which the farmers have used.

It shows that bKash is quite clearly the most widely used service provider among the farmers surveyed (i.e. 93.2% of the respondents used bKash and only 6.8% used DBBL Mobile Banking). Only one respondent was found to have used both bKash and DBBL Mobile Banking.

[2] Over-the-counter (OTC) transactions are when an individual sends and receives money via an MFS agent, instead of using their own MFS account (or wallet). Full OTC transactions are when both sender and receiver use the agent's account. Partial OTC transactions are when either the sender or receiver uses the agent's account, and the other party uses their own MFS account.

Purpose of Using MFS

The farmers also expressed the purposes for which they have used MFS. The results are depicted in the figure below:

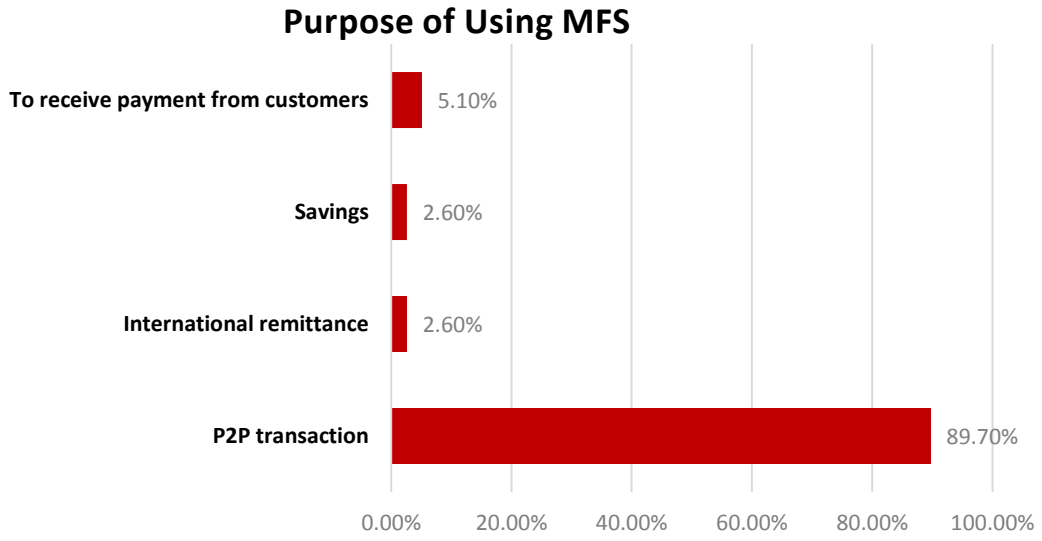


Figure 28: Purpose of using MFS by farmers

From the figure, it is seen that 89.7% of the usage is for person-to-person (P2P) transactions, most of which are over-the- counter transactions. These transactions were also conducted for personal transactions and not for business transactions. It is evident that farmers are yet to adopt mobile payments for transacting with their forward and backward market actors. Of those farmers who had used MFS for business transactions, they mentioned that it was not part of their regular transaction but rather done on ad hoc basis. Only one farmer mentioned that he receives money from abroad through MFS.

Frequency of Use

The frequency of MFS use by the 72% of respondents is shown in the following table:

Table 24: Frequency of MFS use

Frequency of use category	Frequency of use percentage
Daily	-
Weekly	9.3%
At least once in two weeks	9.3%
At least once in every month	30.2%
At least once in three months	23.3%
At least once in six months	25.6%
At least once a year	2.3%

From the table above, it is seen that the vast majority of respondents use MFS fairly infrequently, with more than 80% using it, at most, no more than once a month. Less than 10% used MFS on either a weekly or bi-weekly basis, and none of the respondents were using it daily.

Average Transaction Size

The average transaction size for the farmers was calculated to be **BDT 5,602** per transaction. As mentioned before, farmers mainly use MFS for personal transactions and, although the transaction volume of farmers with input retailers would fall below the average transaction size of the farmer, they seem reluctant to do so at present.

Agent Location and Accessibility

Since most of the transactions took place through the agent and also the fact that an agent is required whenever cash-out is done, the location of the agent is an important factor in the adoption of MFS by farmers. The diagram below illustrates the farmer's time and money spent on accessing MFS agents.

Figure 29: Farmers' access to MFS agents with time and cost considerations

Based on the figure above, it is seen that agent locations are quite accessible (mostly walking distance) for the farmers and does not involve too much cost on average to reach them. Thus, it can be deduced that, at least in the villages covered during this assessment, the MFS agent networks are fairly well developed and that accessing MFS agent points is generally convenient for the farmers. From field observation, it was seen that all of the rural markets and gathering places visited have at least one agent. In many cases, the person providing mobile top up and other telephone services is also working as an MFS agent.

Perceptions about MFS and its uses

Farmers were probed on their perception about mobile financial services in general and whether they see it as viable means to conduct more frequent transactions, especially with their value chain stakeholders. The following table summarizes the main outcomes from those discussions. What is worth noting from the below is that because most of the farmers who have used MFS before are using over-the-counter transactions, their perception of pricing is somewhat skewed. This is because OTC transactions are technically not allowed, so MFS agents set their own rates (generally around BDT 20 per transaction), which are much higher than the standard transfer rate if using a personal MFS account (BDT 3-5 per transaction).

Table 25: Farmers' opinions about MFS

Discussion Areas	Farmers' Opinions
Positives of MFS	• Fast and instant transaction to any place in the country. • Agents are easily accessible and near to their home.
Negatives of MFS	• Very high charges. Not feasible for small farmers to do frequent transactions. • Sometimes problems with network so agents cannot send or receive money.
MFS for business transactions	• High cash-out charge means large value transactions are not very popular. • Stakeholders such as input sellers and buyers are either nearby or they come to us to make payment—thus, no need for MFS use. In case stakeholders were living far way and had to travel long distances, they might think about using MFS. • They visit the marketplace at least 2-3 times a week for household needs and to chat with fellow farmers. Thus, they can buy goods there with cash. There is no need to use MFS there. • Their buyers do not have MFS accounts so even if they have one, it will not matter much.
MFS to receive training conveyance payments	Just over three-quarters of respondents (46 out of 60) do not want to receive conveyance allowances during training through MFS. Their penchant for receiving payments in cash was evident. They prefer to be handed the cash on the training day rather than wait for it to come via MFS. Since it is a small amount of money, they do not see the need to go through the hassles of using MFS.
MFS for receiving government subsidies	Only 2 people out of 60 received subsidies (old age pensions) from the government. However, they could not articulate whether it would be better to receive such payment in cash or through MFS.

2.6.2 Input retailers

MFS Usage

All the six input retailers interviewed for this assessment stated that they had used MFS at least once in their lives. Furthermore, all of them had used bKash while making transactions. Two of them made the transactions using their own accounts, while the others transacted via an MFS agent. Those who used their own account did the transactions themselves and did not require any assistance from anyone.

Purpose for Using MFS

They mostly used MFS for domestic remittances for personal use, although two retailers mentioned that they used it to make payments to sellers and their buyers. However, those transactions were one-off transactions and not part of their regular transactions.

Frequency of Use

Although the sample size is limited to just six people, the table below shows the frequency of their use of MFS:

Table 26: Frequency of MFS use (input retailers)

Frequency of use Category	Frequency of use percentage
Daily	16.7
Weekly	--
At least once in 2 weeks	33.3%
At least once in every month	--
At least once in 3 months	33.3%
At least once in 6 months	16.7%
At least once a year	--

Average Transaction Size

The average transaction size for the input retailers was calculated to be **BDT 5,000** per transaction. This figure might suggest that there is a scope for MFS use within transactions between retailers and farmers, although the close proximity of farmers and reluctance to bear the cash-out charge means input retailers are yet to fully adopt MFS for receiving payments.

Agent Location and Accessibility

Through field observation, it was seen that input retailers are located less than a kilometer from MFS agents since they are usually located in marketplaces; therefore, the input retailer's time and money costs to reach the agent are negligible.

Perceptions about MFS

During the KIIs with input retailers, they were asked about their perceptions regarding MFS in general and whether it is viable for business transactions or for receiving training allowances. The table below captures the sentiments of both users and non-users of MFS.

Table 27: Perception of MFS (input retailers)

Discussion Areas	Opinion
Positives of MFS	• Fast and instant transaction. • Urgent transactions can be done with actors in any part of the country.
Negatives of MFS	• High charge means frequent transactions cannot be done.

Discussion Areas	Opinion
MFS for business transactions	• High cash-out charge means large value transactions are not very encouraging for the actors. According to them, their profit margin is eroded if they have to pay the charge. However, they do not mind receiving money if the charge amount is paid.
MFS for receiving training conveyance payment	• Prefer to receive cash and not complicate things but, if it is made mandatory by the training NGO, they will accept it. • One input retailer mentioned that, if these trainings were frequent and large amount of money was given, then receiving it in an MFS account would be beneficial. Although, it might not be feasible for small transfers.

2.6.3 Forward Market Actors

MFS Usage

The usage rate among collectors was quite low with only one out of five collectors having previously used MFS. All of the millers interviewed had used MFS at least once and 80% of the wholesalers (large scale traders and *arotdars*) had used it. All of the users had used bKash and no usage of other MFS providers was found among this sample size. Among MFS users, 60% used OTC transactions, 30% (three people) used their own account, and one person used someone else's account.

Purpose for Using MFS

Domestic remittances for personal use was the dominant purpose for using MFS with 80% of the users having reported that primary purpose. However, 40% of the users mentioned that they utilized MFS to make payments to suppliers and 30% of the users used MFS to receive payments from customers. But as stated by the actors, this is not their regular mode of transaction.

Frequency of Use

The table below shows the frequency of use among the ten forward actors who have used MFS. The majority (80%) are using MFS between at least every two weeks and once a month.

Table 28: Frequency of MFS use (forward market actors)

Frequency of use category	Frequency of use percentage
Daily	--
Weekly	--
At least once in 2 weeks	50%
At least once in every month	30%
At least once in 3 months	10%
At least once in 6 months	10%
At least once a year	--

Average Transaction Size

The average transaction size for the forward market actors was calculated to be **BDT 9,380** per transaction. If one looks at the average transaction size of the collectors, millers and traders, it is seen that it is usually significantly higher than the average ticket size of MFS transactions. Therefore, it is difficult to foresee millers and traders using MFS on a regular basis at present.

Agent Location and Accessibility

Data revealed in the table below shows that forward market actors are quite favorably located to agent points and the time and money required to access them is negligible.

Table 29: Agent location and access (forward market actors)

Particulars	Details
Agent location distance (avg.)	0.37 km
Time taken to reach agent (avg.)	5 minutes
Cost to reach agent (avg.)	BDT 4

Perceptions about MFS

During the KIIs, forward market actors were asked about their perception about MFS in general and whether it is viable for business transactions or for receiving training allowances. The table below captures the sentiments of both users and non-users of MFS.

Table 30: Perception of MFS (forward market actors)

Discussion Areas	Opinion
Positives of MFS	• Fast and instant transaction. • Urgent transactions can be done with actors in any part of the country. • Can transact beyond banking hours. • Saves transportation and time cost. • Easy to withdraw cash since agents are everywhere. • Can do mobile top up. Useful if on the move.
Negatives of MFS	• High cash-out charges mean that frequent and large volume transactions are impractical to do.
MFS for business transactions	• High charges mean large value transactions are difficult, although favorable for smaller value transactions and transactions to stakeholders living far away. • If they visit a person's house, it builds trust and brings more business. For these reasons, MFS may not always be useful. • In the evening, they often go to market to have tea, have a chat and then conduct other business. As they can accomplish multiple things in one area, they are not bothered about using their time or money for travelling to the market.
MFS for receiving training conveyance payments	• If they have an MFS account, they would not mind receiving stipends through it. However, for small amounts of money, it is more desirable to receive it in cash.

3. Feasibility of MFS Adoption in the Rice Value Chain

3.1 Observations of Transaction Flows and Financial Behavior of VC Actors

On the basis of the findings depicted in the previous section, some core observations can be made that form the basis of any recommendations for MFS uptake in the rice value chain. Many actors were seen not adopting MFS due to fear of cost; however, this fear may have emanated due to lack of awareness and proper understanding of MFS, its true pricing and the benefits it can actually provide in terms of time and cost savings. Obviously, MFS may not be applicable for all value chain actors in all of their payment streams but it is most certainly feasible for some streams.

Besides cost considerations, one also has to consider that the MFS ecosystem in Bangladesh is still developing and there are not really any MFS products specifically targeted to the agriculture sector. As such, some respondents were not able to imagine how MFS could be used in their work. It is important to remember that MFS in Bangladesh is still only around five years old, so there is a lot of room for the sector to develop. As it does, users will find that they will be able to do much more than just cashing out or sending domestic remittances, and ultimately be able to use their MFS account to address most of their daily financial needs. In the past two years alone, the number of active MFS accounts in Bangladesh has grown by 240%, to more than 14 million as of March 2016. This figure is almost certain to continue to grow as MFS providers are able to appeal to more Bangladeshis through new products and marketing.

Another factor to consider is that none of the respondents felt any risk with carrying cash, as none had previously experienced theft. The risk of carrying cash has been a driver of MFS uptake in some other countries, although clearly this is mostly irrelevant in the rural Bangladeshi context.

3.2 Feasibility and Recommendation of MFS for Value Chain Actors

Based on the considerations in section 3.1, a feasibility analysis was conducted for all the actors to gauge whether MFS would be suitable to integrate into their payment streams and, if so, what type of MFS would be suitable for them. It explores how MFS could be beneficial for each value chain actor within each payment stream, some of the potential risks and challenges and mitigation strategies. One common challenge is the likelihood that some of the value chain actors may be resistant to change. As found during the field survey, a significant number of respondents felt that the current ways of transacting are simply how things are done. As such, some of them were not even thinking about how any of these payments could be done differently. The only way to counter that sentiment is through ongoing and continuous awareness raising to share the real potential benefits of MFS, better explain the cost of cash, and to debunk some of the incorrect information that persists (such as excessive fees).

It is also important to note that while the recommendations have been divided up by value chain actor, each is somewhat dependent on the others. This is because digital payments, whether through MFS or other channels, work best when the money stays digital throughout the different transaction flows. If, for

example, none of the input dealers will accept mobile payments from farmers, then farmers will be less likely to want to accept mobile payments from their buyers. This is both because of the added hassle of managing cash and digital funds, and because some of the higher MFS fees are cash-out fees. If, on the other hand, farmers (or any other actor for that matter) are able to accept and make payments via MFS, they will avoid cash-out fees and be able to fully appreciate the convenience and cost benefit of MFS over their current payment methods. If one link in the transaction chain does not accept digital payments, then the efficiency and cost benefits are disrupted and it becomes less attractive as a payment mechanism for other actors.

To better understand what opportunities may exist for using MFS, let's first look at the different types of MFS accounts currently available in Bangladesh, as presented in the following table:

Type of MFS Account	Description	Fee Structure	Transactional Limits
Personal account	Anyone can open a personal account by submitting the necessary documents.	Refer to the 'Individual Account Pricing' section here for more details.	P2P transactions are limited to a maximum of BDT 10,000 daily and a total of BDT 25,000 on a monthly basis.
Agent account	An account through which personal account holders can do cash-in, cash-out or other services offered by service providers. Most of the service providers offer cash-in service free of cost for the customers.	There is no fee applicable to agents for doing transactions into any personal account. In fact, agents receive a fee from the provider for transactions they service.	There is no specific transactional limit set by the service providers as agents work as key cash points for end customers.
Merchant account	A MFS merchant is a type of account that enables the holder to accept payments from customers.	Free for the consumer, but merchant pays a fee. Refer to the 'Corporate Account Pricing' section here for more details.	Limits vary by service provider with maximum monthly transaction amounts ranging between BDT 15,000 to BDT 100,000.
Corporate business agent account	This is an agent account offered by some providers. It can be used to make payments to tagged MFS collection type accounts free of cost. This type of account usually receives e-money from local distributors and allows them to transfer funds only to the account to which they have been tagged.	There is no fee applicable to agents for doing this type of transaction. Corporate clients are charged on an accumulated basis while doing a settlement. For more details, please check here.	There is no specific transactional limit set by the service providers as this account is only allowed to make transactions with a tagged collection account.

Type of MFS Account	Description	Fee Structure	Transactional Limits
Collection account	Collection accounts are enterprise accounts used for collection purposes. Any corporate business agent account can send funds to this account. Different providers have different names for this type of account.	There is a collection settlement fee applicable to the biller. Usually agents/ corporate agents are not charged for this type of transaction. For more details please check here.	There is no transactional limit set by the service provider as this account is backed by a core banking account.

The following table provides recommendations on the most appropriate account type for each of the value chain actors based upon their transaction behavior and nature of business:

Table 31: Recommended account type for VC actors

Actors	Type of MFS Account recommended	Reasoning
Farmers	Personal account	▪ Payment nature with different actors: Making payments to input retailers and receiving payments from collectors/millers/*arotdar*. ▪ Transaction size: Relatively smaller ticket size while paying but moderately higher ticket size while receiving.
Input Retailers	Merchant account	▪ Payment nature with different actors: Receiving payments from buyers and making payments to dealers or companies. ▪ Transaction size: Relatively smaller ticket size while receiving but bigger ticket size while paying.
Input Dealers	Corporate business agent account or collection account	▪ Payment nature with different actors: Making payments to companies and receiving payments from input retailers. ▪ Payment size: Relatively much higher than the input retailers
Companies	Collection account	▪ Payment nature with different actors: In general, receive payments from input retailers and dealers from different corners of the country. ▪ Transaction size: Ticket size is usually large
Collectors	Personal account	▪ Payment nature with different actors: Making payments to farmers and receiving payments from millers. ▪ Transaction size: Moderate ticket size for both receiving and paying but since credit transaction is

Actors	Type of MFS Account recommended	Reasoning
		common, ticket size maybe small enough for MFS transaction.
Millers	Agent account	▪ Payment nature with different actors: Making payments to collectors & farmers. ▪ Transaction: Relatively big ticket size
***Arotdar*/Commission Agent**	Personal account	Business transactions with an MFS account will not be suitable for these actors on a regular basis. However, for small value, urgent transactions, they can use personal accounts.
Wholesaler	Personal account	
Large Scale Traders	Personal Account	

Having explored the various MFS account types and their suitability for each of the actors, an attempt is now made to propose specific payment streams for the value chain actors where MFS can be used. It is worthwhile mentioning that some recommended streams may become more suitable to implement after further development and strengthening of the MFS ecosystem. Streams may also undergo changes as the ecosystem develops further. The figure on the following page is a graphical representation of the recommended payment streams.

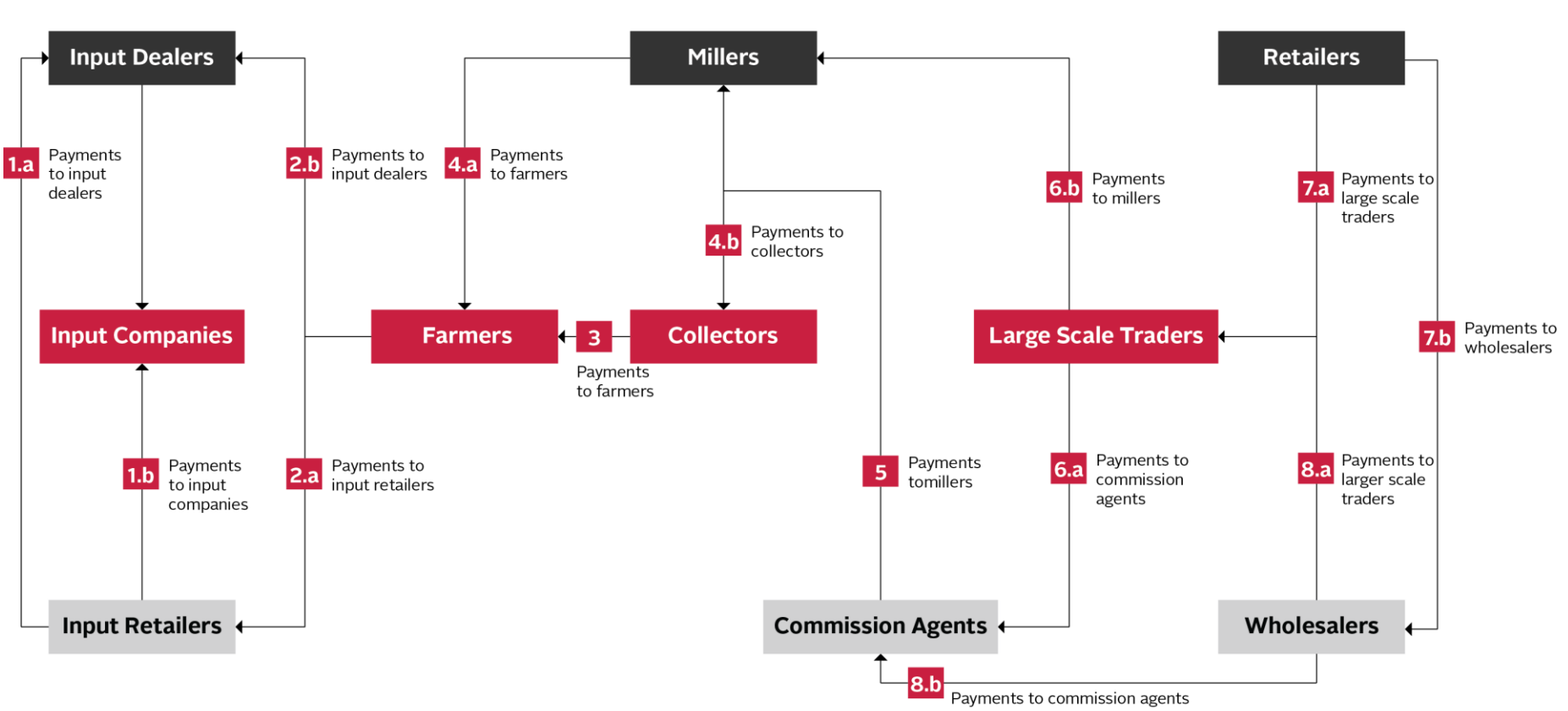


Figure 30: Recommended payment streams for value chain actors

A detailed explanation of the above figure is provided in the following table:

Table 32: Recommended payment streams for VC actors

Transaction number	Transaction type	MFS opportunity	Benefits	Risks/Challenges	Risk/Challenge mitigation
1.a & 1.b	From input retailer to input dealer and input company	Input retailers could pay input dealers/companies via their merchant account into either a collection account or corporate business agent account. In terms of receiving funds into a merchant account, the limit is higher than a personal account. Merchant accounts are generally charged between 0.25% - 2.00% per transaction (depending on provider).	▪ **Input retailers:** For settling dues or payments for regular and short notice input purchasing, MFS can save time and money as payments can be performed remotely and irrespective of any holidays or after banking hours. MFS would also help to evade cash carrying risks and concern of dealing with fake notes. ▪ **Input dealers/companies:** MFS would facilitate input dealers/companies to carry out business on non-working/banking days or hours. Similar benefits that are being mentioned for input retailers associated with physical cash collection. Moreover, real time deposit into the MFS merchant account would mean that	Input dealers/ companies might not accept paying the associated fee.	▪ Promote the fact that receiving money directly into MFS account will make it easier for input dealers to pay their companies. It will also reduce the cost of collections, including opportunity costs from closing shop to collect and depositing collected cash into bank account. ▪ Also, digitizing more of their payments will make it easier for banks to offer them credit. ▪ Some providers offer very reasonable collection fees (see here) and offer

Transaction number	Transaction type	MFS opportunity	Benefits	Risks/Challenges	Risk/Challenge mitigation
			the deposits are more quickly accruing interest.		discounts based on the collection size and frequency.
2.a & 2.b	From farmer to input retailers and input dealers	• **Option one**: Farmers could pay the retailer/dealer through the retailer's/dealer's MFS merchant account. In terms of receiving funds into merchant account, the limit is higher than personal accounts. The merchants are usually charged between 1%-2% (depending on provider). • **Option two:** Farmers could pay the retailer/dealer up to BDT 25,000 per month and up to BDT 10,000 per transaction into their personal account using P2P transfer at a flat cost of BDT 3-5 (depending on provider).	▪ **Farmers:** For settling dues after harvest, MFS would eliminate the need for farmers to travel to make payment, as payments can be executed remotely, saving them time and money. MFS would also eliminate concern about dealing with fake notes. ▪ **Input retailers/dealers:** By setting up an MFS merchant account, retailers/dealers could receive payments from farmers without visiting them, which is particularly useful for settling dues, as it would be cheaper and would not take them away from their shops.	▪ Ideally, input retailers/dealers would need to open merchant accounts, which they may be reluctant to do given the fees.	▪ Promote the fact that since transaction ticket sizes are smaller, the fees will not be as high as they may anticipate. ▪ Promote that having a digital transaction history may in the future help both farmers and input retailers increase their access to credit.

Transaction number	Transaction type	MFS opportunity	Benefits	Risks/Challenges	Risk/Challenge mitigation
3	From collectors to farmers	Collectors could settle their immediate payments or dues with farmers by using P2P service of up to BDT 10,000 per transaction and BDT 25,000 per month.	▪ **Collectors:** MFS would enable collectors to settle their dues with farmers without travel, saving them time and money, as well as eliminating risk of carrying cash. ▪ **Farmers:** For the farmers, it would eliminate the potential of receiving fake notes.	▪ Collectors may be reluctant to accept paying the transfer fee. ▪ The daily transaction limit for P2P transfers is BDT 10,000. Given the average transaction size for small farmers (BDT 22,500) collectors may not be able to make payments to multiple farmers on the same day or make the full payment.	▪ Try to encourage farmers to allow collectors to deduct out the transfer fee, as in most cases, it will be lower than their travel costs to collect cash, and it will save them time and help avoid fake notes as well. ▪ In most cases, collectors made 70% payment immediately. Thus MFS channel can only be used for settling dues with farmers.
4.a & 4.b	From millers to farmers & collectors	▪ Millers could use MFS for settling dues with farmers and collectors from an agent account using regular cash in service. ▪ Using such type of MFS account will allow millers to transfer	▪ **Millers:** Average ticket size is not small enough to do all transactions in MFS. However, for small value transactions (partial payment or making due payment), MFS can be used to save time and travel cost.	▪ MFS providers may not want to extend agent accounts to millers. ▪ Reluctance of millers to become agents out of concern that it will hamper their regular business activities.	▪ IRRI may have to advocate with MFS providers to open agent accounts for millers. ▪ Millers have to be sensitized about the benefit of opening an agent account.

Transaction number	Transaction type	MFS opportunity	Benefits	Risks/Challenges	Risk/Challenge mitigation
		amounts to farmers or collectors' MFS accounts higher than the transfer limit for personal accounts (i.e. BDT 10,000).	▪ Using an agent type account means any transaction will lead to the miller receiving a transaction fee from service providers. Thus frequent transaction through MFS will lead to extra income for millers. Millers will be tagged with distributors from mobile financial service providers for cash management. ▪ **Farmers & Collectors:** MFS would enable farmers and collectors to settle their dues with millers without travel, saving them time and money, as well as eliminating risk of carrying cash and receiving fake notes.	▪ Average ticket size is not small enough to do all transactions in MFS.	▪ Millers usually make partial payment and keep some dues with the actors. Therefore, such small value transactions (i.e. partial payment or dues) can be settled via MFS.
5	From commission agents to millers	Large value transactions entail that the banking channel is the most preferred medium. Hence, MFS is not encouraged fully	Not applicable since MFS use is not highly recommended.	N/A	N/A

Transaction number	Transaction type	MFS opportunity	Benefits	Risks/Challenges	Risk/Challenge mitigation
6.a & 6.b	From large-scale traders to millers and commission agents	Most of the time, large-scale traders like to visit *mokams* for trading, so they often do not mind paying in cash. However, the banking channel would be safer and more secure considering the large ticket size.	Not applicable since MFS use is not highly recommended.	N/A	N/A
7.a & 7.b	From retailers to wholesalers & large scale traders	Transaction sizes are relatively small. Since sellers are always on the move, it would be better to keep option of MFS open so that they can receive money in case of urgency.	**Retailers, wholesalers & large scale traders:** MFS would enable retailers to settle their dues with wholesalers/large scale traders without travel, saving them time and money, as well as eliminating raising the risk of carrying cash.	Retailers may be reluctant to accept paying the transfer fee.	Try to encourage retailers to deduct out the transfer fee, as in most cases, it will be lower than their travel costs to settle due, and it will save them time and avoiding cash carrying risk as well.
8.a & 8.b	From wholesalers to large scale traders & commission agents	Large value transactions entail that the banking channel is the most preferred medium. Hence, MFS is not encouraged fully.	Not applicable since MFS use is not highly recommended.	N/A	N/A

3.2.1 Recommendations for IRRI

Capacity building of value chain actors on MFS: Before suggesting any specific intervention on MFS, it is imperative that all of the relevant value chain actors are well-versed about MFS, its applications, its costs, and it potential benefits. Without sensitizing the actors on MFS, it would be difficult to encourage them to adopt MFS without a lot of friction. From this assessment it was seen that although awareness about MFS exists, it is based more on over-the-counter transactions for personal purposes, rather than for business transactions. As such, there is also some misunderstanding of the price structure, with significant numbers of respondents saying that MFS is not suitable for large transactions due to the fee. In reality, the fee for making a person-to-person transfer is a flat fee that ranges from BDT 3-5 with most providers. The percentage fee is normally assessed on cash-in and cash-out, although the amounts vary by provider. If actors do not cash out and instead keep their money within the MFS system, the fees would be drastically reduced, and in some cases, eliminated. Understanding how to make the most of MFS and how to reduce their transactions costs through that channel is therefore critical. This can be facilitated by identifying lead farmers and other leaders within the community who can serve as advocates for MFS in their communities.

Since IRRI Bangladesh is working with all of the value chain actors of the rice value chain, they have an opportunity to arrange sensitization workshops for the farmers, input sellers and forward market actors regarding the benefits of MFS in making business transactions. mSTAR/Bangladesh can provide the necessary technical support and also involve the service providers to provide resource persons for the capacity building activities.

Savings through MFS: Savings are especially important for the agriculture sector, which is characterized by seasonality, irregular revenues, and exogenous risks. Farmers are most at risk of not having enough funds at the right moment and suffering from working capital crisis. Thus if farmers can easily access savings products through MFS, instead of having to go to the bank, then it will be convenient for them. Around 30% of the farmers were seen saving money from time to time, whereas the rest did not have enough money to save through formal institutions. Mobile money accounts can be a convenient channel for savings for farmers. Several of the MFS providers offer interest rates on savings, and at least one provider (MYCash) offers DPS schemes through MFS accounts. The paperwork required to open an MFS account is less burdensome than what is required to open a bank account. While the interest rate is not competitive with market rates of other banking instruments offered through banks, such as FDR and DPS, for individuals who do not have easy access to a bank, the interest rates offered through an MFS account will still be higher than what they get from hiding their spare cash in their home. IRRI, therefore, has an opportunity to promote the MFS channel as a savings mechanism for the farmers it works with.

Negotiating reduced fees: Given the price sensitivity of some of the smaller value chain actors, such as farmers, input retailers, and collectors, it may be helpful to explore working with MFS providers to see if any of them are open to reducing some of their fees, particularly for small merchant accounts. mSTAR/Bangladesh can help IRRI to explore this with MFS providers.

3.2.2 Recommendations for MFS providers

Credit delivery through MFS: One of the problems that banks and MFIs face in increasing lending to the agriculture sector is the high cost of cash management, disbursement, and collection associated with operating in rural areas. Digital channels can thus help to expand the availability of credit to rural actors. There are already instances of MFS being used successfully in many developing countries across Asia and Africa for disbursements and collections of loans. One study has shown that MFIs and NGOs can save from 15 percent to 25 percent on the costs associated with delivering loans in rural areas (USAID, 2015). An overdraft credit product with a limit that can be withdrawn and repaid within a span of one year may be suitable through digital channels. This may allow farmers to draw funds when needed and repay when selling is complete. This will help to smoothen the cash flows of farmers and other small scale value chain actors, such as collectors. Use of MFS for other purposes by these individuals also creates a financial history for them, which will make it easier for MFS providers to assess their creditworthiness. Therefore, once MFS providers start to offer loans through this channel, IRRI can promote the use of MFS in general as being beneficial to increasing their ability to access small-scale credit.

Mobile layaway flexible savings scheme for farmers: The overarching objective of the scheme would be to enhance the financial management of farmers so that they are not cash strapped in crucial times. The idea is that farmers would maintain a mobile wallet from which a monthly amount will be transferred to a holding account. Farmers will have to specify, according to their needs, the timeline of such service. When the scheme reaches maturity, the entire accumulated amount will be transferred to the mobile wallet of the farmer and can be used as needed.

Enlist input retailers as MFS agents: Input retailers have fixed establishments from which they cater to their customers. Thus, input retailers can also act as agents of MFS providers, in addition, to their usual trade. When they become agents, they will have an extra incentive to encourage farmers to use MFS for transactions. Input retailers, on the other hand, can be enticed to become agents with the hope of earning some extra money besides their regular business.

Customized product orientation for niche segments: As seen from the assessment, many of the actors that make frequent and large value transactions do not find MFS feasible for those payments. This is due to apprehension about the charges and the fact that limits (daily, monthly) do not align with their transaction demands. Thus, MFS providers may consider customizing product offerings for large volume actors, within the regulatory framework in place for MFS transactions.

MFS promotion among local communities of VC actors: MFS providers can arrange a multitude of promotional events targeted at local communities. Such events may also be tagged with events such as farmer field days (harvest days), courtyard meetings, and market day events, which are regularly arranged by various input companies for the farmers.

Continue to expand use cases for MFS: Development of a MFS ecosystem within the community is important for adoption of the same by the VC actors. It is not enough to just ensure agent points where VC actors can cash in and cash out. If VC actors can see that MFS can be used not just to send and receive money but also to conduct a whole range of transactions, then uptake in rural communities will likely increase. Development of payment points for MFS transactions within the rural setting will accelerate the use of MFS.

4. Potential for MFS Uptake in IRRI Project Activities

4.1 Transaction flows within the RVC project

The RVC project is a 15-month pilot project that builds on the lessons learned from the Cereal Systems Initiative in Southeast Asia (CSISA-BD). The objective is to support the private sector to improve the efficiency of the rice value chain. RVC, at this point, is working through eight partners.

As mentioned earlier, RVC conducts trainings for farmers to sensitize them about using better quality seeds and also to teach them important marketing skills. The number of trainees in each group consists of 40 – 50 farmers and they usually receive a snack worth approximately BDT 50 and a travel allowance of BDT 100 while attending the training. Sometimes external trainers such as DAE staff or agricultural experts are invited to conduct the training and they also receive an allowance for providing trainings. These trainings are arranged and coordinated by IRRI's partner organizations. The six partners working for IRRI are listed in the following table in addition to IRRI workforce for the RVC project:

Table 33: IRRI's partner organizations

Organization	Coverage	Team Size
IRRI Bangladesh	All Districts	32
Bangladesh Development Society (BDS)	Barisal	07
Grameen Jono Unnayan Songstha (GJUS)	Bhola	03
Society Development Committee (SDC)	Fardipur	09
Jagorani Chakra Foundation (JCF)	Jessore	10
Socio Economic Dev. Org. for the Poor (SEDOP)	Khulna	06
Thengamara Mohila Sabuj Sangha (TMSS)	Satkhira	06

Through discussion with IRRI field staff and also representatives of BDS and JCF in Barisal and Jessore respectively, we were able to map the transaction flow from IRRI to its partners and down to farmers for the trainings.

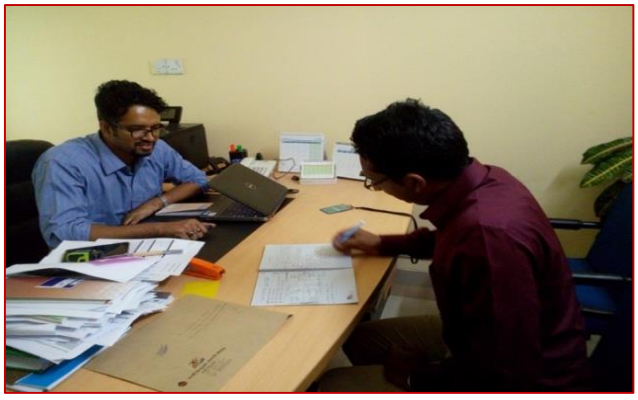


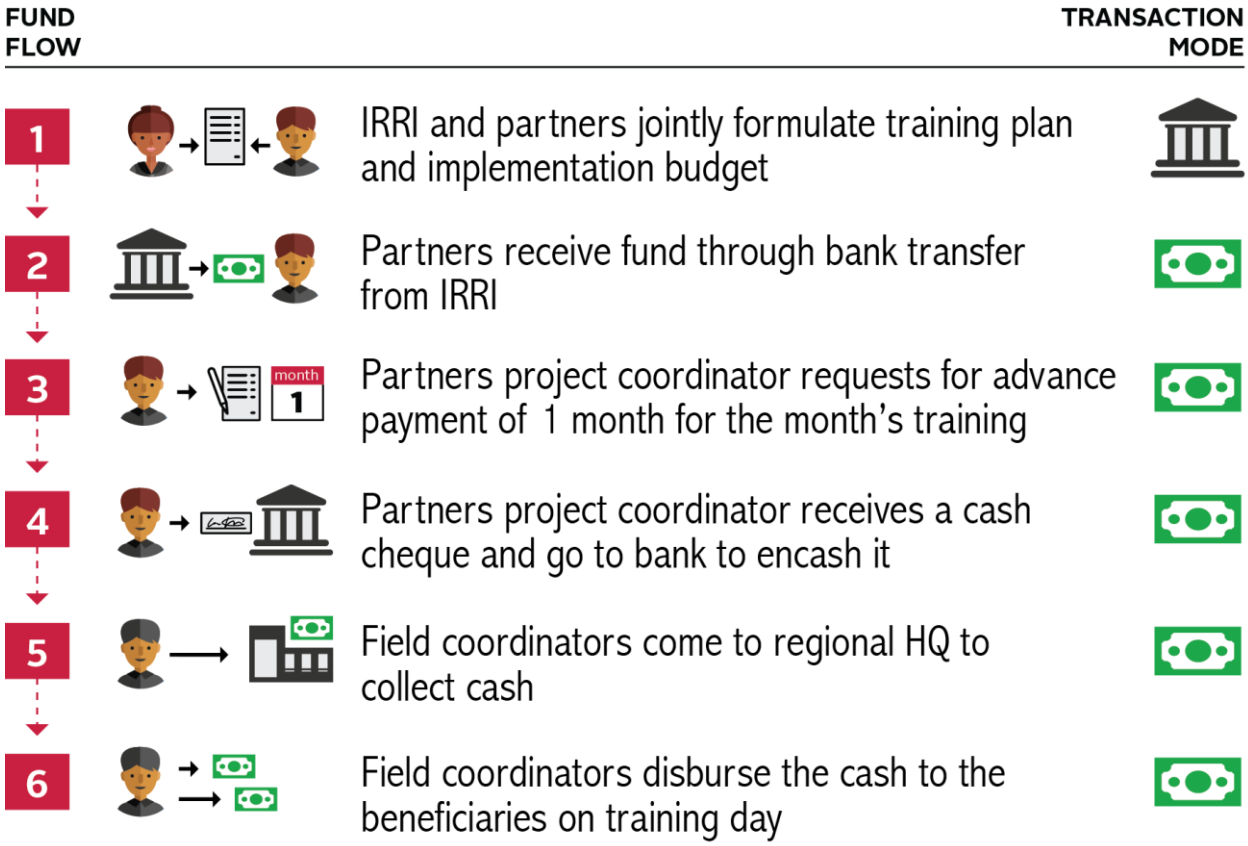
Figure 31: Interview with finance staff of IRRI

IRRI disburses funds via bank transfer to its partners in three to four tranches per year. The amounts are based on the agreed milestones and deliverables of each partner. Each partner has a Project Coordinator (PC) and field coordinators working under them. The PCs responsibility is to channel the funds to the field coordinators and also oversee all the training related financial and logistical issues. The PCs tend to request advances from their organization based on their training plans, which are developed every two to three

weeks. The PC's line manager and the accounts department of that partner verify the request and then approve the advance request and hand a cash cheque to the PC. The PC then cashes the cheque from the bank and withdraws the required funds, which could be in the range of BDT 100,000 to 200,000 and allocated for 8-10 trainings at most.

The field coordinators are located at various locations in the project area. In the case of Jessore, it was seen that one staff was located in Chuadanga District (90 kms) and another staff near Jessore city, about 20-25 km away from the regional HQ of the partner. The challenge for the PC is to ensure that the field coordinators have the required funds for the training at least one or two days before a particular training. There are a multitude of ways that the field coordinators receive the cash. Sometimes they come to the main office of the partner (in Jessore, for example) to collect the cash and other times the PC might hand over the cash to someone else in their office or even IRRI staff who might be traveling near the field coordinator to pass it off to them. After receiving the cash, the field coordinators will keep it on their person and make necessary payments, such as venue cost and advance for snacks to food shops. On the training day, the farmers will also be handed over BDT 100 as travel allowance, after they sign the attendance sheet. *The detailed fund flow is depicted in the following diagram:*

Figure 32: Current payment stream of RVC project



4.2 Observations Regarding Fund Flows

From primary observation, it was seen that the PCs have to withdraw the funds allocated for training several days before the training dates and keep the cash at their own risk, until all the funds have been disbursed. When summoned by the PC, the field coordinators have to travel to come to the regional HQ, collect the cash and then travel back with it to their job locations. They usually carry somewhere between BDT 10,000-20,000, based on the number of training they will arrange. The cash is again kept with them at their own risk for at least one or two days. It was seen that field coordinators have to travel once or twice a month to collect cash. Travel time and cost depends on the location of the staff but it can range from one to four hours and cost between BDT 60 to 300 for each round trip. Thus, sometimes the PC tries to send the funds through other staff to reduce their need for travel. Since this is done informally, if the cash is lost or stolen, then the PC will be responsible for it and not the carrier; therefore, the risk of carrying cash is still present.

4.3 Potential for MFS Uptake

Analyzing the transaction flows within the RVC project, there is great potential to introduce MFS in the process. We have outlined those recommendations below.

Within Partner Organizations

To reduce the risk of carrying cash and also to minimize the travel time required to process payments, IRRI should encourage its partners to adopt **MFS-based payments** within their operations. In order to do so, the partners will need to open a corporate account with an MFS provider (MFSP). The corporate account can be used to make mass disbursements.

In the ideal scenario, the partner would send the funds directly to the MFS account of each farmer. In that case, the partner, with support from IRRI (and mSTAR/Bangladesh, if necessary), would have to first determine whether all of the farmers had mobile phones, and then facilitate opening MFS accounts for them together with the MFPS. This will require a good deal of sensitization and convincing as the majority of farmers interviewed as part of this assessment preferred receiving their allowances in cash rather than through MFS. Once all beneficiaries have their own MFS accounts, it will be possible to disburse their travel allowances directly to their accounts.

All of the field coordinators will also need to open personal MFS accounts. Once the training costs are approved, the accounts department staff would then transfer the training expenses into the field coordinators' MFS accounts directly. The field coordinator could then cash out at an MFS agent near to the training site in order to pay for the venue or to make advances for food. If it ends up not being feasible to send allowances to farmers directly via MFS, the field coordinator can also receive the lump sum into their account and then pay the farmers after cashing out.

Adopting either method would eliminate the need for PCs to handle cash, and also make it much easier for the field coordinators by reducing their travel requirements and giving them more time to focus on their core technical work. The figure and corresponding table below depicts the proposed fund flows for IRRI's partners.

Figure 33: Recommended process flow diagram for financial transactions

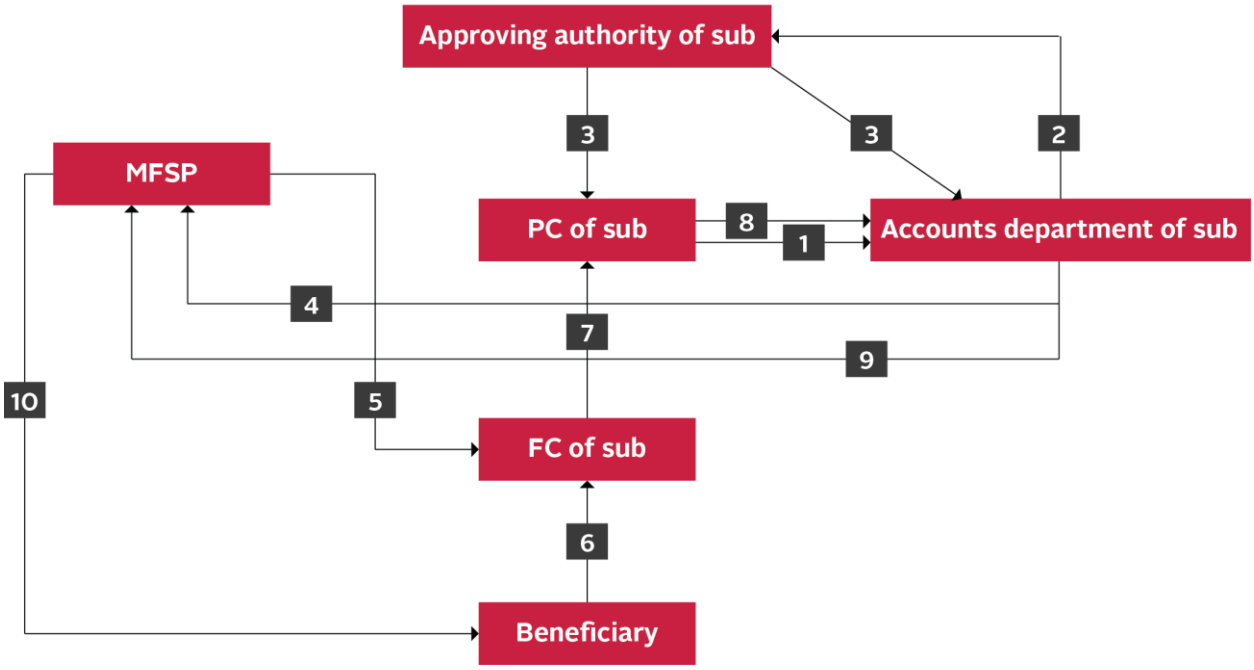


Table 34: Recommended process flow steps description

Activity Number	Activity Explanation
1	Project Coordinator (PC) of the partner requests funds from their respective accounts department based on training plan for one month.
2	Accounts department conducts necessary due diligence and sends to senior management for final approval.
3	Senior management approves fund request.
4	Accounts department send request to mobile financial service provider (MFSP) to disburse fund to the field coordinators (FC).
5	MFSP disburses funds to the FCs.
6	FCs conduct the training and collect signature and attendance sheet from the trainees.
7	FCs send the attendance sheet to the PC.
8	PC verifies the attendance sheet and sends to accounts department.
9	Accounts department sends disbursement information to the MFSP.
10	MFSP disburses the training allowance amount to the beneficiary mobile money accounts.

Digitization of Discount Coupons

As mentioned earlier, every farmer who attends the training is entitled to receive discount coupons through which select seed varieties can be purchased from select input retailer shops at 50% discount. The paper coupon is distributed to the farmers by the field coordinators. When farmers purchase seeds with the coupon, they receive a 50% discount on the total amount purchased (i.e. the farmer pays half price by showing the coupon to the input seller). The voucher used for this transaction has three copies, one copy is given to the farmer, another copy is retained by the retailer and the third copy is sent to IRRI accounts department as supporting documentation for funds claimed by the retailer. When purchasing, farmers also register their names in the input retailer's register book. Later on, IRRI field officers go to the dealer and collect the register book. After due diligence of all the transactions and supporting documents, IRRI reimburses the input dealer through an account payee cheque. The input dealer comes to the IRRI HQ office to collect his cheque when called upon.

This process would be vastly improved if it were digitized. Farmers would be able to provide a voucher code (either received on paper or sent directly to their mobile phone via SMS) that input dealers would verify by entering into their phone. IRRI could then reimburse the input dealer by transferring the funds into their MFS account. Reducing the hassle to receive this payment could be sufficient incentive to encourage any input dealers who do not currently have their own MFS accounts to open one.

These types of systems have been deployed in other countries around the world, although to date, we have not yet been able to identify a viable option within Bangladesh. That said, if there is interest from IRRI to explore this option, mSTAR/Bangladesh could accelerate its efforts to identify a service provider that may be able to offer this type of digital vouchering service.

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