FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Assessing Current and Alternative Financing Products and Delivery Channels in the Agricultural Machinery Market

Prepared for

USAID
FROM THE AMERICAN PEOPLE

CSISA-MEA

CIMMYT
International Maize and Wheat Improvement Center

iDE

Georgia Tech

Study conducted by

LightCastle Partners

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LightCastle Partners
Level 5, House 10/12, Road 1, Block B, Niketan
Gulshan 1, Dhaka 1212, Bangladesh
Tel: +88 02 5881 6311
Email: info@lightcastlebd.com

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List of Abbreviations and Acronyms

ABLE SME	Agriculture Based Light Engineering Small and Medium Enterprises
ASA	Association for Social Advancement
BCUP	Borgachashi Unayyon Project
BDT	Bangladesh Taka
BEIOA	Bangladesh Engineering Industry Owners Association
BN	Billions
CAPEX	Capital Expenditure
CC	Cash Credit
CGS	Credit Guarantee Scheme
CIB	Credit Information Bureau
CIMMYT	International Maize and Wheat Improvement Center
CMSME	Cottage, Micro, Small and Medium Enterprises
CRG	Credit Risk Grading
CSISA-MEA	Cereal Systems Initiatives for South Asia - Mechanization Extension Activity
DAE	Department of Agricultural Extension
DFS	Digital Financial Service
EMI	Equal Monthly Instalments
FCB	Foreign Commercial Bank
FGD	Focus Group Discussion
FI	Financial Institution
GDP	Gross Domestic Product
GoB	Government of Bangladesh
IDLC	Industrial Development Leasing Company
IFC	International Finance Corporation
IPDC	Industrial Promotion and Development Company
KII	Key Informant Interview
KYC	Know Your Customer
LC	Letter of Credit
LCP	LightCastle Partners
MFI	Microfinance Institution
MFS	Mobile Financial Services
MN	Millions
MRA	Microcredit Regulatory Authority
MSME	Micro Small and Medium Enterprises
MSP	Machine Service Provider
NBFI	Non-Banking Financial Institutions
NID	National Identity Card
PCB	Private Commercial Bank
PKSF	Palli Karma-Sahayak Foundation
RMG	Readymade Garments

SIINC	Social Impact Incentives
SOB	State Owned Bank
SOSB	State Owned Specialized Bank
TIN	Tax Identification Number
USD	United States Dollars

Executive Summary

The Feed the Future Bangladesh Cereal Systems Initiatives for South Asia-Mechanization Extension Activity (CSISA-MEA) is a five-year project, funded by USAID and implemented by CIMMYT and its partners: iDE and Georgia Institute of Technology (GT). Through the CSISA-MEA project, the project stakeholders are trying to promote ways to increase access to finance to the different actors in the agricultural machinery value chain. iDE Bangladesh, on behalf of CSISA-MEA project commissioned Lightcastle Partners to jointly conduct a study to deep dive analyze the financing practices among the market actors in agriculture machinery market.

The objective of the study was to unearth the current status of financing options for the aforementioned actors and identify their financing needs. Alongside this, the study will suggest innovative financing solutions for both the agricultural machinery value chain actors and the formal financial institutions. In order to effectively fulfil the core objective of the study, the LCP team has undertaken a mixed approach using both qualitative and quantitative data to obtain insights from the various players in the financial landscape, agri-machinery value chain actors, and business ecosystem builders.

The LCP team has interviewed 12 representatives from the financial landscape including banks, non-bank financial institutions (NBFIs), Micro Finance Institutions (MFIs), agent bank wing of banks and the digital financial services (DFS) of financial service providers. Also, 4 representatives from ecosystem builders including government regulatory departments, industry associations and international organizations were interviewed. The team conducted a sample survey in which 165 enterprises were interviewed. These consisted of agriculture based light engineering (ABLE) small and medium enterprises (SMEs), ABLE micro, small and medium enterprises (MSMEs), Dealers and machinery service providers (MSPs). In addition, the team held two focus group discussions (FGDs) with MSPs in each of Jashore and Cox's Bazar regions. Moreover, the LCP team has also engaged in detailed discussions with 4 representatives of machinery importers, to gain further insights on developing innovative financing models.

Summary of Findings

The LCP team used a lending-stage based framework to assess the demand side pain points at the stages of pre-lending, lending, and post-lending. Alternatively, the same framework has been developed to understand the supply side spectrum. This led to an analysis and deduction of a mismatch in factors of the demand and supply side and the strategy CSISA-MEA may adopt. Meanwhile, suggestions from all the stakeholders interviewed from the regulatory side have also been incorporated.

Findings from the surveys of the demand side actors are outlined in this section according to the different stages of the framework used which are pre-lending, lending, and post-lending, and the players are grouped as enterprise level players (ABLE SMEs, MSMEs, and Dealers) and individual players (MSPs who are machinery service providers). In the pre-lending stage, loan seekers are required to establish a business model viability that makes them eligible for the credit. ABLE

SMEs, MSMEs and dealers need to provide documents such as business financials, collateral to acquire loans from banks and NBFIs. In case of MFIs very few documents, such as NID and ownership documents (e.g. Trade licence) are required to prove their business viability, for which ABLE SMEs and dealers often opt to receive loan from MFIs, despite higher interest rates. Meanwhile, MSPs in general do not get credit from banks due to lack of collateral as the machinery bought is not taken as collateral by financial institutions.

Secondly, in the lending stage, borrowers have to check if they have enough collateral as set by the FIs to get access to the loan size they are willing to take, additionally, they also have to consider the delivery channel (branch and agent points) and processing costs (time and fees) incurred while to take the loan. Due to the businesses of ABLE SMEs, MSMEs and Dealers being seasonal, they often fail to pay during off-season and the lack of seasonality-based loan products increases the possibility of default. Additionally, lack of sufficient collateral leads to a lower than required amount of loan supply from financial institutions. Nevertheless, MSMEs having higher diversification in their product line mitigates the risk of defaulting and they usually have better collateral on offer compared to ABLE SMEs and Dealers. The weakest link is the MSPs who do not get financing as desired due to lack of collateral. At times, MSPs take crop-based loans to purchase machinery as there are no specific products for machinery that they can take. Also, due to lack of awareness about loan products and as most of the MSPs are informal businesses operators with insufficient business record keeping, they incur costs in acquiring documents that are needed for financing.

Lastly, in the post-lending stage, borrowers must check their repayment capacity by considering the down payment made for machinery purchase, their seasonal change in income and see if they are being able to meet the EMI repayment criteria set by FIs. As MSMEs have a huge portfolio of products they do not usually incur problems regarding loan repayments. However, ABLE SMEs and Dealers rely on seasonality to repay the loans. The same goes for MSPs who completely depend on the income earned from the machinery bought on credit to repay the loan. As most of the products are EMI based, they often find it difficult to repay during off-season due to variable income throughout the loan repayment period. This fluctuating income leads them to default on loans for which banks generally prioritize taking business financials and collaterals while providing loans.

For small businesses with limited assets, since banks take collateral, they refrain from taking loans from them and rely more on MFIs as the repayment procedure is more flexible than banks. Additionally, due to poor after sales service of machinery, it was seen that the machinery which are prone to breakdowns in a short span of time are often kept unfixed. This impacts the income generating capacity of MSPs and thus hampers the repayment capacity of loans.

Another significant actor in the value chain are the importers who import the machines of importance to the study such as Combine Harvesters, Rice Transplanters, Reapers, Tractors etc. The importers already have existing relationships with FIs and therefore do not struggle to manage their own financing. However, importers also act as financiers by running hire- purchase schemes through their own balance sheet financing and FIs are not involved in this process. However, since the buyers of these importers fail to repay on time (success recovery for some is

only 60%), the importers face cash crunch when they stock up for upcoming seasons. Moreover, for subsidy-based machines, the investment is made prior to sales and the subsidy is received by the importers within a time gap of 3 to 5 months after sale of products. In addition, these subsidy-based products cannot be recalled and resold to recover the loan amount since the GoB owns a large part of the machine (50% to 70%) for 3 years.

The LCP team has also utilized the same lending framework to understand the bottlenecks faced by the supply side actors (banks/NBFIs/MFIs). Based on the analysis, the key factors required for the development of an innovative financing system are highlighted below.

Firstly, creating an awareness of the attractiveness of the agri-machinery market and the need to develop a market for used machinery. Financial institutions are not aware of how much income modern agricultural machinery can make, how many users of these machines there are now and the prospects for expansion of this market. At the same time, a market for the sale of repurposed machines in case of default has not yet been developed. Moreover, the machine resale value is low.

Secondly, there is a need to cushion the impact of loan default by building into loan mechanisms for buying back the machines and for establishing loan guarantee schemes: One of the key considerations for financial institutions (FIs) is collateral which allows for the recovery of loans in case of loan default. As the agricultural machinery manufacturing and service provision sector are often unable to provide acceptable forms of collateral, already have a poor loan repayment record and fail to demonstrate the to the FI the viability of their businesses, FIs take a high risk when lending to these groups (except when they lend for the purchase of tractors). For MFIs, although loans are non-collateralized, poor recovery hampers their credit rating and creates shortage of funds for reinvestment at the end of the year.

Thirdly, financial institutions (FIs) opt for less expensive channels for disbursement and collection from remote areas. Unlike MFIs, banks and NBFI do not take the community approach (human resources required) to reach rural areas for checking business prospects and guarantors before disbursement of loans. The costs of setting up new branches and maintaining human resources is a huge cost for banks/NBFIs to penetrate remote areas. Although MFIs are partnering with mobile financial services (MFS) for loan repayment through digital wallets this also involves some human intervention. As the central bank has ruled out any additional charges, for banks the challenge will be to incorporate transaction charges if they want to explore agri-loan disbursement through MFS.

Lastly, it is imperative to create digital traceability of machines and the credit history of stakeholders: The machines are movable objects, and they provide service in different regions unlike fixed establishments like dairy/rice mills etc. Installing trackers in machines by the importers can give them unique IDs, like registration numbers, for FIs to be able to track machines. Moreover, development of CIB for MFI based loans can help banks/NBFIs to cross-check credit history of small players who are reliant on MFI financing.

While the pain points of both demand and supply side have been identified, the LCP team has identified the demand and supply mismatch in terms of the above findings. While the suppliers

are evaluating the business model and demand side actors are trying to prove their business model, the major gap lies in establishing the business viability of value chain actors (ABLE SME, MSME, dealers, MSPs) to banks and NBFIs. Absence of record keeping proves to be a major barrier in proving the income generating activities for the small players. However, MFIs tend to finance the small players (SMEs and mostly MSPs) more than banks do under their agri-loan products and most borrowers take machinery loans as a secondary loan.

Similarly, when assessing the risk appetite for finance vis-a-vis risk appetite to take loans, there are certain gaps as well. Here, banks or NBFIs are not involved in the hire purchase schemes provided by importers since there has been experiences of poor recovery. The same is true of the light engineering sector in general including SME, MSME and dealers. Particularly, MSPs are not considered to be creditworthy by most banks and NBFIs and their existing products (SME loan) does not consider the seasonality impact since MSPs lose touch with the banking system when the peak season recurs after off–peak. Meanwhile, partnerships with machinery importers had been explored by banks and MFIs but have had poor recovery experience which makes them sceptical unless some assurance is provided for recovery. Another crucial gap comes from the costs of service delivery as opposed to service access. Based on default records, providing service to small players is expensive for banks/NBFIs since the high-risk profile of these players, along with fixed cost of branch operations, do not justify the interest cap of 9%. Banks/NBFIs do not have enough human resources to cater to small players. However, given the 24% interest rate of MFIs, this compensates for the service delivery where human resource is the major cost head. On the other hand, small players are prone to accessing credit from sources with low or minimal cost (avoiding documentation related charges) and quick processing time. This ultimately boils down to the final hurdle of recovery issues faced by FIs. The FIs cannot afford assigning human resources for physical collection of loans like the MFIs do. Since the machines cannot be taken as collateral nor can the ownership be transferred to banks in case of subsidy-based machines, the FIs are sceptical to lend to value chain actors (SMEs and MSPs mostly). On the other hand, value chain actors struggle to make timely payments due to business seasonality impacts which are not considered in the credit products. Overall, small players at enterprise or individual level are getting crowded out of the formal financial landscape.

Summary of Recommendations

Based on the findings outlined above, the LCP team has identified three strategic pillars that will guide the formulation of the alternative financing models: guarantee of recovery, advocating policy level changes, technical and financial literacy training of value chain actors.

As the first strategic pillar, the alternative financing models will hinge on providing a mechanism to allow the lenders some guarantee or assurance for recovery of loans since farmers and/or small businesses struggle to provide collateral and often fail to make timely repayments. Secondly, whilst the GoB has taken great initiatives to popularise agri-machinery such as introducing subsidies for machines such as Combine Harvesters to make it more affordable for value chain actors, some specific policy level changes can make the suggested financing models work better for all the value chain actors. To this end, for the financing models to work, ownership transfer for the subsidy-based machines is essential to allow reselling in the secondary market, which will

benefit all the value chain actors alike. Meanwhile, if banks could charge interest at a simple rate rather than compounding rate, it will be beneficial for the value chain actors too since the burden of repayment will be lower than that of compound interest rate method. In this case, the central bank could allow a mandate to charge a simple interest rate when financing agri-machinery. Moreover, particularly for the importers, the government may provide import incentives, such as lower import duty, to make the higher purchase selling models of importers more profitable since they can pass on the benefits of lower import duty in the form of lower purchase price to end-buyers. Thirdly, for the financing models to work, the demand side actors should also be made 'finance-ready' for increasing their access to credit products. To this end, financial literacy in terms of record keeping and being able to correctly calculate the business financing needs can improve the chances of acquiring formal loans for ABLE SMEs, ABLE MSMEs, MSPs and dealers. Additionally, for the agri-machinery market to develop, the literacy of the value chain actors in terms of machine operation and daily maintenance must be monitored. This is mostly applicable for the end users, particularly MSPs and farmers, because proper machine usage and maintenance is of utmost significance to increase machine resale value by 50% in the secondary market. This will help develop a secondary market for the agri-machinery that can boost confidence among the financiers that the machines can be resold to recover the loan amount in case of default.

The aforementioned strategic pillars have led to the development of 3 alternative financing models explained in later stages of the report. In Model 1, machines are sold to MSPs by importers who will connect the MSPs to banks for loan. Banks will provide loans under the condition that if the MSPs default, the importers will buy back at the fixed depreciated rate such as 10% after 1 year, 20% after 2 years etc. In this case, banks will have to repurpose the machines and sell it back to the importers. Next in Model 2, MFIs will take a dual role in this model. Importers will partner with MFIs who will act as the distributor for these machines in exchange for a sales commission. MFIs can pass on the benefits of commission to MSPs at a lower interest rate. However, in this case, the importers will have to take on the responsibility of after sales service. Lastly, in Model 3, impact funding approach involves impact investors who provide funding in several tranches on successful achievement of the predetermined targets. For this model to work, the importers will have to provide a social commitment by coming up with impact metrics. Such metrics could include: Beneficiaries (farmer groups) show improved revenue generating capacity; number of farmer groups served etc by comparing it with a baseline study.

A brief summary of the alternative models is outlined below:

Model Number	Challenges/Gaps addressed	Relevant stakeholders	Recommendations (Action Points)
Model 1	• Difficulty in establishing business model viability by MSPs • Low risk appetite of FIs for financing MSPs • High costs of service delivery to MSPs • Difficulty in loan recovery from bank-importer partnership models • Low resale value of machines hampering the attractiveness of financing this sector • Replacement of collateral with guarantee from importers	*Credit Supplier*: Banks, NBFI *Credit User*: MSPs, Importer *Facilitator*: GoB, Development Agencies, Association	*GoB*: Allow reselling of subsidy-based machines before 3 years Importers: Agree to buy-back at depreciated rate and install trackers in machines *Banks/NBFI*: Lend for machinery purchase and repurpose machines in case of default. Disseminate financial content through e-learning platforms and web based platforms. *MSPs*: Attend trainings on machine maintenance and financial literacy and implement the learnings *Development agencies and associations*: Development agencies to partner up with FIs to provide financial literacy training, while associations can give machine related training, and documentation support from associations only.

Model 2	• High costs of service delivery to MSPs and SMEs (operational costs) • Difficulty in availing after-sales services in MFI-importer partnership models • High costs of service access (interest rate) from MFIs • Low resale value of machines • Lack of credit history for MFI-based borrowers	*Credit Supplier*: MFI, Importers *Credit User*: MSPs *Indirect Credit User*: SMEs and MSMEs *Facilitator*: MFS	*MFIs*: Act as financier and distributor by giving collateral free loans. *MFS*: Facilitate the MFI collection process Importers: Pays the MFIs a fixed commission and provides after sales service *SMEs and MSMEs*: Develop capabilities to provide after sales service *MSPs*: Accountable for proper machine maintenance
Model 3	• Low risk appetite of FIs for financing MSPs • High costs of service delivery to MSPs • Replacement of collateral with impact metrics from investors	*Credit Supplier*: Impact investor, Importers *Credit User*: MSP group	*Impact Investors*: Impact investors will provide funding in several tranches on successful achievement of the predetermined targets. *Importer*: Importers will have to provide a social commitment by coming up with impact metrics such as Beneficiaries (farmer groups) show improved revenue generating capacity etc. *MSP group*s: Ensure record keeping of financials

Since the demand-supply gap exists, there has to be a collaborative approach from all stakeholders including regulators to help improve the financing status of the value chain actors. The CSISA-MEA project will play a significant role in bringing all the value chain actors from the demand and supply side actors, as well regulators on the same page to pave the road towards greater access to finance for the agri-machinery value chain actors in the long run. A multi-pronged approach considering the incentives and risks of each of the involved players must be considered. All financing products have risks, but the risks must be shared among the stakeholders to improve the financial status of the agri-machinery value chain actors to promote greater mechanization in the agriculture sector of the country.

Chapter 1: Introduction

1.1. Background of the study

Bangladesh is an agriculture-based country with a contribution of 14.2% in the country's GDP[1]. As an agriculture heavy economy, this country has gone through phases of mechanization. The major turnaround came after 1990 due to the liberalization of the agricultural machinery market and influx of machinery business owners. In recent years, the agriculture machinery market holds around 70 foundries, 800 agricultural machinery manufacturing industries and workshops, 1,500 spare parts manufacturing workshops, and about 20,000 repair and maintenance workshops. This corresponds to an annual total agriculture machinery market size of about US$ 907.5 million of which local production market share is about US$ 402.7 million in 2019[2]. A breakdown of the market size shows the highest contribution to the market size comes from power tillers (USD 70.31 Million), four-wheel tractors (USD 120.00 Million), combine harvesters (USD 40.63 Million), irrigation pumps (USD 140.63 Million), and engines (USD 300.00 Million). This corresponds to the usage of machines in agricultural processes where they prepare 80% of the land, tractors prepare 18% of the land. [3] There are 65 importers available in the country out of which only 4 big players (Metal, ACI, Abedin, Alim) import combine harvester, reaper, and rice transplanter. Monno Agro and General Machinery Limited are entering the market this year. [4] With high import tariffs for importers, it becomes difficult for the machinery companies to provide credit to their clients as they do not receive enough financing from banks to support mechanization.

To promote mechanization in the agriculture sector, the Government of Bangladesh has provided subsidies from 50% (but 70% in coastal regions) on purchase of specific machines. These machines mostly include power tillers, reapers, rice transplanters, and combine harvesters. The Government has also rolled out a 5-year mechanization plan of BDT 3020 Crore in 2020 to hand over 56,000 agricultural machinery. So far, only 2300 machines have been purchased (1,762 were combined harvesters, 379 reapers, and 34 rice transplanter) with government subsidies of BDT 200 Crore (9% of total allocated fund) which has been increased to BDT 680 Crore in the current fiscal year[5]. This low pace of rollout comes from the farmer's inability to buy these expensive machines. If a combine harvester costs USD 31,250, a 50% subsidy still leaves an amount of USD 15,625 to be arranged. Large machinery companies provide credit facilities to small service providers and farmers, but they require a down payment of around 40% of the remaining amount after subsidy coverage. [6] This means that the machinery companies are taking on the remaining 60% burden to recover loans, which negatively affects their cash inflow. On the other hand, this

[1] https://cigrjournal.org/index.php/Ejounral/article/view/3682/2520

[2] https://cigrjournal.org/index.php/Ejounral/article/view/3682/2520

[3] Rahman, Anisur & Ali, Md & Kabir, Md & Rahman, Md & Al Mamun, Muhammad Rashed & Hossen, Md. Anwar. (2020). Agricultural Mechanization in Bangladesh: Status and Challenges towards Achieving the Sustainable Development Goals (SDGs). Ama, Agricultural Mechanization in Asia, Africa & Latin America. 51. 106-120.

[4] https://www.tbsnews.net/economy/stocks/monno-firms-go-full-production-today-299866

[5] https://www.tbsnews.net/economy/farm-mechanisation-awaits-investment-boom-326182

[6] https://un-csam.org/sites/default/files/2020-11/1.%20Country%20Presentation_Bangladesh_Mr.%20Alam.pdf

loan is usually repaid in a year which also affects farmers or machine service providers due to the seasonality impact on their business that makes monthly repayment impractical.

Despite the large number of players in the financial landscape (66 scheduled and non-scheduled banks and 34 NBFIs), the formal MSME finance gap is 67.3 percent[7]. In Bangladesh, MSMEs' access formal finance through banks (public and private), NBFI, and MFIs. The Central Bank sets agricultural credit disbursement targets to encourage banks to venture into this sector and provides refinancing facilities to the participating banks. The disbursement target for agricultural loans from State-Owned Commercial Banks (SCOBs) and State-Owned Specialized Banks (SCSBs) has been fixed at 42.01% and for Private Commercial Banks (PCBs) & Foreign Commercial Banks (FCBs) at 57.99%. [8]

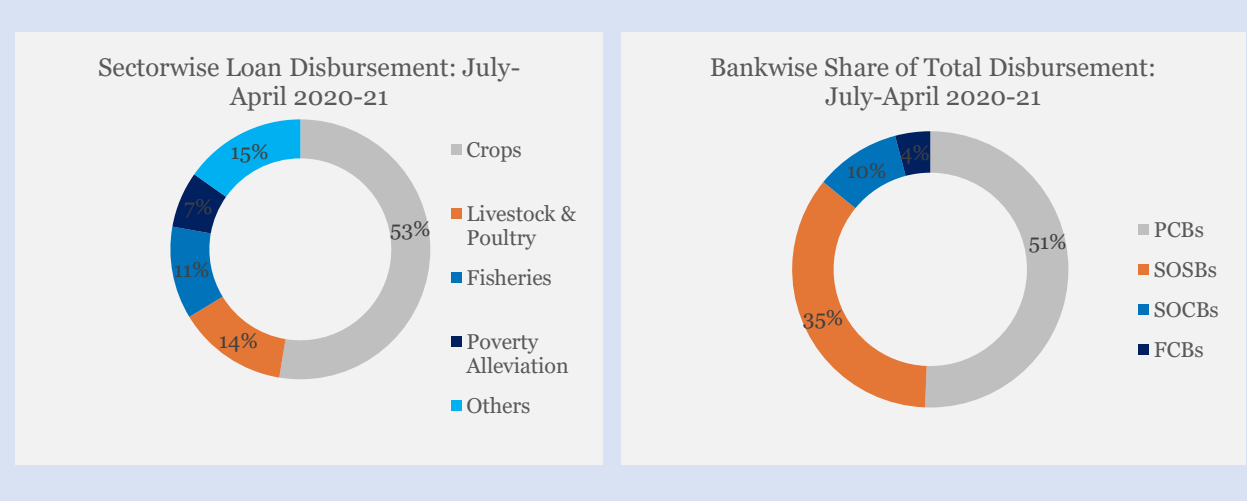


Figure 1: Sector and bank wise loan disbursement

Source: Agricultural Credit Department, Bangladesh Bank; Note: Others include a % allocation for irrigation equipment

Alongside, there are challenges faced by the agricultural machinery value chain players to access finance from formal institutions which will be explored further in the upcoming chapters. Given the difficulties faced by agri-machinery value chain actors to invest in farm machinery through leveraging finance from formal institutions, CSISA-MEA wants to bridge the gap between financial actors and the agri-machinery value chain actors. The ultimate goal is to promote the manufacture of quality agricultural machinery and spare parts within Bangladesh and to promote the use of agricultural machinery. It is expected that this will create regional employment and raise agricultural resilience and productivity.

[7] SME Finance Forum, (2020). MSME Finance Gap. Available at: https://www.smefinanceforum.org/data-sites/msme-finance-gap

[8] https://www.bb.org.bd/pub/monthly/agri_rural_financing/agri_apr_2021.pdf

1.2. Project background

The Feed the Future Bangladesh Cereal Systems Initiatives for South Asia Mechanization Extension Activity (CSISA-MEA) is a five-year project, funded by USAID and implemented by CIMMYT and its partners: iDE and Georgia Institute of Technology (GT). CSISA-MEA's objective is to enhance agricultural resilience, productivity and profitability by enhancing mechanization of the agriculture sector. To do this it is recognised that, amongst many other factors, there will be a need to support the agricultural machinery manufacturing and service provision sectors to gain improved access to finance. To this end, LCP have been contracted to conduct a study of financial services for the agriculture machinery manufacturing, marketing and service provision sectors.

1.3. Broad objectives of the study

The findings from this study will describe the current financing options for agricultural machinery value chain actors identify their financing needs, the constraints they face in meeting these needs and the actions CSISA-MEA could take to support the key institutions such as the financial services sector and government institutions resolve these constraints and, through this, improve the provision of finance to the agricultural mechanization sector.

Therefore, the key objectives of this project are outlined below:

- To understand and assess the bottlenecks in the current agricultural machinery manufacturing, marketing and service provision sector financing landscape

- To suggest ways to overcome bottlenecks in the current financial system and come up with feasible/innovative financing solutions to develop, expand and improve the efficiency of agricultural machinery and spare parts manufacture and encourage the greater provision of agricultural mechanization services to farmers.

- To provide action-oriented recommendations primarily for CSISA-MEA project and its stakeholders which will help develop partnerships in the future

1.4. Methodology and limitations

Approach of Research Design

A market systems approach will be adopted where the activities of the demand side actors in the 'agri-machinery landscape' and the suppliers in the 'financial sector landscape' will be evaluated. In addition, the role of ecosystem builders in bridging the gap between the two aforementioned landscapes will be explored to seek innovative and feasible financing options.

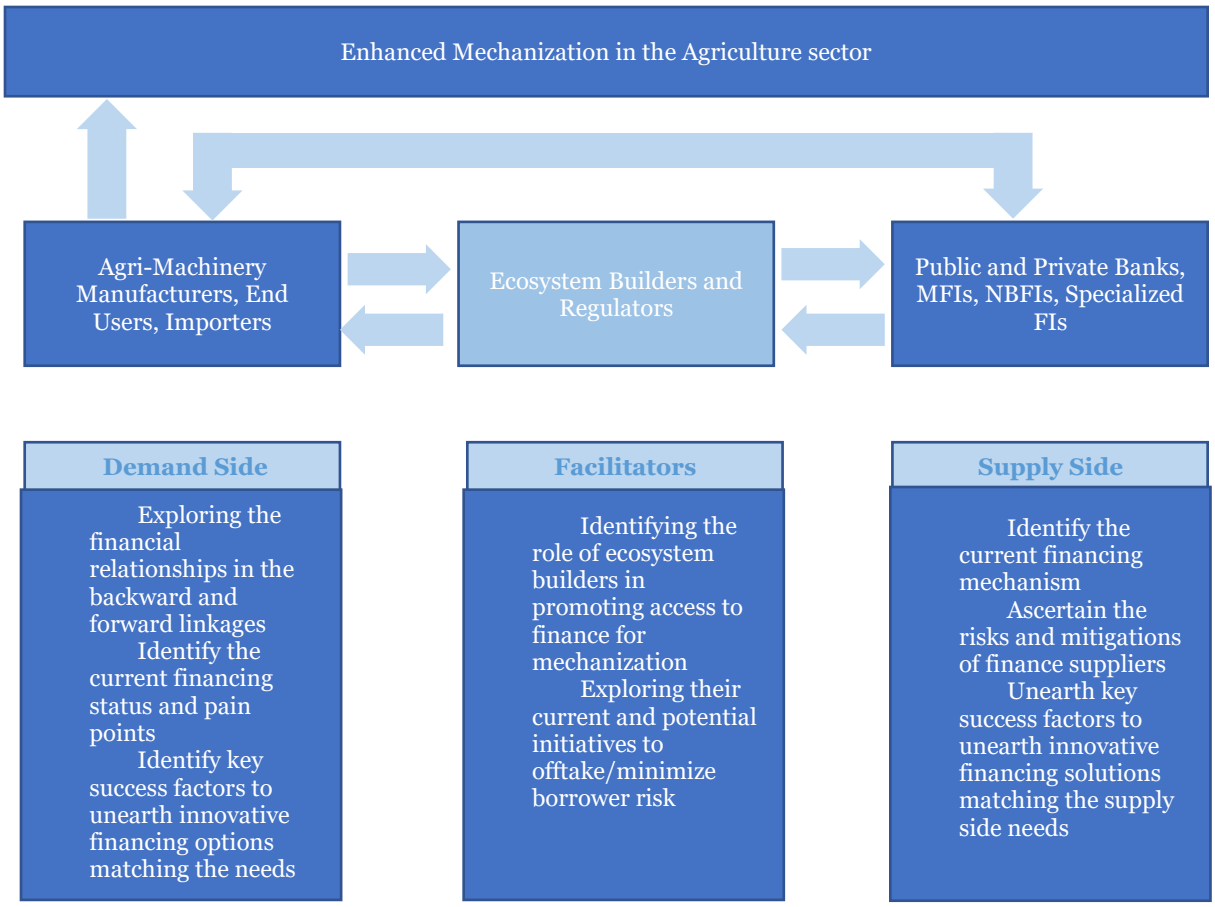


Figure 2:: Approach of research design

Classification of Stakeholder Type and Objective Mapping

For the purpose of the study, the stakeholders are clustered as agri-machinery value chain actors, financial actors, and ecosystem builders

Agri-machinery Landscape Value Chain Actors

Stakeholder Type	Objectives to be met
Manufacturers - Engineering Workshops (ABLE SMEs)	• Understanding the financial and non-financial constraints to business expansion • Current status and sources of finance • Bottlenecks in the current financial system • Mechanism of credit sale to customers and their credit recovery track
Manufacturers-Foundry & Engineering Workshops (MSME)	• Understanding the financial and non-financial constraints to business expansion • Current status and sources of finance • Bottlenecks in the current financial system • Mechanism of credit sale to customers and their credit recovery track • Credit recovery behavior of customers

Stakeholder Type	Objectives to be met
Dealers	• Understanding the financial and non-financial constraints to stocking machinery • Potential role of dealers in facilitating access to finance to their customers • Mechanism of credit sale to customers and their credit recovery tracks
Importers and Marketeers	• Current system of credit facility extension to customers • Bottlenecks in the current financial system for accessing finance • Loan recovery strategies undertaken by the machinery companies
Machinery Service Providers	• Understanding the financial and non-financial constraints to purchase machinery • Mechanism of credit sale to customers and their credit recovery tracks • Demand for credit among customers

Table 1: Agri-machinery value chain actors

Financial Landscape Value Chain Actors and Ecosystem Builders

Stakeholder Type	Objectives to be met
Banks (public and private) and NBFIs	• Present challenges for banks/NBFIs to extend credit for agri-machinery purchase • Parameters that hinder loan extension to MSMEs • Suggestions to make agri-loan disbursement more profitable for banks
MFIs, DFS and Agent Banks	• Explore potential partnership with banks/NBFIs to strengthen micro-credit and digital channels for lending • Effect of interest rates and other factors affecting the loan disbursement
Regulatory Bodies	• Understanding the long-term vision regarding the agri-machinery financing landscape • Challenges and opportunities in the existing context at policy support level • Identify and assess prospective policies to support agri-sector financing for all the value chain actors from manufacturers to machinery service provider
Development Agencies	• Gather feedback and lessons learnt from project experiences • Identify existing bottleneck and potential interventions across the agri- market system

Table 2: Financial landscape value chain actors and ecosystem builders

Research Methodology

The study adopted a mixed approach using both qualitative and quantitative data. The 4-step methodology along with key deliverables at each step are identified below:

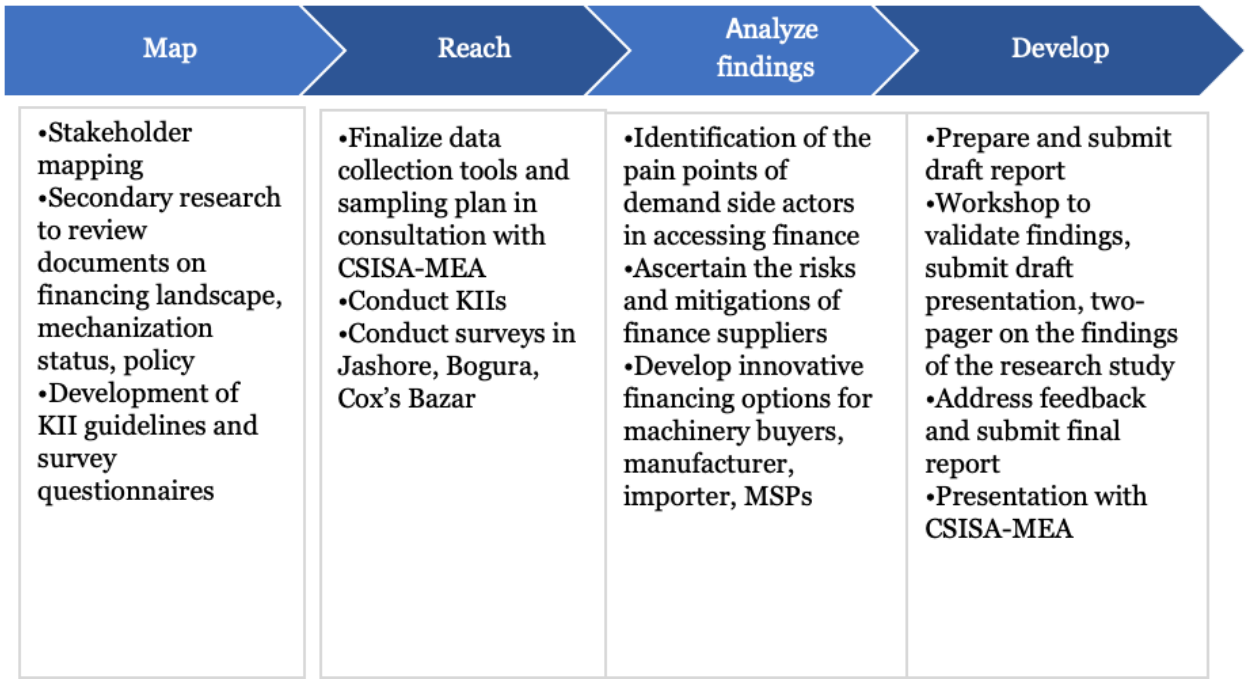


Figure 3: Research methodology

The study was initiated with secondary research of available reports from the Central Bank, Government websites, international journals, along with published reports on mechanization and financing from development agencies. Through the robust secondary research process, LightCastle Partners (LCP) prepared research instruments and validated them with the CSISA-MEA team before moving onto data collection in 3 different regions (Jashore, Cox's Bazar, Bogura).

Data collection involved conducting KIIs, surveys, and FGDs across all the relevant stakeholders to validate the findings. The findings were combined to identify the bottlenecks in the financing system for each of the stakeholder groups. From there onwards, a market systems approach was used to match the needs of the supply and demand side actors.

Stakeholder List for Data Collection

The list of stakeholders includes Agri-Machinery sector players, Financing Counterparts and Ecosystem Builders of the agri-machinery landscape. The insights collated from these groups were utilized to validate the development needs, assess the bottlenecks and propose ways to overcome them in the current system. The agri-machinery sector players are: ABLE SMEs, Machinery Service Providers, Dealers, Medium foundry, Machinery Importers and marketeers. Financing counterparts include: Banks (PCB and SOB), NBFI, MFI, DFS, Agent Bank, and the national NGO, PKSF. Among the ecosystem builders are Bangladesh Bank, MRA (Microcredit

regulatory authority), Development agencies, Department of Agricultural Extension and Bangladesh Agriculture Machinery Merchant Association.

Surveys were conducted for ABLE SMEs, small foundry, MSPs and Dealers with the help of the existing CSISA-MEA database. Data was collected through conducting KIIs with the other stakeholders as outlined in the table below:

Stakeholders		Medium of Data Collection
Financial System Actors	Private Commercial Banks	4 KIIs
	State Owned/Public Banks	2 KIIs
	NBFI	1 KIIs
	DFS	1 KIIs
	Agent Bank	1 KII
	MFIs	3 KIIs
Machinery Value Chain Actors	Manufacturers - Foundry & Engineering Workshops	30 Surveys
	MSPs	90 Surveys+2FGDs
	Dealers	15 Surveys
	Manufacturers & machinery importers - Medium to large scale Foundry & Engineering Workshop	30 Surveys
	Machinery importer and marketeers	4 KIIs
Ecosystem Builder	Bangladesh Bank	1 KII
	MRA	1 KII
	BEIOA	1 KII
	Development Agencies	1 KII
Total	**165 Surveys, 20 KIIs, and 2 FGDs**	

Table 3: List of surveys, KIIS & FGDs

Development of Data Capture Instruments

The questions were organized to meet the core objective of the study and validate the findings. The questionnaires have been built keeping the core objectives in the forefront. The LCP team has identified 16 groups of stakeholders to be consulted and thus separate instruments for KII and Surveys have been prepared.

a. Surveys were conducted for **ABLE SMEs (Workshops), ABLE MSMEs (Foundries), MSPs and Dealers.** The questionnaires have been developed with the aim of understanding the financial and non-financial constraints, current status and source of purchasing machinery. The instrument is designed to also look into their present sources of financing the business and barriers to expansion.

b. KII guides are meant to be semi-structured and aimed to allow both the interviewer and interviewee substantial flexibility to discover new topics and motives while also revealing

information directly related to key research themes. LCP team will attempt on a best effort basis to interview the following stakeholders: Companies Importing and Marketing agricultural machinery, Banks (PCB and SOB), NBFI, MFI, DFS, Agent Bank, PKSF, Bangladesh Bank, MRA, Development agencies, Department of Agricultural Extension and Bangladesh Agriculture Machinery Merchant Association.

c. A separate instrument has been developed for conducting FGDs of Machine Service Providers. MSPs are a large part of the ecosystem. Since there are as many as 4004 MSPs within the sampling frame, and the LCP team is reaching out to a relatively small sample, the FGDs are proposed to be done with the purpose of gathering useful qualitative information, validating the data collected through surveys and thereby reducing possible errors. As CSISA-MEA is only working with machinery manufacturers (ABLE MSMEs) and not with MSPs in Bogura FGDs with MSPs were only done in Jessore and Cox's Bazar.

Sampling Plan for Surveys

The sampling approach to be followed is stratified random sampling. Based on the sampling frame database that has been shared by the CSISA-MEA team, LCP categorized the type of stakeholders for the survey according to business size for ABLE SME and MSMEs, machine size for the MSPs, and type of ownership for the dealers. It is worth mentioning that a random sampling frame has been shared by the CSISA-MEA team for determining the size of the sampling frame.

Breakdown of Stakeholders

The following table shows the category of stakeholders for the survey. While SME and MSMEs are defined by the employee numbers, the MSPs are categorized as Type 1,2, and 3 according to the value of investment in the machines.

Stakeholder Category	Definition
Manufacturers-Foundry & Engineering Workshops (MSMEs or Workshops)	• Micro has less than 10 employees • Small has 10-49 employees
Manufacturers & machinery importers - Medium to large scale Foundry & Engineering Workshops (SMEs or Foundries)	• Medium has 50-249 employees • Large has 250 and above employee
Machinery Service Providers (MSPs)	• Type 1 has low-cost machine less than BDT 100K • Type 2 has medium cost machine BDT 100-500K • Type 3 has high-cost machine above BDT 500K
Dealers	• Company dealers • Independent dealers

Table 4: Defined list of Stakeholders

Based on the above categorization, samples were selected randomly for data collection through surveys and will help avoid any bias in conducting the study. As such, the next section will identify the individual level of stakeholders that were consulted and the number of responses that were collected for each in the study locations (**Bogura, Jashore, and Cox's Bazar).**

Stakeholder wise breakdown	Size of the sampling frame	Proposed Sample Size	Sampling %	Methodology of data collection
Workshops	130	30	23.1%	20 Field surveys+10 Phone Surveys
Foundries	41	30	73.2%	10 Field surveys+20 Phone Surveys
MSPs*	Type 1: 2829	30	1.1%	20 Field surveys+70 Phone surveys+2 FGDs to validate findings
	Type 2: 841	30	3.6%	
	Type 3: 334	30	9.0%	
Dealers	155	15	9.7%	5 Field surveys+10 Phone surveys
Total		**165**		55 Field Surveys+110 phone surveys+2 FGDS**

Table 5: List of stakeholders & respective sample size

*Total 90 MSPs ** FGD participants are not counted as part of the sample of 90 since it will only be used for validation purposes through a semi structured questionnaire.

Sampling Split Location wise

The surveys were conducted in the 3 locations and the sample split was considered in discussion with the CSISA-MEA field team as well as the database received from them. In conducting the surveys, the CSISA-MEA field team conducted 11 to 12% of the total surveys i.e.18 surveys across 3 locations. These 18 surveys may have been resampled later depending on the quality of data received.Since the data quality was up to the mark, these were not resampled. As such, the sampling split is as follows:

Location	Jashore		Bogura		Cox's Bazar		Total
Stakeholder	LCP	CSISA-MEA	LCP	CSISA-MEA	LCP	CSISA-MEA	
Workshops	11	3	8	3	3	2	30
Foundries	14	0	16	0	0	0	30
MSPs	40	4	0	0	41	5	90
Dealers	7	0	0	0	7	1	15

Total	**72**	**7**	**24**	**3**	**51**	**8**	**165**

Table 6: Sampling split by location

2 FGDs of MSPs were conducted in Jashore and Cox's Bazar to triangulate the findings from surveys. In this regard, CSISA-MEA also recruited participants for the FGDs.

Quality Assurance

To maintain fieldwork quality, the LCP team took a random sample to 10% of respondents interviewed by telephone and another 10% sample who were physically interviewed to verify that the survey had been done correctly and accurately. If any anomaly was found at the time of accompaniment, it has been corrected and the interviewer has been debriefed after completion of that interview. Any discrepancy found during the time of follow-up cross checks were corrected.

Data Collection Method and Analysis

The KIIs were conducted in person and in virtual settings. All qualitative data were transcribed, where necessary. At times, the team used recording devices to record the KIIs, if required, and use in-house resources to clean and transcribe all data in English. A mixed approach of face to face and over the phone were taken for the surveys. The data from the surveys was analyzed using Microsoft Excel. Given the sample size, if needed, the data will be extrapolated to represent national level findings. While the surveys were translated to Bengali for ease of data collection, the data entry was in English. All data was cleaned and analyzed for generating quantitative insights.

Limitations of the Study

Of the KIIs, 5 were not done as the respondents were not available but as the majority of the respondents from each stakeholder type were interviewed it was considered the findings from the survey reasonably representative. In terms of survey data collections, the Workshops, Foundries, and MSPs did not have proper record keeping of earnings and costs and hence they often found it difficult to recall some numbers.

Chapter 2: Findings from Secondary Research

2.1. Status of Agricultural Mechanization in Bangladesh

Current level of Agricultural Mechanization in Bangladesh

Agricultural Mechanization is a process where modern machines and equipment are used in farming to make farming more efficient and productive. Mechanization also reduces farmers' vulnerability to labor shortages and in many cases, natural calamities[9]. 13.24% of the country's GDP in 2020-21 has been projected to come from agriculture; with 6.94% coming specifically from crops and horticulture[10]. The figure for labor force employed in Agriculture (of total employed) has been on the decline in the recent years, but still very significant at 38.58% in 2019, against a global average of 26.86%[11]. Hence, development of the agriculture sector is a key factor in national economic growth; and mechanization improves the efficiency, productivity and value of agricultural production. This has been reflected in the National Agricultural Mechanization Policy document drafted in 2020[12]. The document highlighted the potential impact of scaled mechanization and simultaneous development of the technical and financial support systems.

Crop cultivation requires specific operations to be performed in phases. The main activities are: land preparation, irrigation, planting, applying fertilizer and pesticides, weeding, harvesting, threshing, drying processing, storing and marketing. There are specific machines to increase efficiency of each operation. At present in Bangladesh, operations that are most heavily mechanized (over 90%) are land preparation, irrigation, threshing and pesticide application[13]. The rates of mechanization during planting and harvesting are below 2%; that of fertilizer application and weeding are higher (weeds in many crops are now controlled with herbicides which are a pesticide), but still below 10%[14]. A breakdown of the market size shows the highest contribution to the market size comes from power tillers (USD 70.31 Million), four-wheel tractors (USD 120.00 Million), combine harvesters (USD 40.63 Million), irrigation pumps (USD 140.63 Million), and engines (USD 300.00 Million)[15]. Hi-tech machinery like combine harvesters are imported with a minimum tax, however, taxes for spare parts of machinery are relatively high (at

[9] J.C. Negrete, Research Trends and perspectives of mechanization and agricultural machinery in Mexico for the 21st century, J. Agri. Crop Sci. 1 (2018) 29–38, https://doi.org/10.31872/2019/JACS-100105
[10] Bangladesh Bureau of Statistics, 2021
[11] https://thefinancialexpress.com.bd/views/youth-engagement-in-agriculture-in-bangladesh-1598632102
[12] MoA, National Agricultural Mechanization Policy 2020, Ministry of Agriculture, Government of the People's Republic of Bangladesh, 2020.
[13] M.A. Hossen, Mechanization in Bangladesh: way of modernization in agriculture, Int. J. Eng. Trends Technol. 67 (9) (2019) 69–77.
[14] S. Seraj, Agricultural Machinery: Where Is Bangladesh Heading? The Daily Star, 2020. https://www.thedailystar.net/country/news/agricultural-machinery-where -bangladesh-heading-1927969
[15] Rahman, Anisur & Ali, Md & Kabir, Md & Rahman, Md & Al Mamun, Muhammad Rashed & Hossen, Md. Anwar. (2020). Agricultural Mechanization in Bangladesh: Status and Challenges towards Achieving the Sustainable Development Goals (SDGs). Ama, Agricultural Mechanization in Asia, Africa & Latin America. 51. 106-120

least 20%). Even though the Government of Bangladesh subsidises machinery purchase, there are no additional incentives on interest rates for agricultural loans and not enough accessible institutional training facilities to enhance the skills of technical manpower.[16] As such, there is significant room for increasing machinery adoption.

Importance of Agricultural Mechanization

A large contributing factor to the graduation of Bangladesh in 2020 to a middle-income country was the migration of rural labor to cities over the past three decades. A huge portion of unskilled agricultural laborers have switched to working in the RMG sector where the demand for cheap labor was very high. As a consequence, a shortage of agricultural laborers has developed in the rural areas, particularly at peak labor demand times such as during planting and harvesting. Production becomes expensive due to the labor crisis and high wages. These operations, being very time sensitive, are bound to cause even more problems for farmers. Reduced availability of laborers might lead to late planting or harvesting, which further exposes farmers to risks of natural calamities or low yield. Manual planting in Bangladesh requires around 123-150 man-hour/hectare while mechanical transplanting with a four-row walking transplanter would take 9-11 man-hour/hectare[17]. Apart from higher productivity and efficiency, mechanization also contributes to preventing loss of crops. A delay of one month in transplanting can reduce yield by 25% and that of 2 months can reduce 70% of the total crop yield[18]. Mechanization changes crop yield drastically for the better. A study titled "*On- and Off-Farm Mechanization in Bangladesh: A Sustainable Approach to Ensure Food Security"* conducted by the Bangladesh Agricultural University on rice cultivation has shown that using seed planters, transplanters and harvesting machines, the cost of each operation could be brought down by at least 50%[19]. Cultivating one bigha (33 decimals) of land using a plough costs tk. 2000 (USD 23.33). If done using a power tiller or a tractor, the cost comes down to Tk. 1500 (USD 17.5) and Tk. 600 (USD 7.0) respectively. In case of manually harvesting paddy, it costs Tk 2,000 on one bigha of land. It costs Tk 500 (5.83 USD) if done with a combine harvester[20]. These machines also take up much less time and raise cropping intensity, increasing profitability of farmers.

Challenges to Agri-Mechanization

Bangladesh faces a number of operational and financial challenges to promoting nationwide mechanization. They can be broadly classified as follows:

[16] Hossen, Md. Anwar et al. Mechanization Status, Promotional Activities and Government Strategies of Thailand and Vietnam in Comparison to Bangladesh. AgriEngineering. 2. 489-510. 10.3390/agriengineering2040033

[17] A.K.M.S. Islam, M.A. Rahman, M.T. lslam, M.I. Rahman, Techno-economic performance of 4-row self-propelled mechanical rice transplanter at farmers' field in Bangladesh, Progressive Agric. 27 (3) (2016) 369–382,

[18] M.V. Rao, S.N. Pradhan, Cultivation Practices, Rice Production Manual, ICAR, 1973, pp. 71–95.

[19] Dr. Saha, On- and Off-Farm Mechanization in Bangladesh: A Sustainable Approach to Ensure Food Security, https://postharvestinstitute.illinois.edu/bangladesh-virtual-workshops/

[20] https://www.thedailystar.net/country/news/agricultural-machinery-where-bangladesh-heading-1927969

Ready to use, agricultural machinery of competitive quality is not being produced domestically

The local foundries and agricultural machinery manufacturing industries mainly make spare parts and small machines like harvester, rice milling machine, sprayer machine, thresher and shallow tubewell irrigation pumps. The annual estimated market size of AM and spare parts in the country is about US$ 802.3 million with an US$ 105.2 million annual repair and maintenance service market, estimating an annual total AM market size of about US$ 907.5 million of which local production market share is about US$ 402.7 million. The spare parts market size in the country is about US$ 309.3 million of which domestic production of spare parts is estimated at US$ 237.9 million[21]. Absence of modern capital machinery at the producers' level, quality checked materials in production, high price and dependency on imported raw materials[22].

Demand side players currently face barriers to accessing finance from formal institutions limiting their ability to ramp up agri-mechanization

The farmers' inability to come up with the cost of the machinery is a huge constraint in mechanization. The GoB has provided 70% and 50% subsidies (based on regions) on selected machinery but even after the assistance, farmers struggle to bear the rest of the cost. A major machinery manufacturer opined that banks need to grant farmers better suited loan schemes in order for them to purchase the machinery[23]. Lack of access to finance from traditional financial institutions also leads many farmers to borrow from informal money lenders or loan sharks, who typically provide faster access but at a much higher cost of fund, decreasing their ability to save money for mechanization in the future[24]. Even in the formal sector, most agri-loan products in Bangladesh do not consider the cultivation period of crops. Many farmers take additional loans at higher rates (from MFIs or informal lenders) to pay off-season installments, driving up their cost of fund even more[25]. These contribute to a lasting poor financial condition of farmers, hindering mechanization efforts. Lack of finance to provide working capital and fund the purchase or manufacturing equipment and business premises expansion for manufacturers is also a problem, limiting their ability to supply seasonal demands for machines and parts and increase the quality and volume of production.[26].

[21] Alam, M. & khan, M. & Saha, Chayan & Rahman, Anisur & Bhuyian, M.. (2017). Manufacturing of agricultural machinery in Bangladesh: Opportunities and constraints. Agricultural Engineering International : The CIGR e-journal. 19. 122-135.

[22] M. A. Hossen, Mechanization in Bangladesh: Way of Modernization in Agriculture, International Journal of Engineering Trends and Technology (IJETT) – Volume 67 Issue 9- Sep 2019

[23] https://www.tbsnews.net/economy/farm-mechanisation-awaits-investment-boom-326182

[24] https://www.newagebd.net/article/70388/loan-sharks-prey-on-people-affected-by-disasters-in-bangladesh

[25] Shawkat Hossain, Zunaed Rabbani, and Shahran Ahmed, 2021, Increased Access to Finance Stakeholder Consultation Workshop

[26] Alam, M. M., M. I. N. Khan, C. K. Saha, A. Rahman, and M. G. K. Bhuyian. 2017. Manufacturing of agricultural machinery in Bangladesh: opportunities and constraints. Agricultural Engineering International: CIGR Journal, 19(1): 122–135.

2.2. Financing Practices

Bangladesh is forecasting a growth in the agricultural mechanization sector due to the growing involvement of the younger generation, however, crucial stakeholders in the sector still face financial constraints.[27] It has been seen that small firms rely more on their own funds as they find the collateral taken by banks to be significantly higher than the repayable amount. In a study conducted by IFC, it has been seen that 55% of the MSMEs are partially financially constrained while 39% are fully constrained. Current credit facilities in the sector do not have any product with medium to long-term tenure and it has also been reported that the interest rate elasticity of the sector is high[28].

Current Local Financing Models

Agriculture Machinery Loan Landscape of Banks, NBFIs and MFIs

The Government of Bangladesh approved a project of BDT 3,020 Crore in the year 2020 to accelerate the machinery purchase of farmers. This scheme is planned to help farmers buy sophisticated machinery at a subsidized rate of 50-70%. However, farmers often find it difficult to pay the rest of the amount[29]. Banks in Bangladesh provide specialized agricultural loans to farmers at an average interest rate of 8%[30]. Krishi Bank, the only government owned bank specialized for farmers with an agricultural loan disbursement target of BDT 60 billion for the FY 2021-22, offers a credit program farm and irrigation equipment at a lending rate of 8%[31]. On the other hand, local banks like EXIM Bank and BRAC Bank have dedicated schemes called 'EXIM Krishan' and 'Tara" (women-based agricultural loans) that provides loan of up to BDT 20 lacs and BDT 50 lacs at an interest rate of 8% and 7%, respectively[32]. ABLE enterprises generally take SME loans from FIs. BRAC Bank currently has an unsecured loan called "Anonna" that can provide loans from BDT 4 lac to 15 lac at 9% interest rate with the possibility of customising repayment method according to the seasonal variation in cash flow[33].

Similarly, Non-Banking Financial Institutions (NBFIs) do offer agricultural financing products but at a higher lending rate[34]. On an average, agricultural machinery loans from NBFIs have an interest rate of 14-15%, however, they offer a longer tenure and a higher loan amount than banks. Institutions like IPDC and Midas have their own lease financing program specialized for equipment purchase with tenures ranging from 1 to 5 years[35] [36].

[27] https://www.ifarmer.asia/blogs/18
[28] Andrianaivo, M., Skamnelos, I., & Ndiaye, A. (2018). Financing Solutions for Micro, Small, and Medium Enterprises in Bangladesh.
[29] https://www.thedailystar.net/business/news/farmers-get-loans-buy-machinery-2100297
[30] Increased Access to Finance Stakeholder Consultation Workshop, USAID
[31] https://www.krishibank.org.bd/core-business/credit-programs/farm-and-irrigation-equipment-loan/
[32] https://www.eximbankbd.com/agri/EXIM_Kishan
[33] https://www.bracbank.com/tara/home/products/52
[34] https://www.bb.org.bd/fnansys/interestlendingfi.php
[35] Lease Finance, IPDC. https://www.ipdcbd.com/home/sme#book1/
[36] https://www.mfl.com.bd/index.php/home/lease_financing

Microfinance Institutions (MFIs) in Bangladesh also provide agricultural loans, though the interest rate is often 3 times that of banks.[37]. BRAC offers a dedicated loan scheme for smallholder farmers to adapt to farming technologies called "Borgachashi Unayyon Project (BCUP)"[38]. Similarly, ASA Foundation have specialized loans for entrepreneurs, at a lending rate of 24% that declines overtime[39].

Innovative Financing Models by Social Enterprises

The following case studies below discuss the innovative financial interventions that will improve the adoption rate of machinery in the agricultural sector and also increase the efficiency of the agricultural sector as a whole in Bangladesh.

Case study 1

Country focus: Bangladesh

iFarmer and Hello Tractor will collaborate to help farmers get access to financing for purchasing tractors. Hello Tractor, being a leading Nigerian organization provides technology to connect tractor owners to small farmers. Using this technology, iFarmer (being a social enterprise) will venture into financing for agri-machinery that will provide the finance providers and receivers the ability to track and monitor the assets. The venture is expected to increase youth employment and reach a total of 1,000 small farmers throughout the country. Currently, the value of the agricultural mechanisation market in Bangladesh is USD 1.2 BN and is predicted to increase, as the youth are expected to become more involved with providing machinery services.[28].

Case study 2

Country focus: Bangladesh

Another organization named Bhalo Social Enterprises has also been providing farming services and credit facilities for farmers by collaborating with leading players in the sector like ACI Godrej, Auto Crop Care and Renata. With over 1,000 farmers served in the northern region of the country, Bhalo Social Enterprises plan to expand their services by providing farming inputs at a cheaper price, providing a credit facility with a repayment

[37] High Interest Hurts Farmers, The Daily Star
[38] Agricultural loans, BRAC. http://www.brac.net/program/microfinance/agriculture-loans/
[39] Loan Products, ASA. https://asa.org.bd/FinancialProgram/LoanProducts

period that reflects the business cycle of the farmers, and providing a range of machinery and spare parts by partnering with importers and manufacturers[40].

Case study 3

Country focus: Bangladesh

BD Venture Capital is keen on making investments in agritech and the food processing industry that will ensure a climate-resilient agricultural system. The goal is to develop agri food entrepreneurs that prioritizes on key technological interventions that will focus on vertical farming and precision farming. Additionally, entrepreneurs with a focus in integrating natural science and food technology that will promote optimal health will also get priority. Hence, agri processing entrepreneurs with technologies that have the potential to impact the agriculture sector will be lucrative for investors in this sector[41].

Policies on the Agricultural Sector of Bangladesh

In FY 2021-22 monetary policy set by Bangladesh Bank, interest rate cap on agricultural credit was reduced from 9% to 8% and has also facilitated loans at 4% interest rate for purchasing crops and agro inputs. Additionally, banks and NBFIs have been instructed to provide 50% of SME loans to cottage, micro and small enterprises by 2024. These initiatives have been outlined to increase agricultural production and income of rural people. Along with it, improved access to finance for cottage, micro, small and medium enterprises (CMSMEs) will lead to farmers gaining access to tools that will enhance their productivity[42].

In order to improve adoption of machinery in the agricultural sector, the Government of Bangladesh has strategized to market region specific appropriate models along with the provision of subsidized machinery. The government also plans to set up a machine manufacturing industry and also expand the number of spare parts that fall under tax exemption. Additionally, loan provision for agricultural machinery purchase by commercial banks, NGOs, NBFIs should have a specialized low interest rate in order to improve the mechanization status of the country[12].

International model

Case study 1

Country focus: India

[40] CSISA-MEA Six-Monthly Report. https://csisa.org/wp-content/uploads/sites/2/2021/05/210502-CSISA-MEA-SixMonthly-Report.pdf
[41] https://venture.com.bd/agritech-biotech-and-food-processing/
[42] Monetary Policy FY 2021-22, Bangladesh Bank.

The central government of India is providing a 'single window' approach to accelerate inclusive growth of agricultural mechanisation through a scheme called "Sub Mission of Agricultural Mechanisation". The core objective of the model is to ensure mechanisation of farming practices in regions with low power availability, promote custom hiring centres that offset the high cost of individual ownership, build hubs for hi-tech equipment, create awareness through demonstration activities and ensure performance testing of equipment throughout the country. The government has provided 100% assistance in providing training and demonstrating the sophisticated machinery used in farming, a key factor that have persuaded farmers about the benefit of agro mechanisation.[43].

Along with it, the current central bank of India provides agricultural mechanisation loans for an average of 10% interest rate and a tenure of 5 to 9 years. In terms of collateral, the policy states that 100% value of the loan is taken for Tractors and 150% value of the loan is taken for Combine Harvesters[44].

Case study 2

Country focus: Thailand and Vietnam

Agricultural mechanization in Thailand and Vietnam has been high and is progressing towards an inclusive growth in the long run. Core activities in farming like transplanting, reaping and weeding are heavily mechanized in these two regions. In the case of transplanting, 80% and 30% of it is done using machinery in Thailand and Vietnam, respectively. Similarly, in reaping, 90% and 57% is done using PTOS(Power Tiller Operated Seeder), Reapers, and Combine Harvester in Thailand and Vietnam, respectively. The high usage of machinery in the sector can be reflected if the policies of the two countries are investigated. Even though Thailand does not provide any subsidy on machinery purchase, they have zero taxation on agricultural machinery and spare parts and a subsidized interest rate of 4-6% on mechanization loans, along with it, local manufacturers can make Combine Harvesters at a cheaper cost. The government also prioritizes training on an institutional level, demonstrating, research and development, and location-based activities to empower local entrepreneurship. On the other hand, Vietnam follows a similar scheme, however they do have a minimum tax on farming technology and zero interest rates for new entrepreneurs purchasing new machinery. Vietnam also does not have any institutional form training program for manpower development[45].

[43] Sectorial Paper on Farm Mechanization, NABARD. https://www.nabard.org/auth/writereaddata/file/NSP%20Farm%20Mechanisation.pdf

[44] Cent Farm Machinery Scheme. https://www.centralbankofindia.co.in/en/cent-farm-machinery-scheme

[45] Hossen, Md. Anwar et al. Mechanization Status, Promotional Activities and Government Strategies of Thailand and Vietnam in Comparison to Bangladesh. AgriEngineering. 2. 489-510. 10.3390/agriengineering2040033.

Case study 3

Country focus: Zambia

In Zambia, NWK Agri-Services (NWK AS), in collaboration with three commercial banks, facilitate sustainable financing. The company negotiates loan conditions with the banks on the farmers' behalf, targeting a loan tenure of four to six years for machinery, with interest rates of 20 % (partly due to the high volatility of the Zambian currency). NWK AS pays the monthly rates to the bank on behalf of the farmers. The farmers pay NWK AS when their cash flow allows them to, usually at the end of the season. This offers farmers a buffer until harvest income arrives, and it avoids delays or defaults in repayment, which often arise when the farmers have to pay monthly rates to the banks directly. Throughout the credit period, farmers are obliged to sell all their produce to NWK AS – since loan installments are deducted from the farmers' sales revenues –and purchase all necessary inputs at regular market rates through them[46].

Case study 4

Country focus: Latin America

In Latin America, Root Capital started working with Swiss Agency for Development and Cooperation (SDC), Roots of Impact and IDB lab to develop a Social Impact Incentives (SIINC) model to promote inclusive growth of the agricultural sector. A SIINC model is an outcome-based impact financing model that disburses funding in different stages based on results. In this project, a total of USD 11.5 MN generated USD 48 MN of which 85% was received by small farmers. Additionally, the technical assistance received from IDB lab improved revenue by an average growth rate of 41%. A SIINC model generally supports businesses that lack initial financial support but are bound to grow, and once they do, they become self-sustainable in the long run[47].

Key Takeaways

As per the discussions in the previous sections, organizations in Bangladesh are focused in streamlining the usage of machinery, access to credit and monitoring assets through technological innovations. Also, venture capitalists in Bangladesh are looking for entrepreneurs who are

[46] http://nwkzambia.com NWK Agri-Services (mimeo) NWK Agri-Services (n.d.) Interviews: Knierim, 11/2015; Bertenbreiter, 10/2015; Peltzer, 09/2015

[47] https://rootcapital.org/how-we-utilize-outcomes-based-financing-to-help-early-stage-enterprises-grow/

establishing agritech and natural science in the food processing sector. On the other hand, the government of India, has been taking initiatives to expand and deepen access to agricultural machinery in places with low power availability and providing a scheme that is a complete package of services from credit awareness to training provision on machinery. Additionally, they provide credit at a higher interest rate of 10% than Bangladesh, but with a longer payment period of 5 to 9 years. This is a crucial factor for farmers in Bangladesh as they often fail to repay on time[48].

Similarly, Thailand and Vietnam have progressed significantly in the sector by gradually improving the capacity and technical knowledge to provide services for machines like Combine Harvester. Moreover, both countries have low to no tax on machinery imports[32]. On the other hand, import tariffs on agricultural machinery is low but high on spare parts in Bangladesh. Due to lack of investment on capacity building, machine users, service providers and manufacturers do not possess substantial knowledge to provide services for repair and maintenance. As a result, farmers often stop using the machine due to small faulty reasons that can be fixed easily, or they end up paying high charges[49].

[48] Mechanization for Sustainable Agricultural Intensification in SAARC Region. http://www.sac.org.bd/archives/publications/Mechanization%20for%20Sustainable%20%20Agricultural%20Internsification.pdf

[49] Farm Mechanization for Sustainable Agriculture in Bangladesh: Problems and Prospects. https://www.un-csam.org/Activities%20Files/A09105thTC/PPT/bd-doc.pdf

Chapter 3: Demand Side Analysis

3.1. Agri-Machinery Value Chain Landscape

The agri-machinery value chain consists of numerous stakeholders from regulatory authority, manufacturing association, financial institutions to manufacturers, importers, dealers and machinery service providers. In general, regulatory authorities and associations determine the rules and regulations of the market. These are followed in the value chain by financial institutions and manufacturers who provide their customers with the services they demand. Finally the MSPs purchase the machinery from dealers and manufacturers and importers that they use to provide farmers with machinery services.

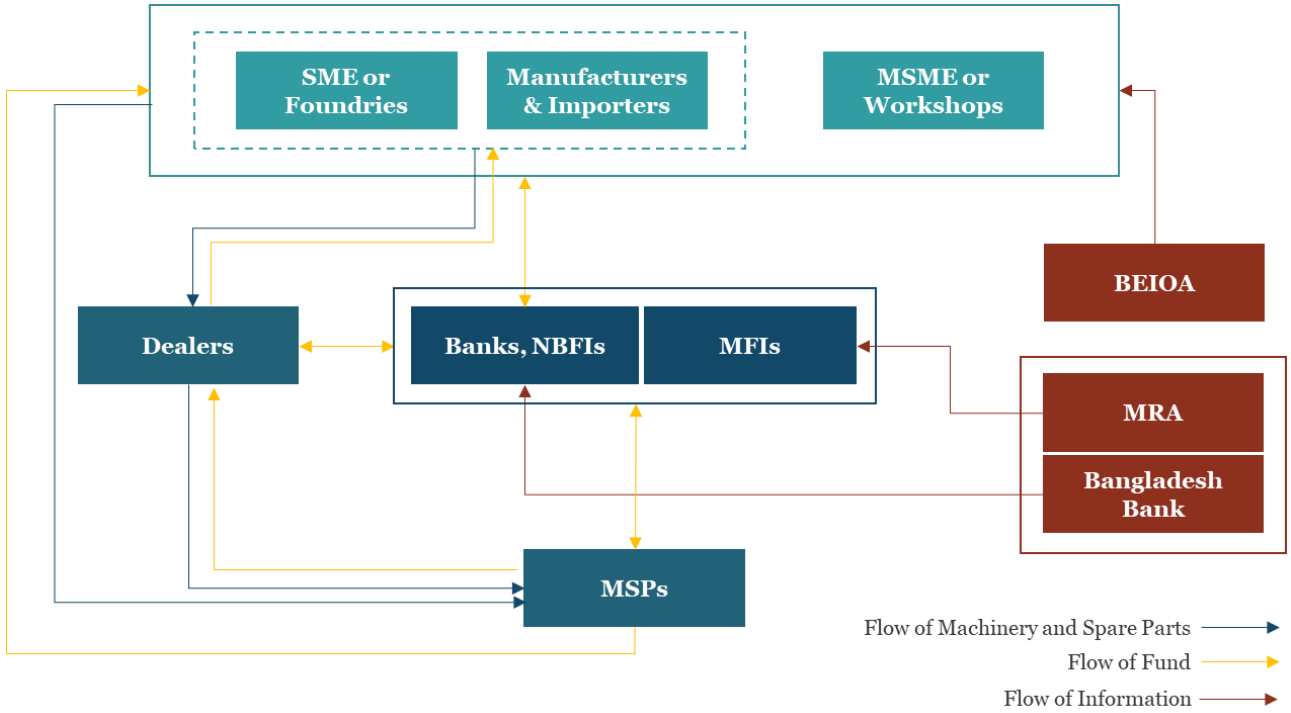


Figure 4: Agri-machinery value chain

Sampling Plan for Data Collection

In order to understand the access to finance of demand side actors in the "agri-machinery landscape", in Jashore, Bogura and Cox's Bazar were interviewed. They were:

MSME or Workshops: Manufacturer and Engineering Workshops that fix or modifies machinery

SME or Foundries: Manufacturer, Foundry and Engineering Workshops that make spare parts of machinery and fix and modify machinery.

Dealer: They sell machinery and spare parts and, in some cases, provide after-sales services such as machinery maintenance and repair services.

MSP: They are Micro-entrepreneurs who sell machinery services to farmers.

Manufacturers and Importers: They either import and market agricultural machines and spare parts or both import and manufacture and assemble whole machines, machine components and spare parts.

Location Specific Number of Surveys and KIIs Conducted

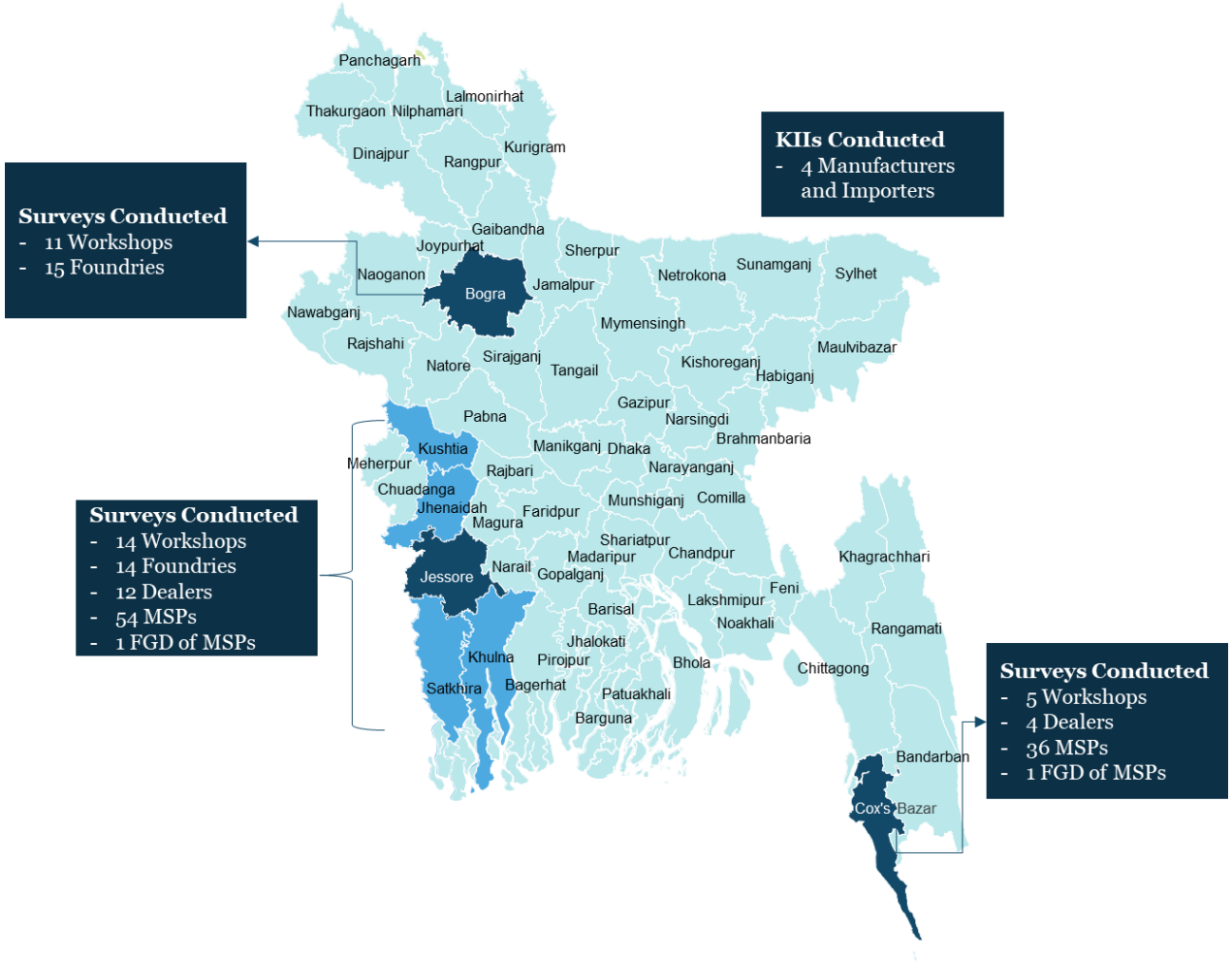


Figure 5: Location of Surveys, FGDs and KIIs

3.2. Findings and Insights from ABLE Workshops

General Business Profile

I. Customer Base and Role in the Value Chain

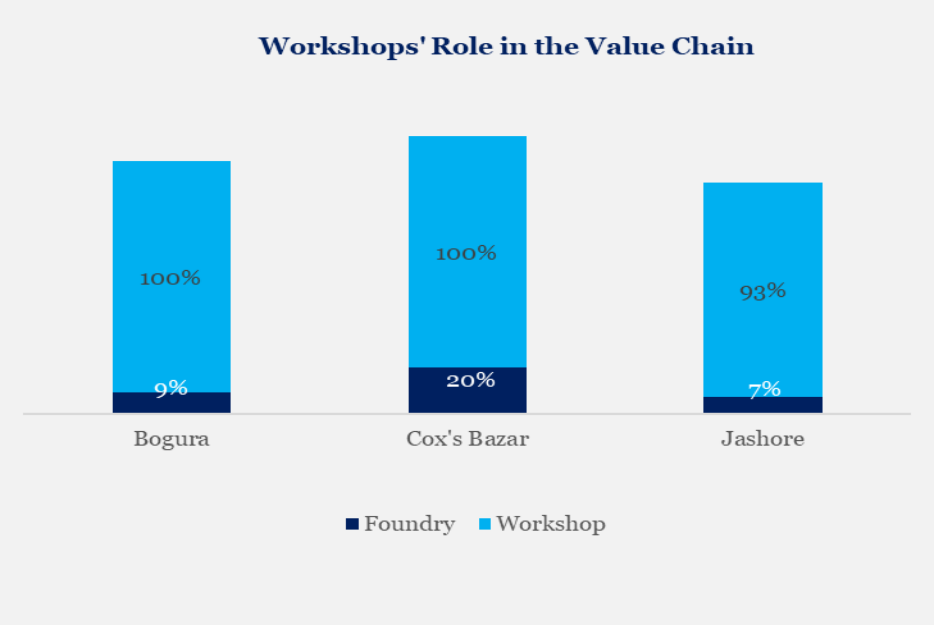


Figure 6: Workshop's role in value chain

- Workshops in the Agri-Machinery Manufacturing industry start out with assembling molten metal to produce equipment. Often, workshops undergo a backward integration to build a foundry, where they melt metal to sell and use for their own operations, working simultaneously as a Foundry and a Workshop.
- Most of the respondents were metalworking workshops. Less than 10% in Jashore and Bogura and 20% in Cox's Bazar ran foundries that produce parts from molten metal.

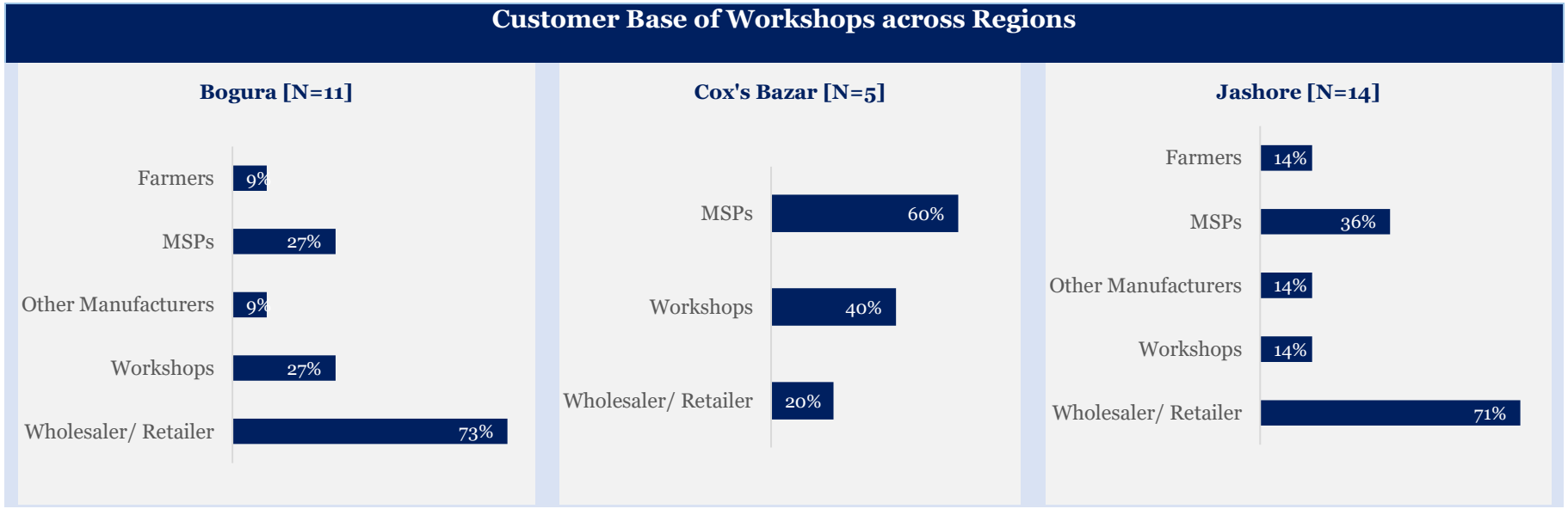


Figure 7: Customer base of Workshops

- In Bogura and Jashore, respectively 73% & 71% of sales come from wholesaler/retailer, while In Cox's Bazar 60% of sales are direct to MSPs. This might be explained by the presence of a well-established dealer and retailer network for machinery and spare parts in Bogura and Jashore regions than in Cox's Bazaar where agricultural mechanization began later and is less well established.

II. Seasonality impact on Sales

Workshops' High Sales Level by Month and Location												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bogura	55%	64%	45%	36%	27%	45%	36%	18%	18%	27%	55%	73%
Cox's Bazar	60%	60%	40%	0%	0%	0%	0%	0%	0%	40%	40%	40%
Jashore	100%	50%	25%	50%	75%	75%	75%	75%	50%	75%	75%	75%

Low Sales	Medium Sales	High Sales

Table 7: Seasonality impact on sales of Workshops

- Workshops have higher volumes of sales during November to February. Sales are typically lowest in the year during May-September. However, workshops in Jashore (75%) reported comparatively higher sales during the months of May-August. This reflects that financial products must consider the seasonality impact of the sales since the workshops only experience high sales for at most 2 to 3 months a year, whereas loan EMI has to be paid every month. Although sales vary according to months, the workshops the team conversed with reported that production is not halted even during off peak seasons since they have to have stock ready before the peak seasons.

III. Product Portfolio & Sales

Name of Machine	Bogura	Cox's Bazar	Jashore
Liner	60%	33%	56%
Piston	40%	67%	44%
Engine Driven Thresher	60%	0%	11%
Fodder Chopper	60%	0%	44%
Sprayer	0%	0%	22%

Centrifugal Pump	20%	100%	22%
Maize Sheller	40%	0%	0%
Power Tiller Trolley	0%	33%	0%

Table 8: Product portfolio of workshops

- Workshops in all the regions make machinery like sprayer and centrifugal pumps. Bogura being the biggest production hub also makes other machinery mentioned above that are not produced by workshops in Jashore or Cox's Bazar.

- Most of the complete agricultural equipment manufactured by the workshops are smaller, low-value machinery or parts such as Pumps, Liners and Pistons. In Bogura and Jashore, workshops also manufacture larger machines such as Fodder Chopper and Engine Driven Threshers. In Cox's Bazar 33% of workshops produce Power Tillers trolleys but do not manufacture components of larger machines.

Average Annual Sales (in '000 BDT) (Bogura)			
Name of Machine	**Units Sold**	**Average Price/Unit**	**Total Revenue**
Engine driven mobile multi-crop Thresher	265	85,000	22,525
Centrifugal Pump	12,000	9,000	108,000
Tube-well	60,000	2,000	120,000
Rice Thresher	160	100,000	16,000
Fodder Chopper	1,630	11,000	17,930
Power tiller Trolley	15	125,000	1,875
Maize Sheller	150	70,000	10,500

Table 9: Average annual sales of workshops interviewed in Bogura

Average Annual Sales (in '000 BDT) (Cox's Bazar)			
Name of Machine	**Units Sold**	**Average Price/Unit**	**Total Revenue**
Power tiller Trolley	5	104,000	520,000
Centrifugal Pump	35	8,000	280

Table 10: Average annual sales of workshops interviewed in Cox's Bazar

Average Annual (in '000 BDT) Sales (Jashore)			
Name of Machine	**Units Sold**	**Average Price/Unit**	**Total Revenue**
Engine driven mobile multicrop Thresher	120	45,000	5,400
Centrifugal Pump	50	12,000	600
Fodder Chopper	600	10,000	6,000
Sprayer	25,400	3,500	88,900

Table 11: Average annual sales of workshops interviewed in Jashore

- The product portfolio in Bogura is more diverse than the other two regions. Workshops in Jashore mostly manufacture spare parts such as liner, piston and whole machinery such as threshers, maize shellers and fodder choppers. Although these machines are of comparatively lower value, the largest portions of workshops' revenue come from the sales of Sprayers, Pumps and other Machinery Parts. ABLE workshops in Cox's Bazar generally repair and modify irrigation pumps and threshers and other small-scale machinery that are generally locally produced, and workers have the capacity to fix them.

Actionable Insight:

- 27 out of 30 workshops are manufacturing small agricultural equipment and parts or extensions of larger machines. For this reason, the customer base of workshops comprises a small portion of farmers.

- Perceived lack of skill and quality of production is also indicated by the low presence of other manufacturers in the customer base profile of workshops. Training and skill development of workers, along with better access to machinery financing for the owners may widen their product portfolio and help them reach additional consumers from different levels of the value chain.

Financing Needs

I. Source of Working Capital and CAPEX Funds

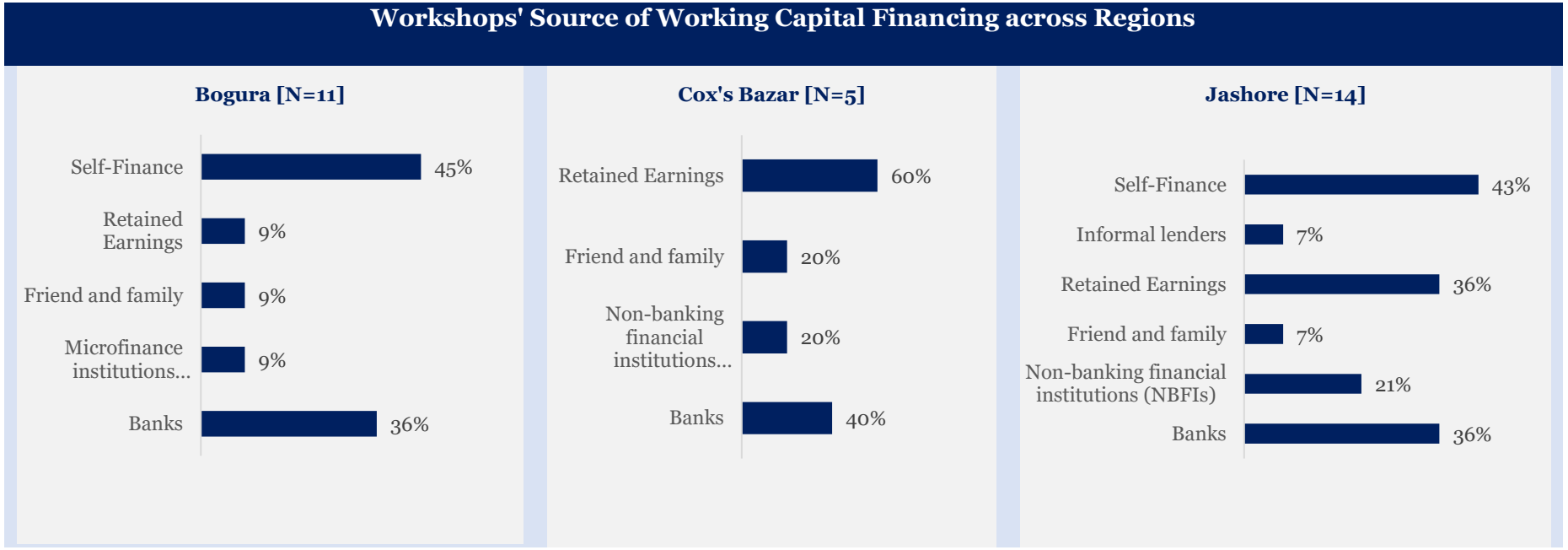
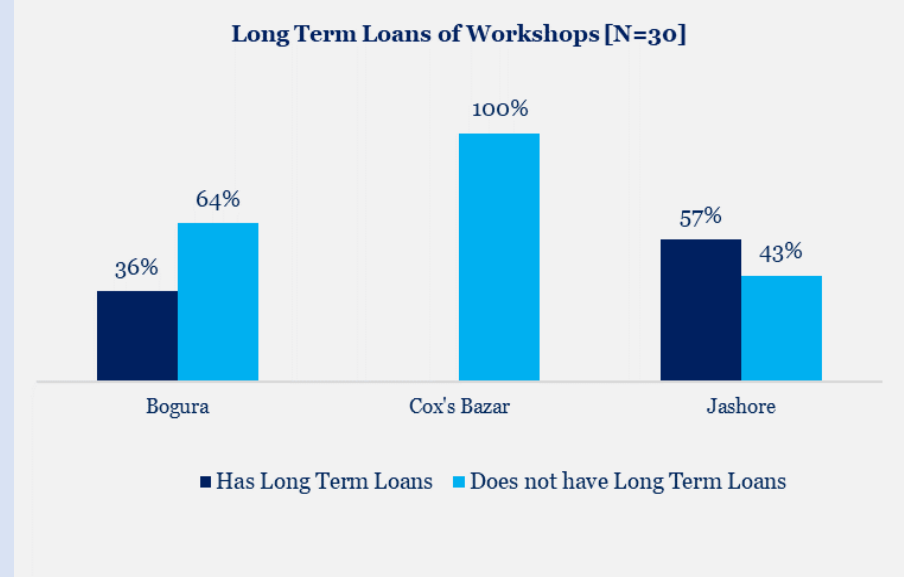


Figure 8: Workshops' source of working capital financing

- In Bogura and Jashore, 45% and 43% workshops interviewed use Self-Financing for their working capital. In Cox's Bazar 60% of respondents also dip into their retained earnings. In Cox's Bazar and Jashore, more than 50% of workshops interviewed source their working capital through loans from formal financial institutions. This shows that the workshops interviewed have banking transactions and have access to banking credit, although in conversation with workshops it was revealed that the loan amount is not enough to expand their businesses. They mostly obtain SME loans from banks. These are normally only for small amounts and not enough for business expansion.



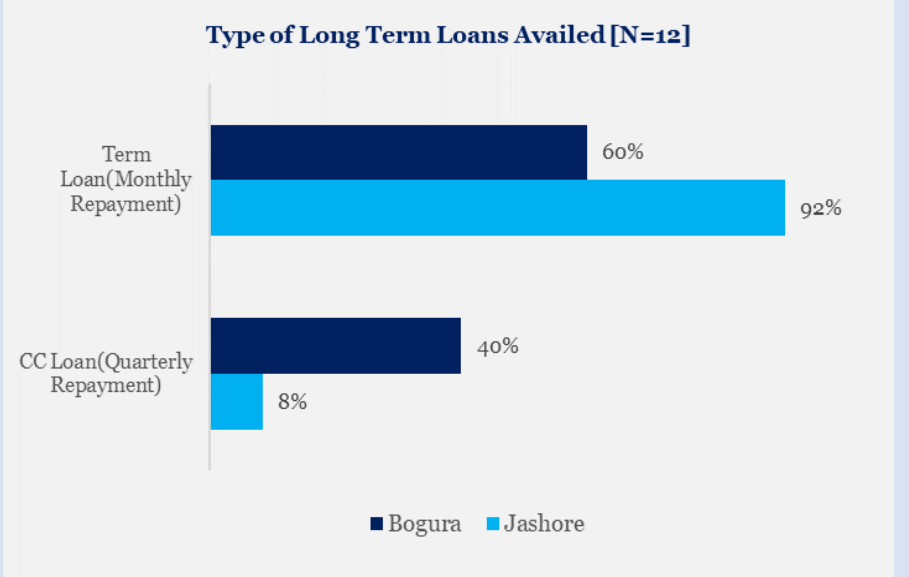


Figure 9 (a & b): Long term loans of workshops and their types

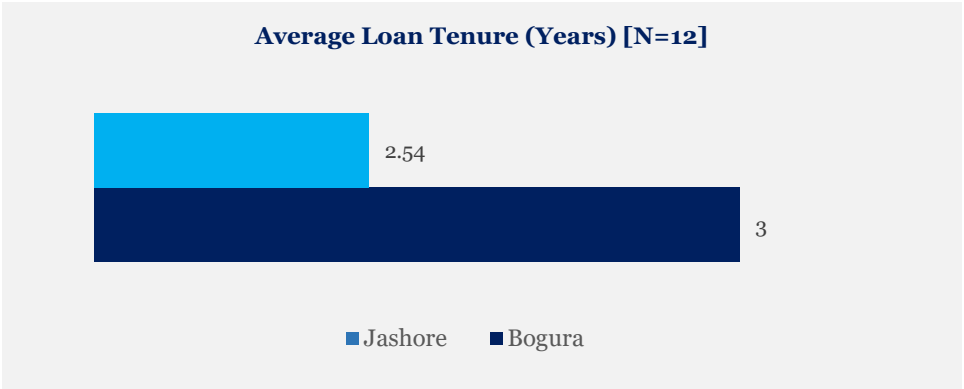


Figure 10: Average loan tenures (in years) of workshops

30 respondents were asked whether they had long term loans. The respondents with long term loans [N=12] were then asked what type of loan they had and its tenure

- workshops usually have a CC loan which is a renewable loan alongside SME loans (figure 10b) which are difficult to continue due to installment payments. However, it was seen that most of the respondents had financing from Islamic banking Brac Bank or, among the NBFIs, IDLC. By contrast, all respondents from Cox's Bazar said that they did not have long-term loans (≥ 1 Year) (figure 10a).

- A higher percentage of respondents from Jashore (57%) have long term loans compared to the other two locations. Only 8% of the loans reported taken in Jashore were Cash-Credit (CC) loans the rest were EMI Term Loans. Figure 10 shows the average tenure (in years) of the loans taken by the 12 workshops with long term loans was between 2 to 3 years, except for CC loans which must be renewed yearly. Although highest sales occur in only 2 to 3 months in the year, the loans workshops have required them to start paying installments immediately after taking the loans. It would appear that loan programs that consider the seasonality of workshop business are not available. Although sales are seasonal, these workshops require funds year-round because production level has to be maintained and workers cannot be laid off due to competing firms in the area offering higher wages to the existing workers. So workshops have to incur wage costs round the year.

II. Sales Terms and Credit Sales Mechanism

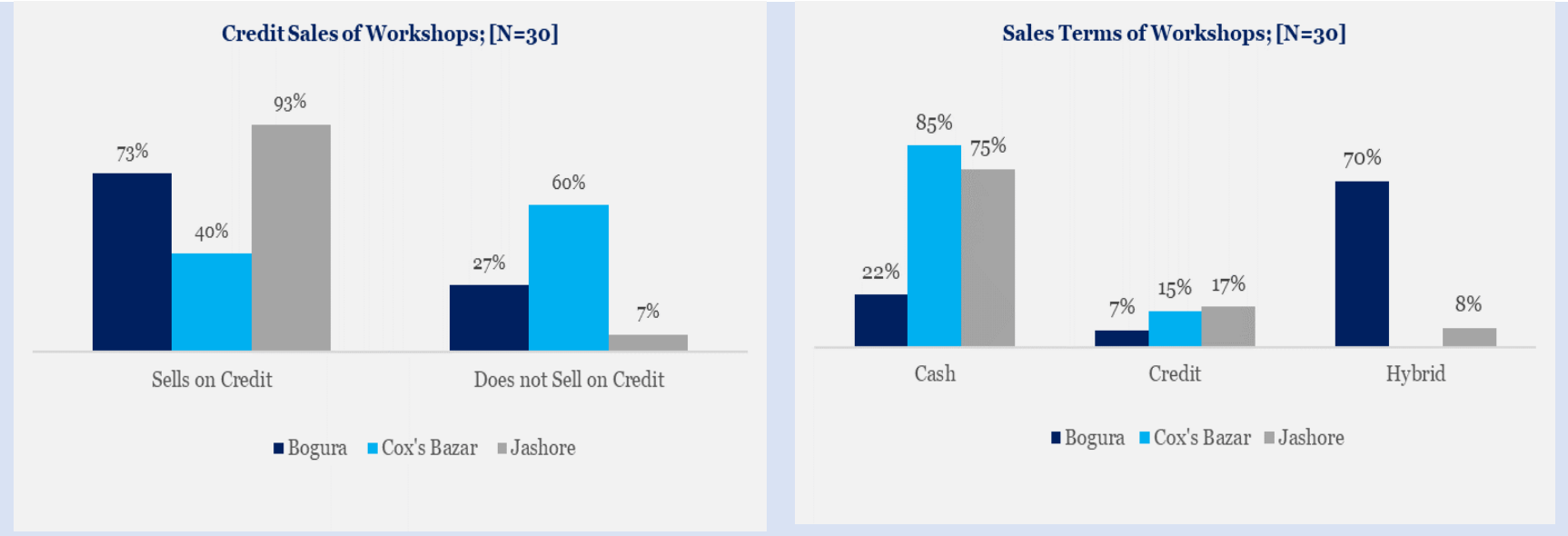


Figure 11 (a & b): Sales term and credit sales of workshops

- Majority of the workshops interviewed in Bogura and Jashore sell on credit (fig. 11a) to select customers. However, 75% of transactions in Jashore are done in cash. 70% of the respondents in Bogura have reported having a hybrid sales mechanism where they take a portion of the payment upfront and the rest in later installments. Although they would prefer more cash payment, since they all have to pay monthly installments to banks/NBFIs and therefore lending credit to their end customers will hamper the workshops' ability to repay their own loans. Therefore, for new customers, they make cash bookings for business.

- This indicates that business is heavily dependent on credit extension to its end customers. Therefore, matching the high selling months with their credit period means they have to rely on external financing for working capital, that too with long term loans, as reflected in the earlier section. In contrast 60% of the workshops interviewed in Cox's Bazar do not sell on credit. It is also reflected through a high cash sales percentage of 85%. The preference for cash is imperative since they mostly rely on their retained earnings as a source of funds.

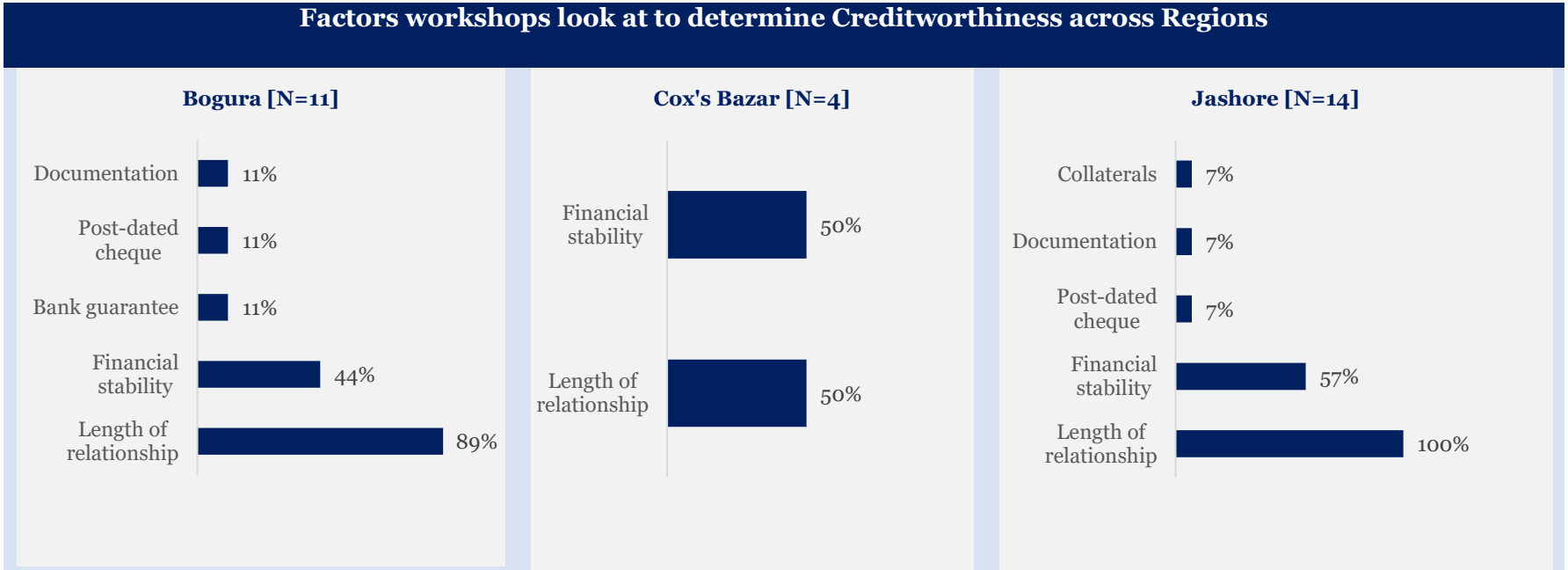


Figure 12: Factors workshops look to determine creditworthiness

- In all the three regions, credit-worthiness of customers is determined mostly through the length of relationship between the seller and the buyer and their perceived financial stability. Therefore, most workshops do cash transactions for new customers, irrespective of the type of customers.

- Usage of more formal and less risky means like Bank Guarantee, Collaterals is less prevalent among workshops in determining credit-worthiness. Although cheques are a common security document in case of large orders.

III. Future Expansion & Financing Plans

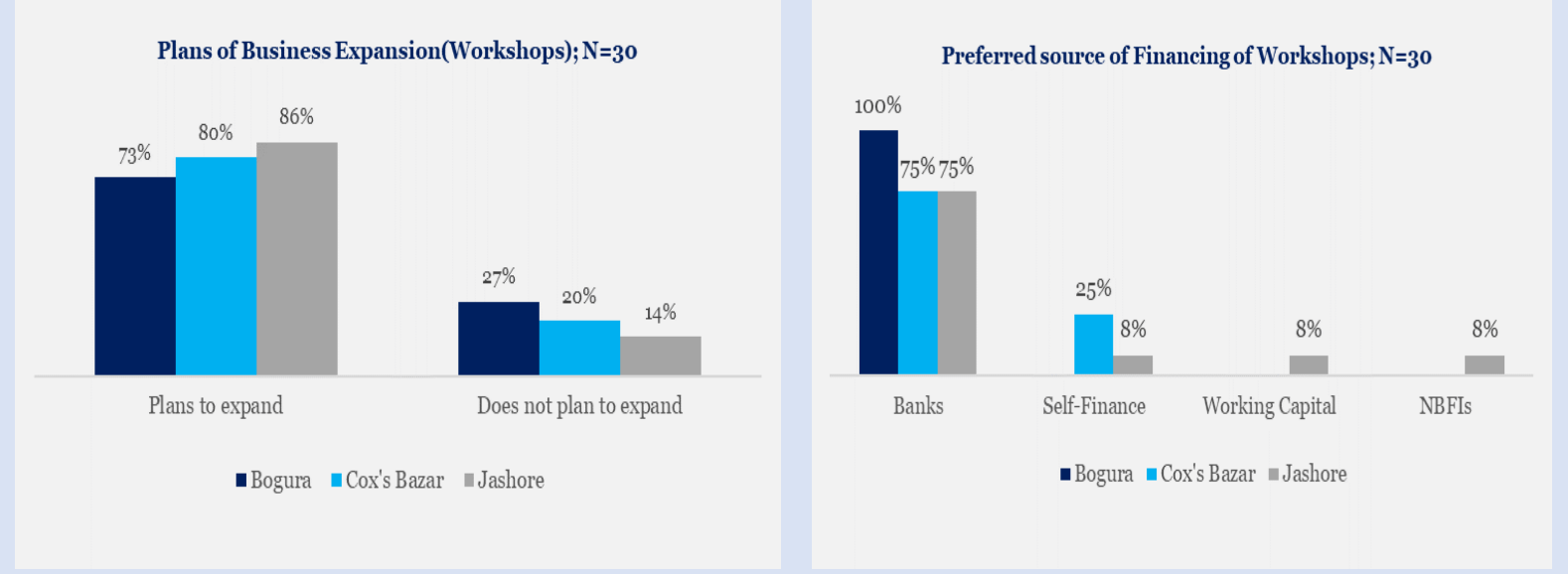


Figure 13 (a & b): Business expansion plans(a) and preferred source of finance(b) of workshops

- Over 70% workshops interviewed from all the locations responded that they have plans to expand their business. The preference across all the locations was for finance from Banks, followed by Self-Financing. In Jashore, 8% of respondents said that they prefer NBFIs to Banks for financing their business expansion. The workshops who have existing bank financing usually switch to other banks due to relationships with banks as different banks have diverse risk appetite for finance. While some banks provide loans on 50% of collateral land value, others provide upto 70% of land value.

Actionable Insights:

- It is evident from the data that most workshops prefer financing through Bank loans due to lower cost of fund. However, the majority of the SMEs are unable to secure loans from traditional financial institutions. Actions can be taken to find mechanisms to instil trust among within the financing systems.

- Although most workshops in Jashore and Bogura are willing to sell on credit, sales are mostly dominated by c ash. Having more accessible working capital financing would enable workshops to sell on credit. However, not having formalised procedures to determine customers' credit-worthiness increases risk of default.

- Credit across the value chain has dried up due to the pandemic induced credit default due to the pandemic.

Current Financing Status

I. Current Funding Sources for Raw Materials & Machinery Purchase

Material	Source of Finance	Bogura	Cox's Bazar	Jashore
Chemical	Self-Finance	67%	67%	100%
	Debt Finance	67%	0%	50%
	Credit from Supplier	100%	33%	50%
Steel	Self-Finance	100%	67%	57%
	Debt Finance	0%	0%	29%
	Credit from Supplier	0%	67%	71%
Other Metals	Self-Finance	67%	67%	80%
	Debt Finance	17%	0%	0%
	Credit from Supplier	50%	67%	40%
Scrap Metal	Self-Finance	67%	100%	86%
	Debt Finance	67%	0%	29%
	Credit from Supplier	100%	50%	57%
Machine for Production	Self-Finance	100%	0%	100%
	Debt Finance	0%	0%	40%
	Credit from Supplier	0%	100%	40%

Table 12: Current funding sources of workshops for raw material & machinery purchase

- The majority of workshops from all three regions rely on self-finance for the purchase of raw materials

- workshops also widely use credit purchase facilities from suppliers for raw material sourcing. However, they do not use bank financing or directly import but instead use local distributors who provide credit sales to the workshops. Debt Financing is used by 67% of the respondents in Bogura for chemical and scrap metal sourcing. However, it is the least used source of finance by workshops for raw material and Machinery Financing overall.

- All of the respondents from Bogura and Jashore have claimed to have used their own money to finance the purchase of machinery for production and these machines have been in use since the inception of their business. 40% of the respondents only from Jashore get access to debt financing and credit from suppliers. All purchases of machinery for production made by the respondents in Cox's Bazar have been financed through credit purchase facilities from suppliers.

II. Eligibility and Requirements to get the Loan

Document/Collateral	Bogura	Cox's Bazar	Jashore
NID	100%	100%	86%
Photo	91%	100%	79%
Trade License	100%	100%	100%
Business Financials	55%	60%	57%
Land/Buildings	73%	60%	86%
Letter of Stock Hypothecation	0%	0%	7%
Demand Promissory Note	0%	20%	0%
Personal Guarantee	73%	40%	64%
Corporate guarantee	18%	0%	7%
Post-dated cheque	45%	20%	21%
Others (Fire & Environment Certificate, Insurance)	18%	20%	21%

Table 13: Eligibility and requirements of workshops to avail loan

- Photo, Trade license and NID of the loan seeker are essential documents for availing Bank/NBFI loans across all regions

- Over 50% respondents across all regions have required their Business Financials to apply for loans

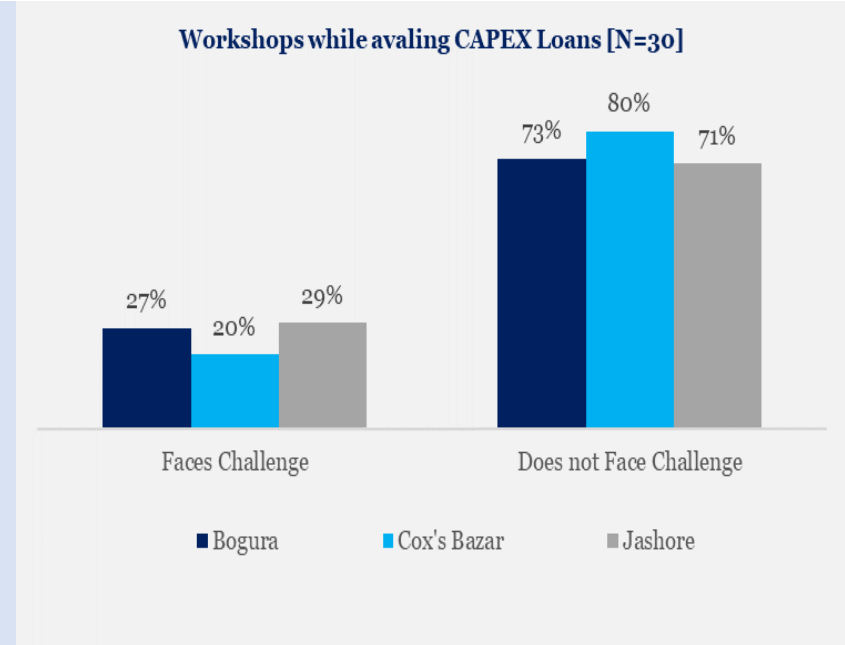
- Collaterals in the form of Land or Buildings were required in case of 86% of the respondents from Bogura
- Around 20% respondents from each region have said that Banks/NBFIs asked for Fire license & Environmental Clearance Certificate and Insurance during the process of approving loans

Actionable Insights:

- Penetration of Debt Financing for production machinery financing is lacking. The workshops are still using the old technology and not upgrading their machines. Banks/NBFIs can explore options to finance advanced production machines that might be required if this sector is to supply spare parts or components efficiently, at low cost in high volume and high quality.
- Insights from the field tell us that many of the required documents to apply for a loan are not maintained by workshops beforehand as they were not aware of such obligations. This elongates the process of application and also acts as a barrier. If the workshops in the sector were brought in under an active regulatory framework that ensures maintenance and renewal of these documents and certifications, they would have easier access to the loans.

Current Pain Points

I. Barriers workshops face to avail CAPEX Loans



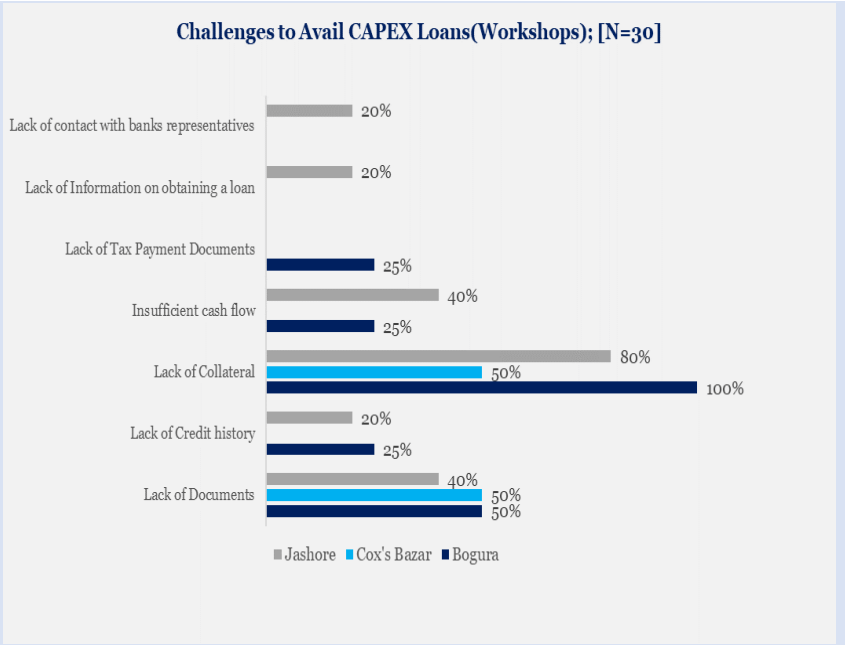


Figure 14 (a & b): Challenges faced by workshops to avail CAPEX loans

- Over 20% of workshops interviewed from all the regions face difficulties in availing CAPEX Loans but over 70% do not face any problems. The most common challenge the respondents identified was the lack of collateral on the workshop's end where 50%-70% of those interviewed claimed that valuation of land was needed to secure loans. In many instances it has been seen that the shops they operate in are often under the name of their father or are rented premises, and therefore these cannot be used as collateral. Further, lack of documents, particularly absence of financial record keeping, as well as yearly renewal of environmental clearance certificates was reported as a major barrier. In Jashore, 20% of workshops interviewed said that they lacked knowledge of how to obtain a loan and don't have contacts with Bank representatives.

II. Record of Past Loan Applications

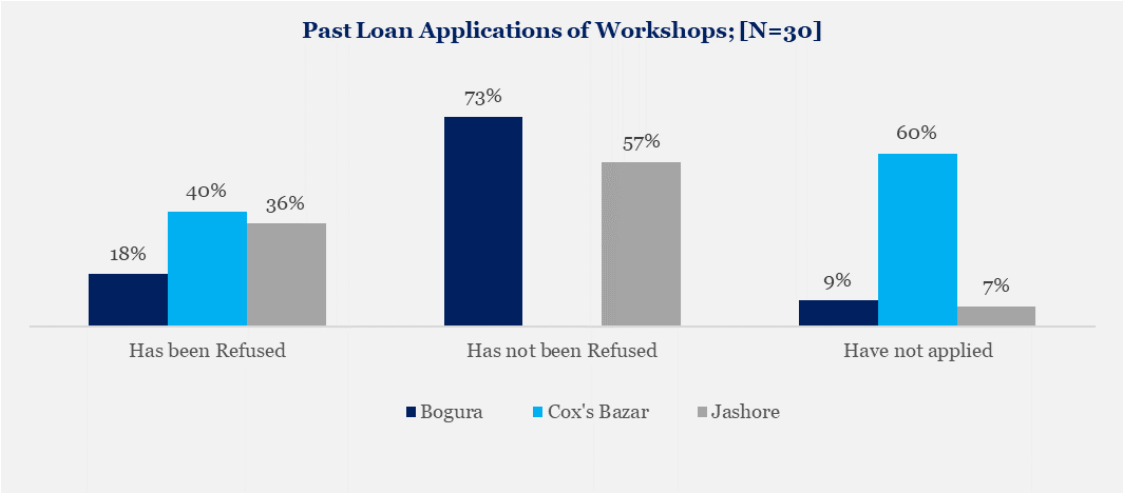


Figure 15: Loan rejection rate of workshops

- In Bogura, 73% of those workshops interviewed claimed that they had not been refused loans. This may be because the workshops in Bogura are more established than in Jashore and Cox's Bazar. In Cox's Bazar 60% of respondents claimed that they have not applied for a loan.

III. Effect of COVID-19

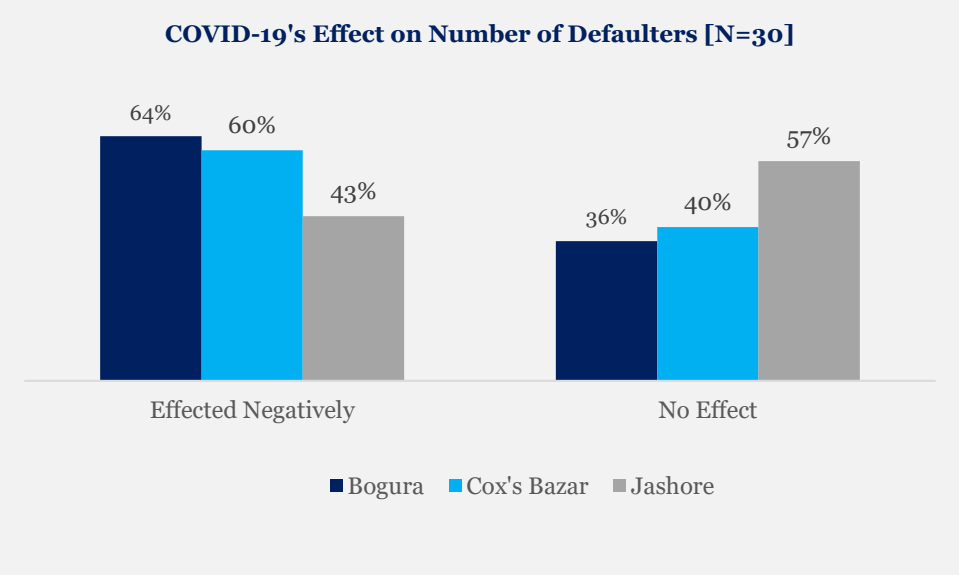


Figure 16: Effect of COVID-19 on workshops

- Majority of the respondents in Jashore (57%) reported that the COVID-19 epidemic had not had an impact on their businesses in terms of the number of customers who failed to repay loans. Respondents from Bogura(64%) and Cox's Bazar(60%) claimed that Covid had increased the number of defaulters.

Actionable Insights:

- The refusal rates for loan application can be brought down by increasing awareness and knowledge among workshops regarding the loan application procedure. Alternative models other than collaterals for risk mitigation are therefore incorporated in the recommendations to give more workshops access to finance.

- Financial training and skill development of workers, along with better access to machinery financing for the owners may widen their product portfolio and help them reach additional consumers from different levels of the value chain.

3.3. Findings and Insights from Respondents (Foundries)

Foundry businesses are not found in Cox's Bazar. The businesses interviewed were therefore all in Jashore and Bogura.

General Business Profile

I. Role in the Value Chain & Customer Base

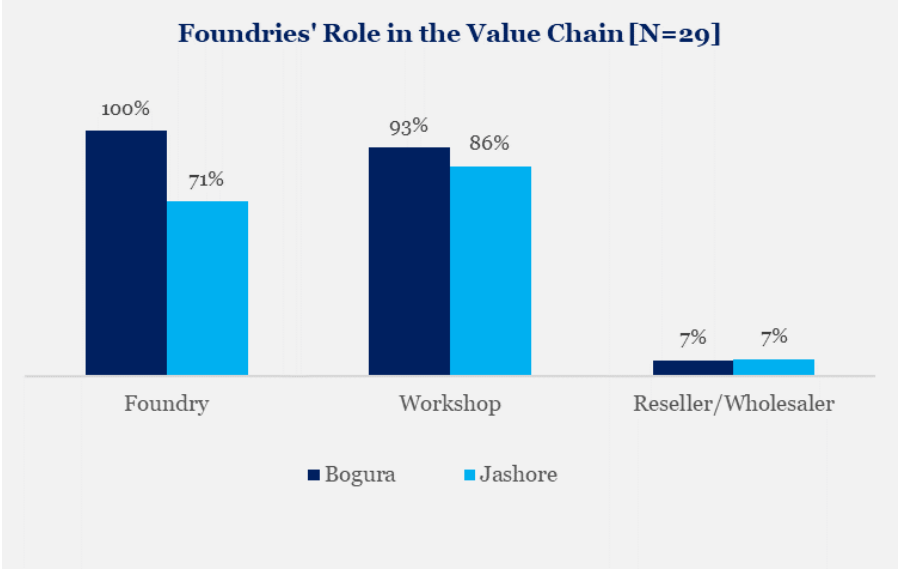


Figure 17: Foundries' role in value chain

- All of the foundries interviewed in Bogura work to melt and cast metal and 93.3% of them have their own metal working businesses. Respondents from Jashore have more metalworking-based businesses than Foundry based businesses. The interviewed businesses claimed also that worker retention is a problem; workers often switch professions or start their own small workshop. Lack of skilled engineers is also an issue if they want to establish a foundry. A small number of respondents (6.7% & 7.1%) in Bogura and Jashore act as Reseller/Wholesaler as well. Some are considering diversification to other types of machinery.

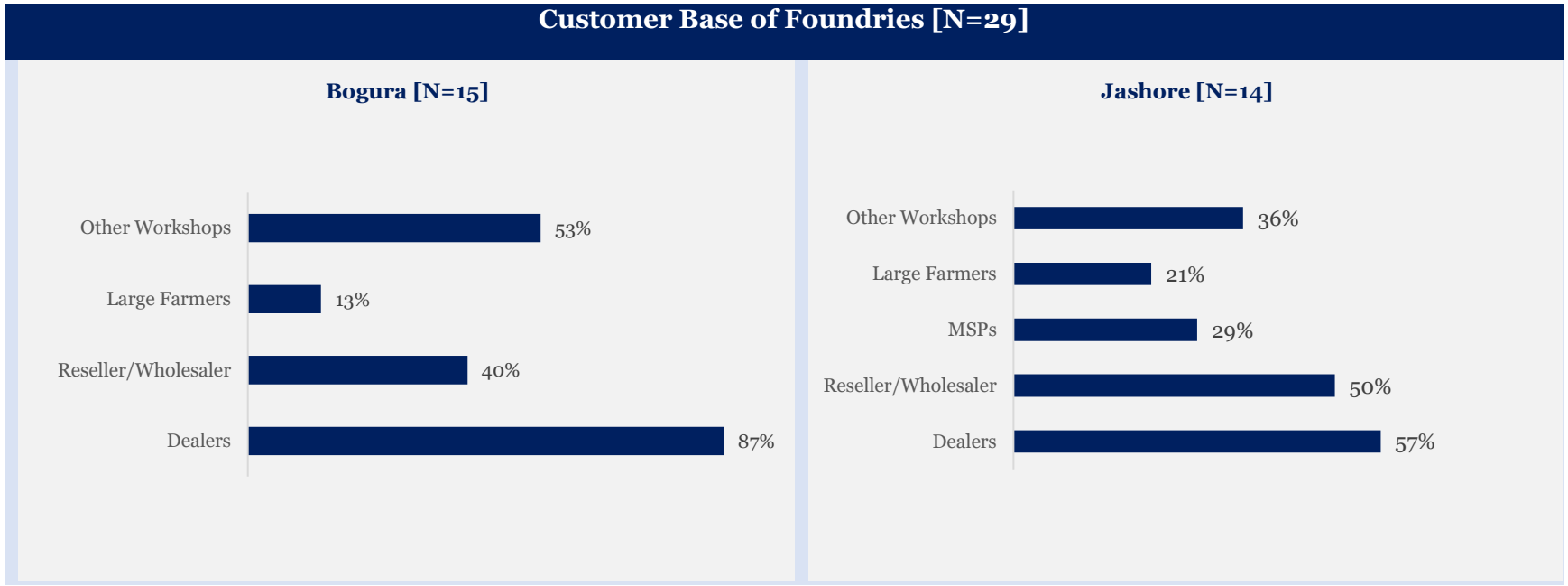


Figure 18: Customer base of foundries

- There appears to be a strong link between foundries and Dealers, particularly in Bogura, as 87% of respondents said they sell through them. The dealer channel is popular since they sell on a contract basis. Some foundries sell products with a guarantee (on average, 2% are returned). Most of the customer base of foundries have other businesses in the machinery value chain. foundrys from Bogura claimed to have no sales to MSPs and only 13% sold to Large Farmers. foundries from Jashore appear to have a wider and more spread-out customer base

II. Seasonality Impact on Sales

Reported High Sales of foundrys by Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bogura	67%	80%	80%	73%	60%	67%	53%	40%	13%	0%	27%	60%
Jashore	64%	71%	79%	71%	71%	64%	36%	29%	29%	36%	43%	50%

Low Sales | Medium Sales | High Sales

Table 14: Seasonality impact on sales of foundries

- Foundries in both the regions have high sales during the months of December to June. A decline in sales is observed starting from July and lasting upto November. However, they have to continue production since they must build up their stocks ready for the next season

III. Product Portfolio & Sales

Bogura		
Name of Machine	Manufactures Whole Machine	Manufactures Parts of Machine
Combine Harvester	0%	7%
Irrigation Pump	20%	27%
Mini Power Tiller	0%	40%
Power tiller operated seeder	7%	7%
Weeder	7%	7%
Thresher	7%	7%
Fodder/ Chopper	7%	7%
Maize Sheller	7%	7%

Jashore		
Name of Machine	Manufactures Whole Machine	Manufactures Parts of Machine
Irrigation Pump	7%	21%
Mini Power Tiller	14%	21%
Four Wheel Tractor	0%	7%
Rice Transplanter	14%	0%
Sprayer	7%	0%
Thresher	14%	0%
Fodder/ Chopper	21%	7%
Maize Sheller	14%	0%
Centrifugal Pump	7%	7%

Centrifugal Pump	7%	7%

Table 15: Product portfolio of foundries

- Among machinery that foundries manufacture fully, the most popular is Tube-Well. Although they claim that its demand is falling fast due to changing demographics and influence of urbanisation. 7% respondents from Bogura claimed to produce Irrigation pump, Weeder, Thresher, Maize Sheller, Fodder/ Choppers to completion. In comparison to Bogura, a higher percentage of respondents from Jashore manufactures Rice Transplanter, Threshers and Maize Shellers.

Average Annual Sales (in '000 BDT) of Foundries interviewed in Bogura			
Name of Machine	**Units Sold**	**Average Price**	**Total Revenue**
Engine driven mobile multi-crop Thresher	150	140,000	21,000
Centrifugal Pump	15,000	2,100	31,500
Seeder	80	65,000	5,200

Table 16: Average annual sales of foundries in Bogura

Average Annual Sales (in '000 BDT) of Foundries in Jashore			
Name of Machine	**Units Sold**	**Average Price**	**Total Revenue**
Centrifugal Pump	2,500	3,500	8,750
Maize sheller	120	60,000	7,200
Rice Transplanter	26	68,000	1,768
Mini Power Tiller	35	32,000	1,120
Wheat milling machine	200	12,500	2,500
Trolley	20	80,000	1,600
Thresher	88	40,000	3,520

Sprayer	150	25,000	3,750
Fodder Chopper	250	23,650	5,913

Table 17: Average annual sales of foundries in Jashore

- Engine driven mobile multi-crop Threshers are manufactured by foundries in Bogura and act as a major source of revenue. The highest revenue for both Jashore and Bogura come from the sales of centrifugal pumps. Other sources of revenue include sales of tube wells and parts of machinery. Some of these foundries have reported that they are in the testing phase with large importers to make new components for machines.

Actionable Insights:

- Foundries generate average low sales value during a particular time of the year. To facilitate repayment for the foundries, financial products should be designed that accommodate this seasonal business, e.g., unequal instalments and ballooning payment schemes.

Financing needs

I. Sales terms and Credit Sales Mechanism

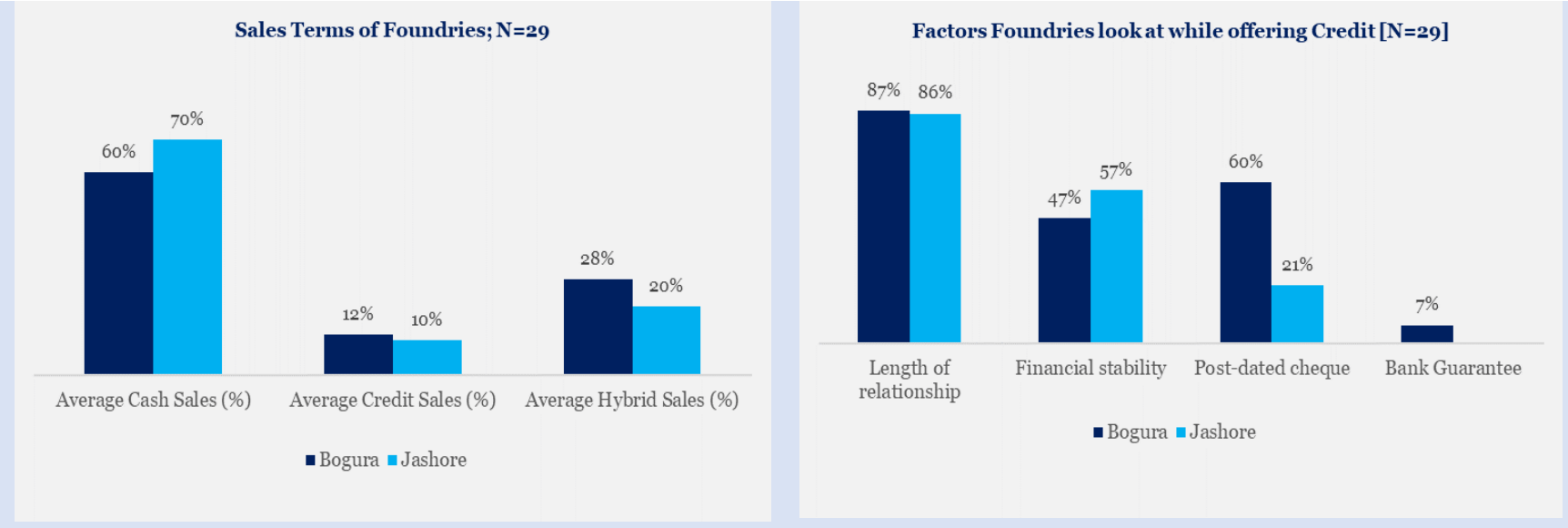


Figure 19 (a & b): Sales terms and factors look at while offering credit by foundries

- Over 60% of sales in both regions are made by foundries through Cash. A hybrid model where a portion of the payment is taken upfront and the rest is paid in instalments is also provided by some businesses. As such, credit sales are the least popular sales term in both Bogura and Jashore

- Length of relationship with customers and their perceived financial stability are the two most commonly used metrics by foundries in determining credit-worthiness of the customer.

- In Bogura 60% of foundries interviewed said they also keep a post-dated cheque while offering products on credit. It appears that foundries from Bogura rely on more formal means of risk mitigation than those of Jashore. Additional insights from the field visits by the LCP team report that 9 out of 9 foundrie owners said that raw Material prices have gone up to double in the past 4-5 years. Prices also increase within the time frame of order placement and delivery date, which reduces margin.

II. Future Plans of Business Expansion & Financing

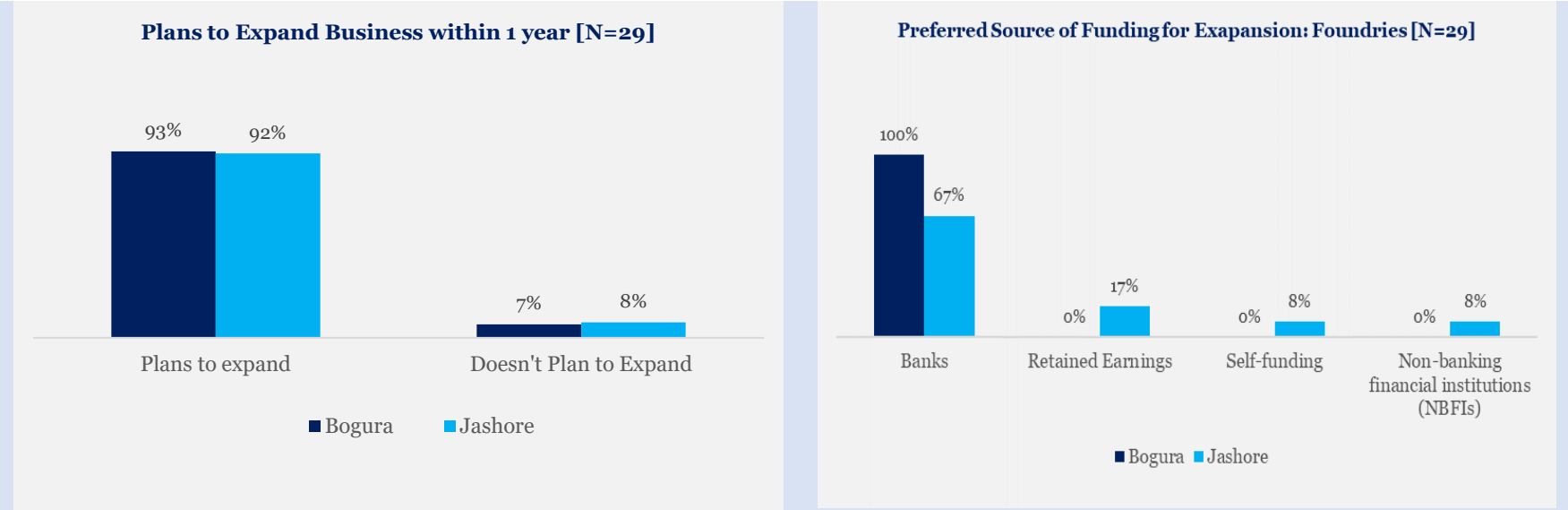


Figure 20 (a & b): Future plans of business expansion and source of finance of foundries

- Almost all the foundries from Bogura (93%) and Jashore (92%) plan to expand their business within 1 year. For financing the expansion, all the foundries from Bogura and 67% from Jashore prefer Banks. Foundries revealed that they keep switching banks in search of higher financing limits and also due to changing relationships with bank managers.

Actionable Insights:

- Credit Sales in both regions (Jashore and Bogura) are low and based on length of relationship. foundries' plans to expand are contingent on funding, especially from Banks. Improving their access to Bank loans might lead to the expansion of the industry as a whole.

Current Financing Status

I. Current Funding Sources for Raw Materials & Machinery Purchase

Material	Source of Finance	Bogura	Jashore
Chemical	Self-Finance	47%	43%
	Debt Finance	67%	36%
	Credit from Supplier	33%	14%
Steel	Self-Finance	53%	43%
	Debt Finance	47%	29%
	Credit from Supplier	13%	7%
Other Metals from Metal Suppliers	Self-Finance	73%	57%
	Debt Finance	53%	29%
	Credit from Supplier	27%	36%
Scrap Metal excluding steel	Self-Finance	73%	57%
	Debt Finance	67%	36%
	Credit from Supplier	27%	21%
Machine for Production	Self-Finance	67%	71%
	Debt Finance	73%	43%
	Credit from Supplier	7%	0%

Table 18: Current funding sources of foundries for raw material & machinery purchase

- Foundries largely use self-financing for their raw materials and machinery purchase. The availability of debt financing for financing these purchases is larger than that of credit from suppliers. This is a major point of difference from the financing options available to SMEs. 73% of the respondents from Bogura claimed to have used debt financing for their machinery purchase. Foundries in Jashore on the other hand are less reliant (43%) on debt financing. Unavailability of credit from suppliers means they need to self-finance their machinery purchase. Foundries in Jashore have a larger appetite for finance than those of Bogura. (e.g BDT 10 lacs and BDT 2 Crores respectively)

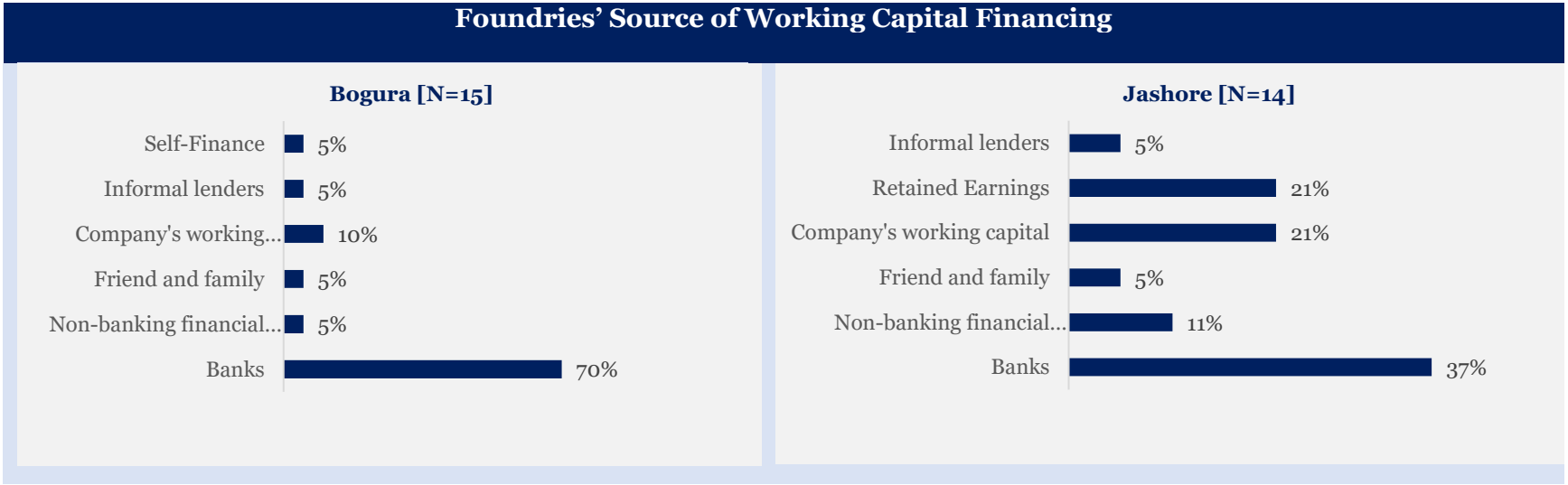


Figure 21: Source of working capital finance of foundries

- In Bogura, banks are widely used by (70%) respondents to finance their working capital. NBFIs, Friends & Family, Informal Lenders are less popular choices in both the regions. Although some have reported that even at a high interest rate they have taken loans from informal lenders. In Jashore however, only 37% of respondents said to have taken bank loans for their working capital financing. There is greater penetration of banks in Bogura than that in Jashore which can be explained by the larger size of loans sought by businesses in Bogura over Jashore.

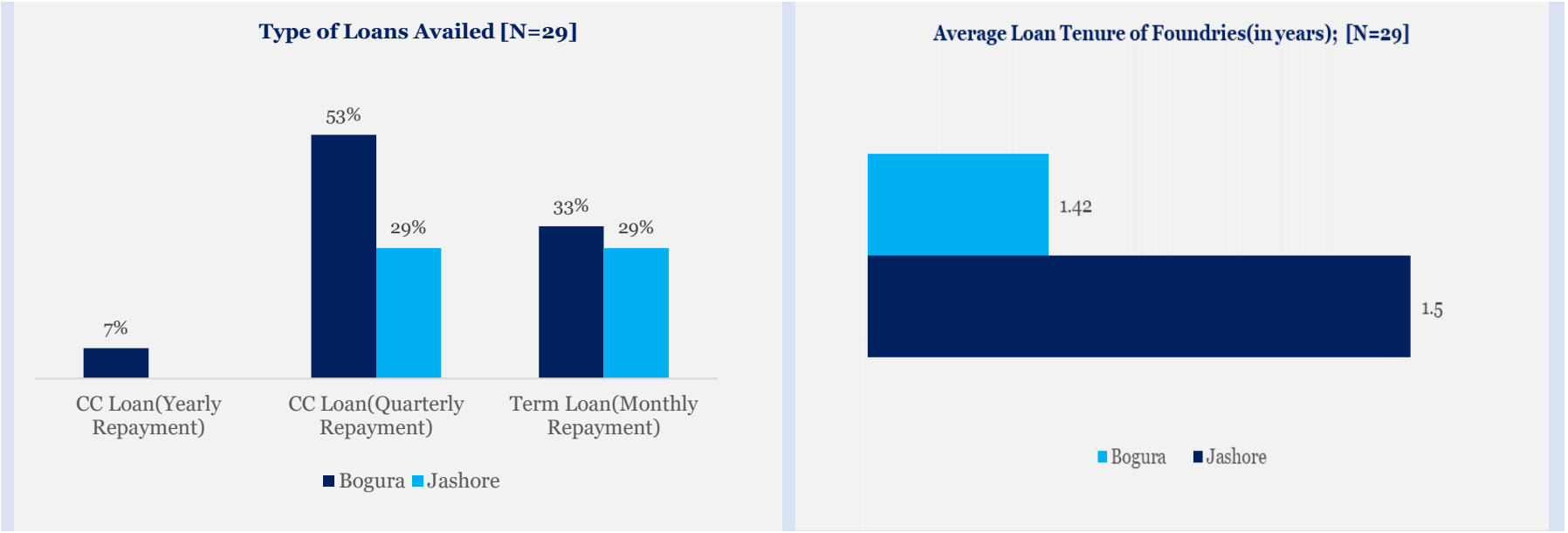


Figure 22 (a & b) : Type of loan taken by foundries and their average loan tenure

- Figure 22 (a) shows that majority (53%) of the loans availed by foundries in Bogura are Cash-Credit Loans with quarterly repayment policies as opposed to workshops who had more long-term loans than CC loans. CC loans that have to be repaid in full at the end of the year were taken by 7% of those businesses interviewed. In some cases, interest rates were calculated on the full amount and not on the repaid amount. Options for renewal of the loan are available upon repayment. The average interest rate of CC loans in both regions was 9% per annum. Some foundries believe that the Government imposed interest cap has instigated FIs to become more stringent in approving loans. Average loan tenure in both the regions is around 1.5 years which is lower than that of SMEs (2.5 to 3 years) in figure 22 (b) .

II. Eligibility, requirements and factors Banks look at to approve loans

Documents and Collateral foundries need to avail Loan		
Documents/Collateral	**Bogura**	**Jashore**
NID	100%	86%
Photo	100%	71%
Trade licence	100%	93%
Business financials	100%	57%
Land/Buildings	87%	71%
Letter of stock hypothecation	13%	7%
Demand Promissory note	0%	0%
Personal guarantee	73%	64%
Corporate guarantee	7%	21%
Post-dated cheque	53%	14%
Fire licence	47%	21%
Environment Certificate	47%	7%
Insurance, Fire & Environment Certificate	20%	7%
Utility bill	0%	7%

Table 19: Eligibility and requirements of foundries to avail loan

- Foundries interviewed in both Jashore and Bogura stated that NID, Photo, and Trade Licences are the most common items required when applying for a loan.
- Although all of the respondents from Bogura said that they needed their Business Financials, only 57% of respondents from Jashore appear to require such documents. Moreover, 87% respondents from Bogura and 71% respondents from Jashore said that they are asked to put up Land/Buildings as Collaterals with 50 to 70% of the value of the asset disbursed as loan. Other documents widely required are Personal Guarantee by an approved guarantor, post-dated cheque, insurance, fire licence & environmental clearance certificate which are essential to renew the CC loans.

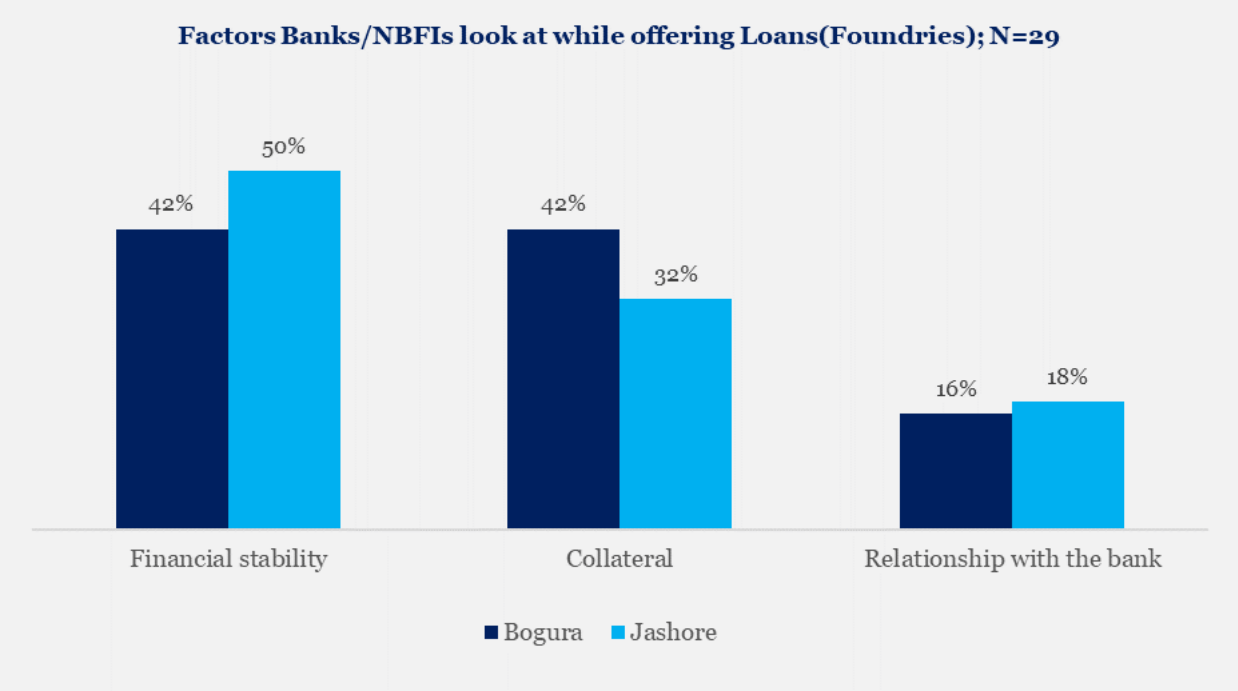


Figure 23: Factors financial institutions look at while offering credit to foundries

- Two most important factors Banks/NBFIs look at while giving out loans across both regions are Financial Stability of the foundry and their ability to put up collateral. In Bogura 42% of those foundries interviewed and 32% in Jashore said that banks require collateral for a loan. Respondents have also said that having a positive pre-existing relationship with the bank makes it easier to obtain loans.

Actionable Insights:

- Primary criteria for offering credit by foundries is Length of Relationship with customer. If the foundries in the sector were brought in under an active regulatory framework that ensures maintenance and renewal of their financial documents and certifications, credit assessment would be more accurate, bringing down default rates and expenses.
- Credit would also be extended to an increased number of good borrowers. Since banks primarily look at Financial Stability while offering loans, possession of up to date and audited documents would make obtaining loans easier.

Current Pain Points

I. COVID-19's effect on loan recovery

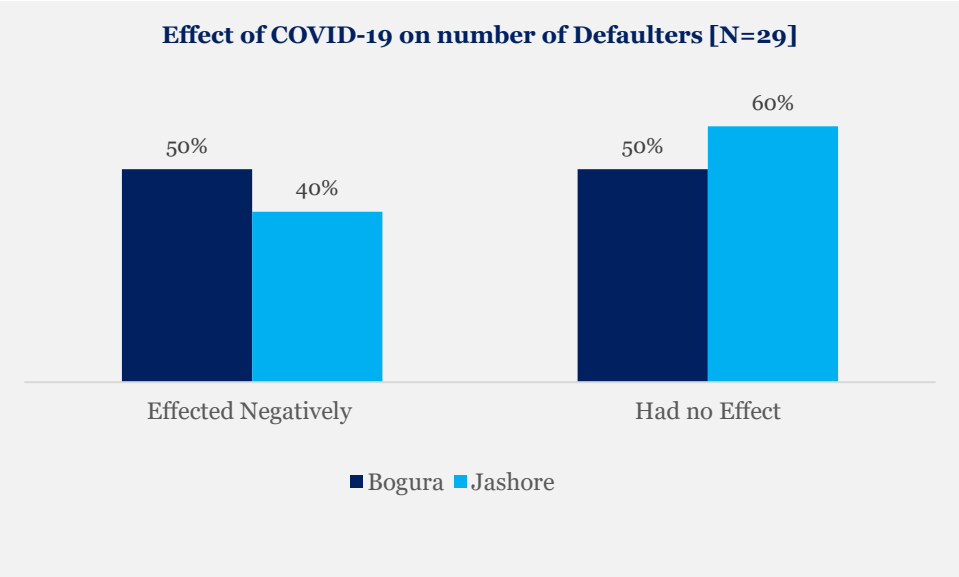


Figure 24: Effect of COVID-19 on foundries

- Respondents in Bogura were evenly split in COVID-19 affecting default rates. Majority (60%) of respondents in Jashore claimed that COVID-19 has had no effect on their credit recovery.

II. Record of Past Loan Applications

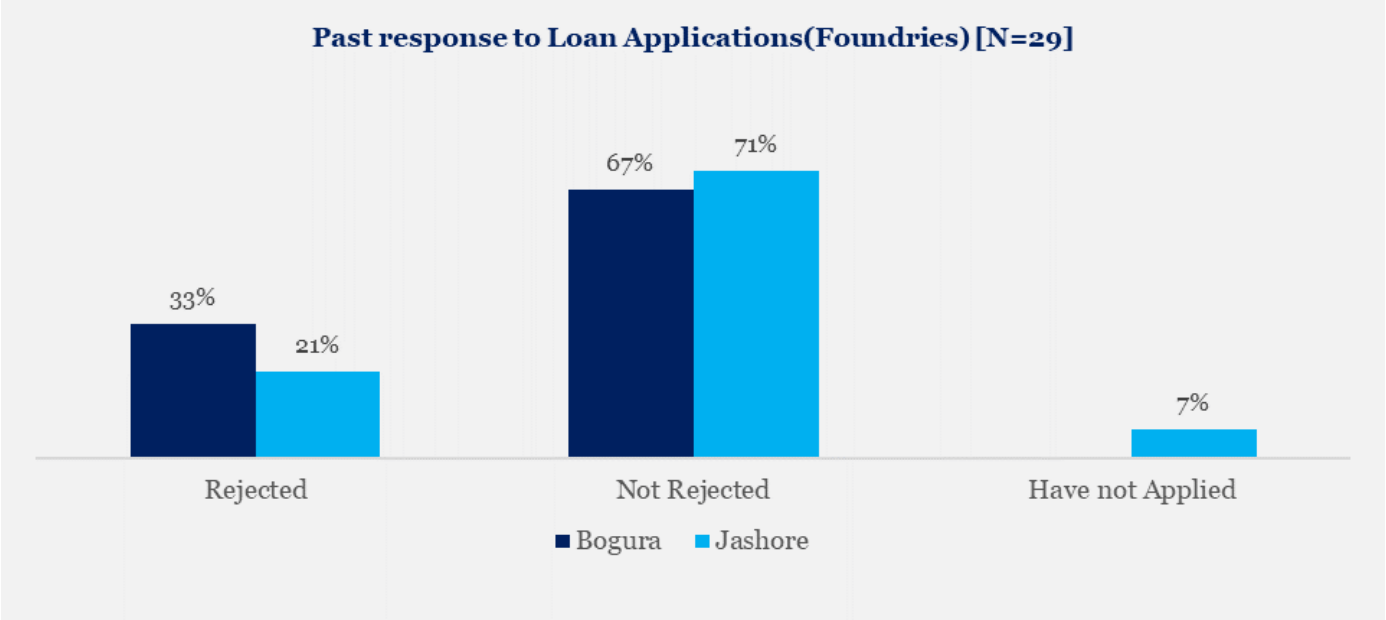


Figure 25: Loan rejection rates of foundries

- In both Bogura and Jashore, a majority of 67% and 71% respectively has not encountered loan rejections
- The % of rejection in Bogura is higher than that of Jashore, which can be explained by the fact that all the respondents in Bogura had applied for loan, whereas 7% of foundries interviewed in Jashore who have not applied.

III. Purchase of Machinery on Credit

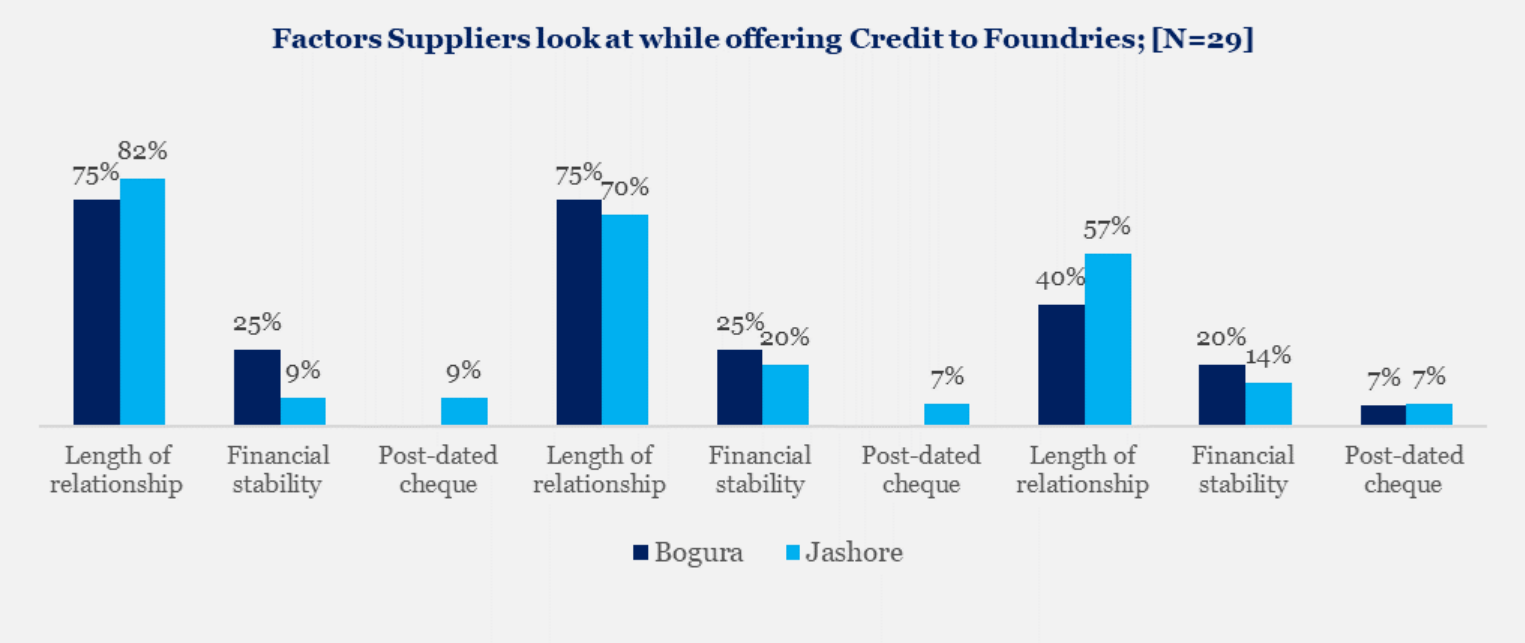


Figure 26: Factors suppliers look at while offering credit

- According to foundries in both Jashore and Bogura, length of relationship is the primary determinant for suppliers to decide whether to offer credit. For new customers, there is no credit extension, unless they have reference from another customer.

- Financial stability of the foundries is also checked. As foundries often do not maintain standardized and audited records of business Financials formal ways of checking financial stability might not be used.

IV. Challenges to avail CAPEX Loans

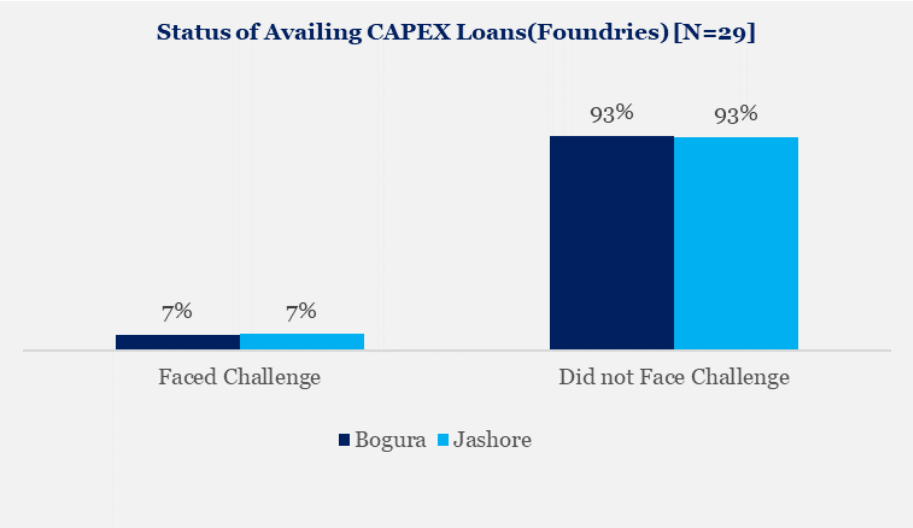


Figure 27: Challenges faced in availing CAPEX loans

- 93% of the respondent foundries from both Bogura and Jashore reported that they have not faced any challenge in obtaining CAPEX loans. The foundries interviewed reported that this was due to the fact that they already have a working capital facility with banks. It was reported that existing banking relationships help them obtain a secondary loan. All of the 7% who faced difficulties identified lack of collateral as their only and primary challenge.

Actionable Insights:

- Length of relationship with the supplier being the primary factor considered while giving out credit means that it is difficult for newer foundries to obtain loans This leaves them with the options of debt financing or self-financing. The requirement for collateral for debt financing is also a major barrier for smaller or newer foundries looking to expand. In this case, there must be some form of collateral for ensuring security against default.

- Maintenance of proper business records on the part of foundries will make it easier for suppliers to assess the enterprise. This might mean that newer foundries with good financial records can get credit from suppliers. It might also make the supplier

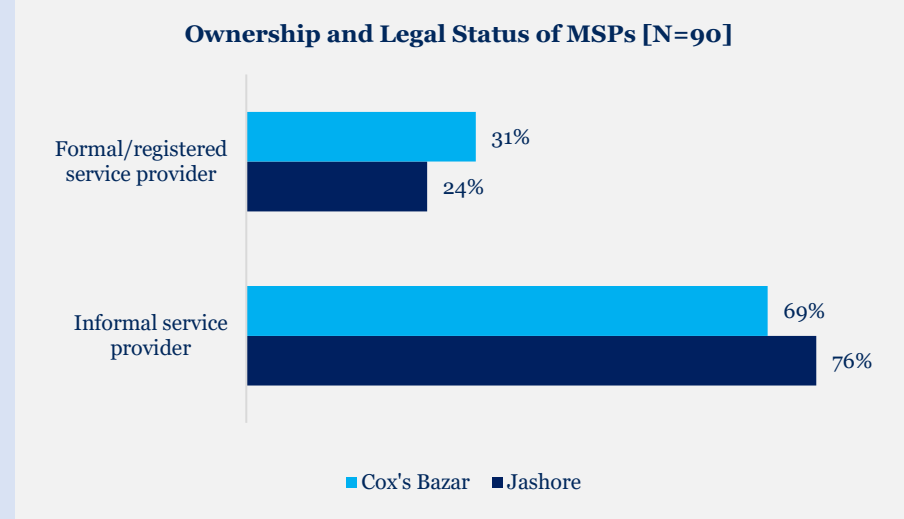
market more competitive by increasing the number of potential suppliers for each foundries, since they would now be able to consider suppliers from out of their existing network.

3.4. Findings and insights from Machinery Service Providers (MSPs)

MSPs were available for interviews in Jashore and Cox's Bazar. The majority of MSPs interviewed were in Jashore (54, 60%) out of a total of 90 interviewed.

General Business Profile

I. Legal Status of Business and their Source of Knowledge in Finance



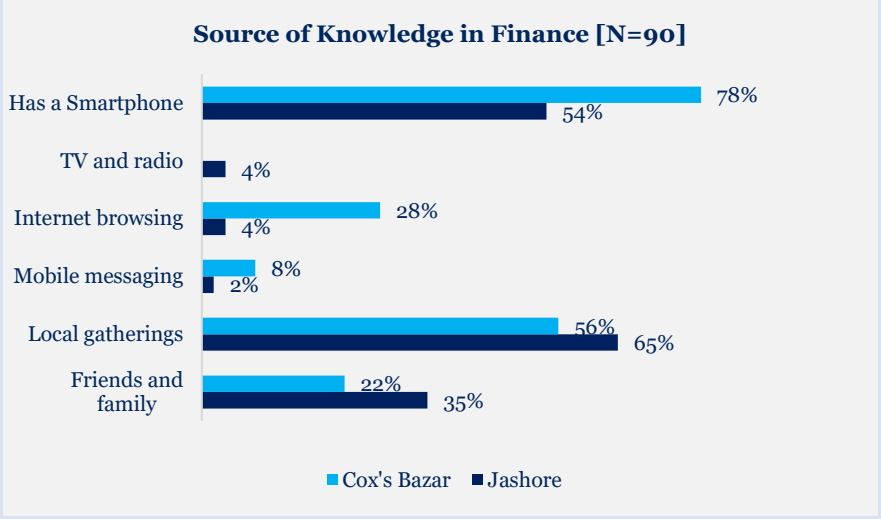


Figure 28 (a & b): Legal status of MSPs and their source of knowledge

- In general, MSPs are mostly informal service providers with 69% out of the 36 respondents from Cox's Bazar and 76% out of the 54 respondents from Jashore stating they are informal service providers. MSPs in both the regions are generally farmers who have additional capacity in terms of mechanized farming and offer services at different phases of cultivation.

- In terms of smartphone ownership, 78% of respondents in Cox's Bazar and 54% in Jashore own a smartphone.

- When it came to gathering financial knowledge from different sources, 65% in Jashore and 56% in Cox's Bazar obtained their information during local gatherings and 35% in Jashore and 22% in Cox's bazar from friends and family.. In Cox's

Bazar 28% of respondents used the internet to obtain financial knowledge but only 4% of MSPs interviewed in Jashore used the internet as a source of financial information.

- Since they have access to smartphones and also use it as a source of information, any digitization of financial services will be relevant for this group. Similarly, any financial products can be promoted through notification via phones and through local gatherings too. Local gatherings is a channel that MFIs use to target this group and continue to do so. This may not be suitable for banks but they can opt for SMS services.

II. Type of Machine and their Source of Procurement

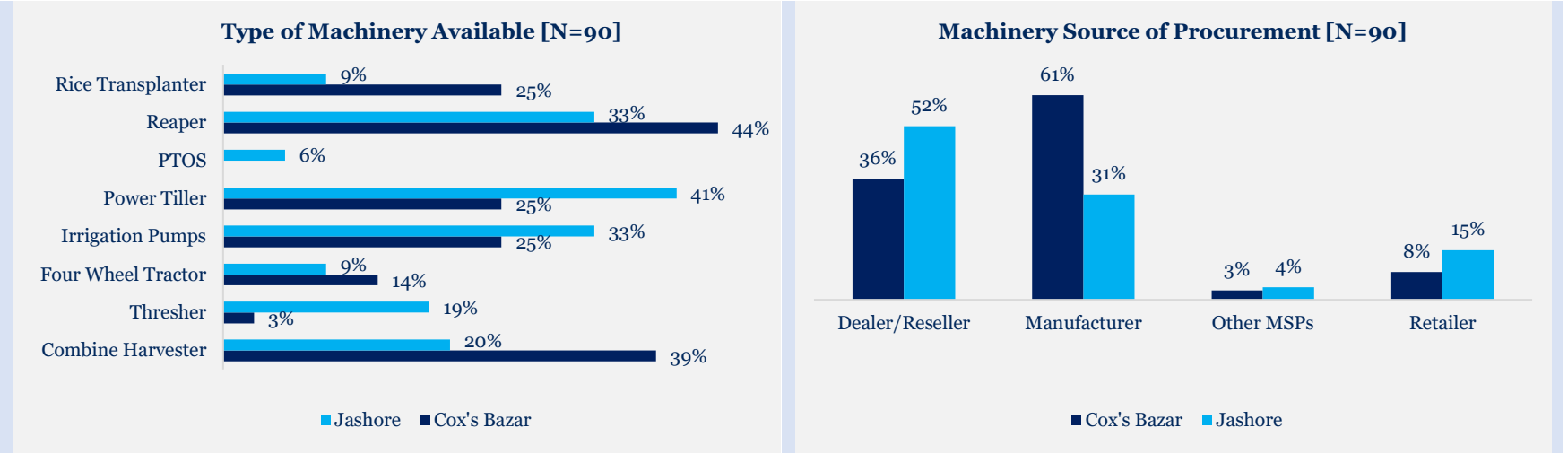


Figure 29 (a & b): Type of machinery available and their source of procurement

- While the portion of Power Tiller and Thresher used by MSPs in Jashore were higher than in Cox's Bazar the percentage of Combine Harvester users was only 20% in Jashore compared to 39% in Cox's Bazar. Similarly, around 25% and 44% of the respondents in Cox's Bazar used a Rice Transplanter and Reaper, while only 9% and 33% used these machines in Jashore.

- In terms of Machinery Procurement, MSPs in general acquired machinery mostly from Dealer/Reseller and Manufacturer. In Cox's Bazar, 36% and 61% of the respondents bought machinery from Dealers and Manufacturer, while in Jashore, 52% and 31% took it from Dealers and Manufacturer, respectively.

III. Demand for Different Types of Machinery from End Customer

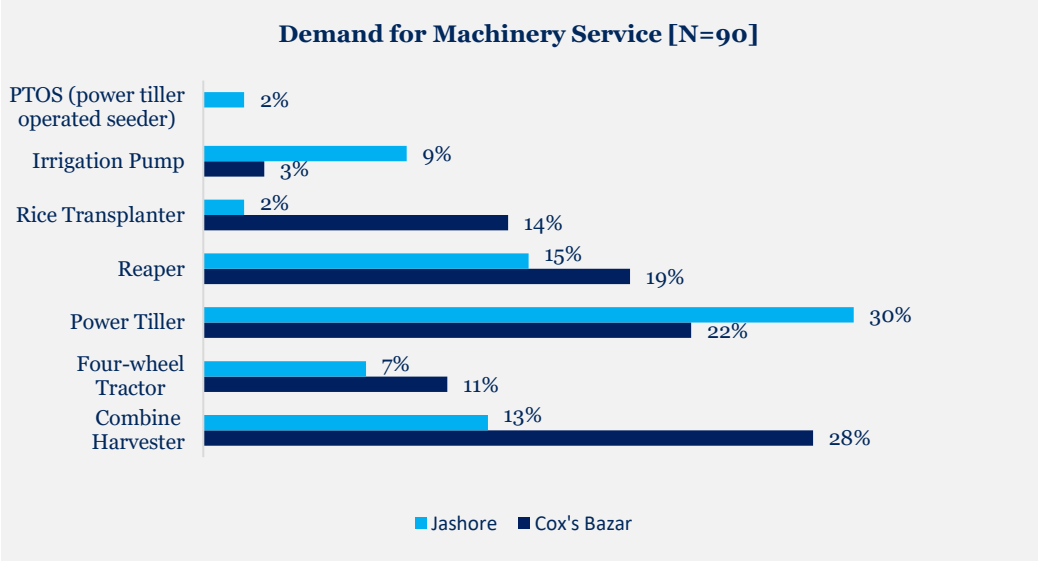


Figure 30: Demand for machinery services

- Demand for machinery like Combine Harvesters, Power Tillers and Reapers are the highest among farmers in both the regions.

- In Cox's Bazar, 28% and 22% of the respondents claimed that demand for Combine Harvesters and Power Tiller is high, respectively. While for the same machinery, 13% and 30% of the respondents from Jashore claimed these respectively to be in demand among other machinery.

- Demand for Power Tillers, Rice Transplanters and Reapers are higher than that of Combine Harvester in Cox's Bazar, as most people are not used to it. They often perceive it to be sophisticated and difficult to maintain even if it offers higher yield. However, MSPs with the capacity to purchase Combine Harvester do not hesitate in getting one as they often outsource the machine to other regions when the demand is low in Cox's Bazar.

- MSPs in Jashore are operating 1-2 machines under their name. Reapers are most commonly available among them. Providing services is difficult in certain locations around Jashore, particularly in "gher" areas, where transporting machines is a big challenge.

IV. Investment made by MSPs in the Last 2 Years and their Average Income Per Year from Service Provision

Average Machinery Specific Investment in the Last 2 Years						
	Cox's Bazar			Jashore		
Machinery Names	Quantity	Price (in '000 BDT)	Value (in '000 BDT)	Quantity	Price (in '000 BDT)	Value (in '000 BDT)
Combine Harvester	1	1,850	1,850	1	1,928	1,928
PTOS	-	-	-	1	110	110
Power Tiller	1	147	147	1	131	131
Reaper	1	80	80	1	93	93
Rice Transplanter	1	230	230	6	70	420
Thresher	-	-	-	1	40	40
Four-Wheeled Tractor	2	904	1,808	2	890	1,780

Table 20: Average investments made by MSPs in the last 2 years

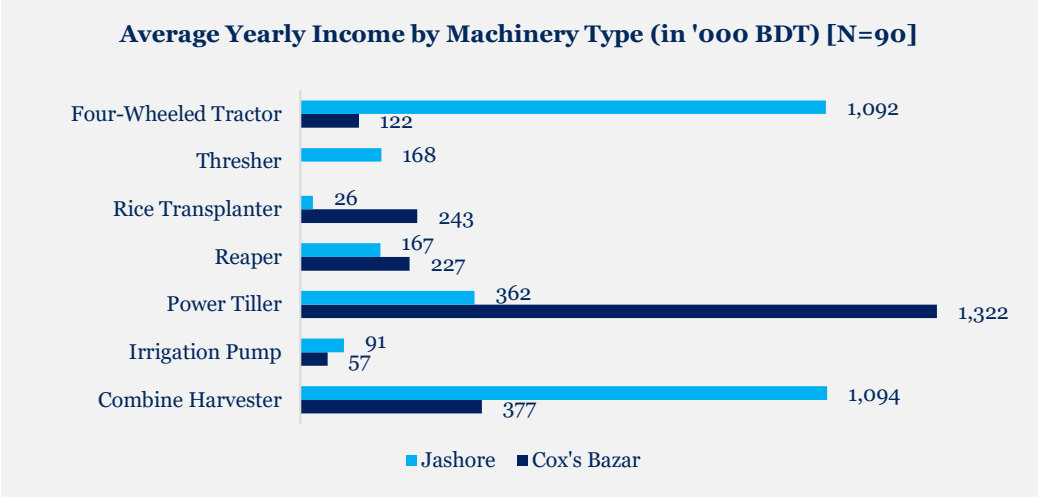


Figure 31: Average yearly income by machine type of MSPs

- They typically charge based on land area operated on. MSPs operate their own machines when providing these services or rent them out to operators. The fee is split equally between the owner and the operator. In addition, operators can be hired under a fixed monthly fee of 20,000-30,000 BDT/ month. In general, MSPs usually takeaway a profit of 50% of the revenue after deducting driver's wages, fuel and maintenance expenses.

- The MSPs acquire customers through word of mouth and peer networking. So there seems to be no formal planning on providing services, which also disrupts their flow of revenue. The revenue earned from providing machine services are based on the type of farming operation and the area of land serviced. For instance, rates of cultivator and reaper machines are 800 BDT/Bigha and 1000/Bigha respectively. Pumps are also rented out hourly at 100 BDT/hour. The rate of the fee also differs based on region and through FGDs it was learnt that that fee rates for machinery services have gone down in some areas. Regions with high demand and low supply of services typically have higher rates. The rate also goes up for areas that are harder to reach with machines. Some MSPs mentioned competition in their areas while others mentioned lack of machines in their respective areas. Many MSPs move to these high demand areas to provide services during the season.

- Average investment made in the last 2 years for both the regions are similar. In the case of big machinery, investment in Combine Harvesters was 1.97 MN BDT and 1.85 MN BDT in Jashore and Cox's Bazar, respectively. For Rice Transplanters, an average of 0.42 MN BDT and 0.27 MN BDT were made in Jashore and Cox's Bazar, respectively. MSPs

want to buy bigger machines like Combine Harvester, Thresher and Rice planters but lack the capital to do so. They face difficulties in terms of machine maintenance due to absence of good mechanics within the area and scarcity of spare parts in cases of the big machines.

- Even though high investments were made in Cox's Bazar on Tractors and Combine Harvesters, yearly income generation has been low at 0.12 MN BDT and 0.37 MN BDT, respectively. In Cox's Bazar, MSPs believe that Combine Harvesters have the capacity to make the most profit, however, they are not well perceived yet in Cox's Bazar. Due to this, the number of drivers who can operate a Combine Harvesters is low.

- While in Jashore, both Tractors and Combine Harvesters yearly income have been around 1 MN BDT. However, in the case of Power Tillers, average yearly income in Cox's Bazar has been 1.32 MN BDT while that in Jashore is 0.36 MN BDT.

Actionable Insights:

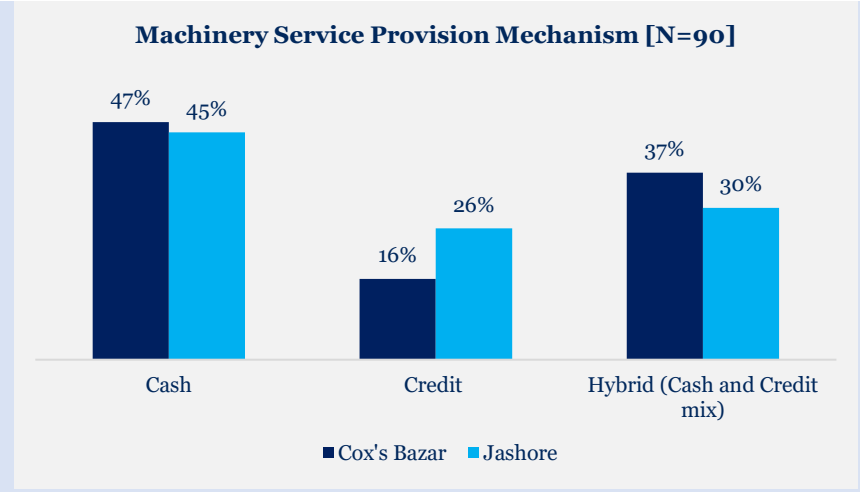
- MSPs are mostly informal service providers, for which they have the need to be formalized for better access to finance from financial institutions.

- Higher demand for machinery does not necessarily reflect on the average income due to geographical differences in the zones and lower adoption rate among farmers. Hence, awareness and technical skills need to be developed for Combine Harvesters in regions like Cox's Bazar. Similarly, there has to be focus on improving spare parts supply in both the regions.

Financing Needs

I. Average income of MSPs per year is around 0.6 MN BDT in Cox's Bazar and 0.9 MN BDT in Jashore with an average cost incurred of approximately 50% of the total revenue.

II. Credit mechanism of MSPs for their customers



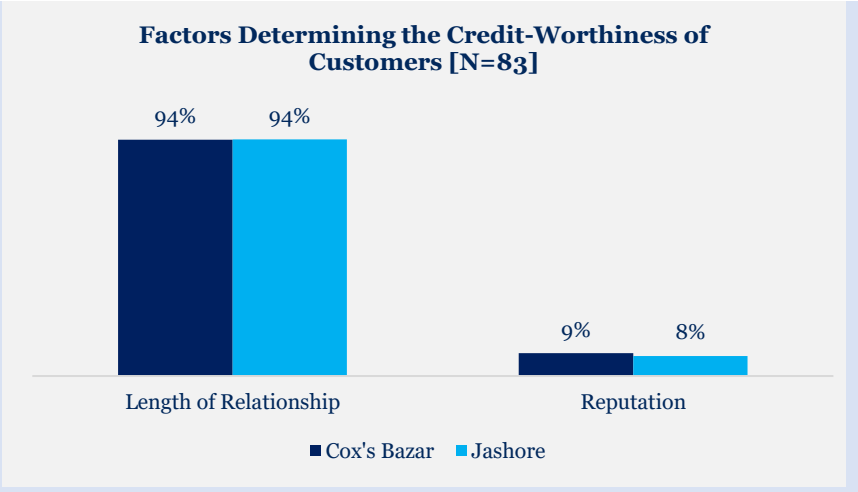


Figure 32 (a & b): Service provision mechanism and factors determining credit worthiness of customers of MSPs

The figures above show the service provision mechanism of all the 90 MSP respondents and the factors that 83 of the respondents who provide credit facilities look at while offering service on credit.

- In general, MSPs provide services mostly on a cash and hybrid basis with some in credit mechanisms. It was seen that 47% and 45% of the respondents in Cox's Bazar and Jashore preferred cash transactions, respectively. On the other hand, 16% and 26% of the respondents offer credit services in Cox's Bazar and Jashore, respectively. In most of the cases in Cox's Bazar, MSPs do not require loans to operate their business as most of the revenue is recovered as soon as the service is provided. There are certain cases where the credit cycle reaches 2-3 months. In Jashore, the revenue collection cycle is short as well. The fees are paid promptly after the service is provided. Some customers take 1-2 months to pay, but MSPs are generally paid within the respective season. However, as the business is season based, the earnings are skewed throughout the year.

- Out of the 83 MSPs that provide services on credit, 94% of the respondents in both the regions determine credit-worthiness based on length of relationship. This corresponds to the way they procure customers because sourcing is done mainly among a close network of people.

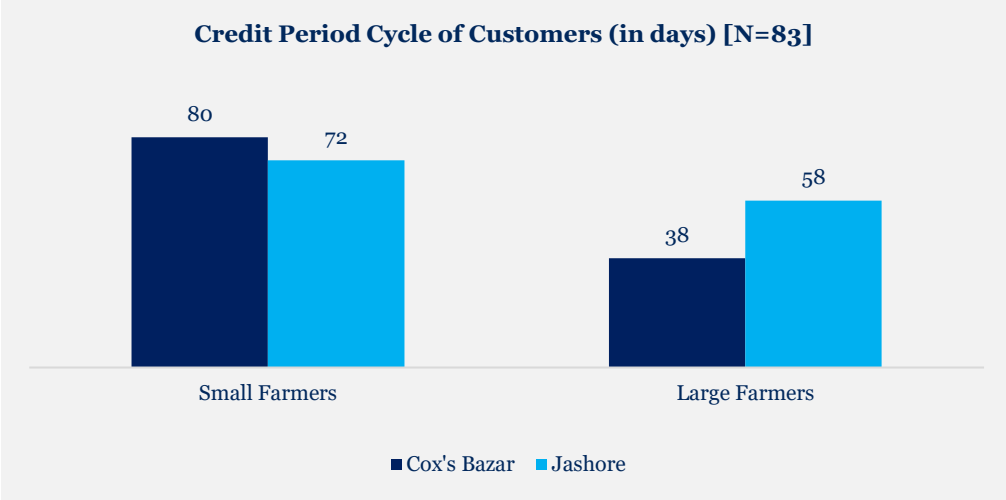


Figure 33: Credit period cycle of customers of MSPs

- Typical credit period days for small farmers is around 80 days and 72 days in Cox's Bazar and Jashore while that of large farmers is 38 days and 58 days, respectively. This shows that large farmers typically are able to payback within the respective season since most MSPs can provide service for a maximum 45 to 50 days per season. In the case of small farmers, the payment period extends longer.

III. Business Aspirations and Source of Fund

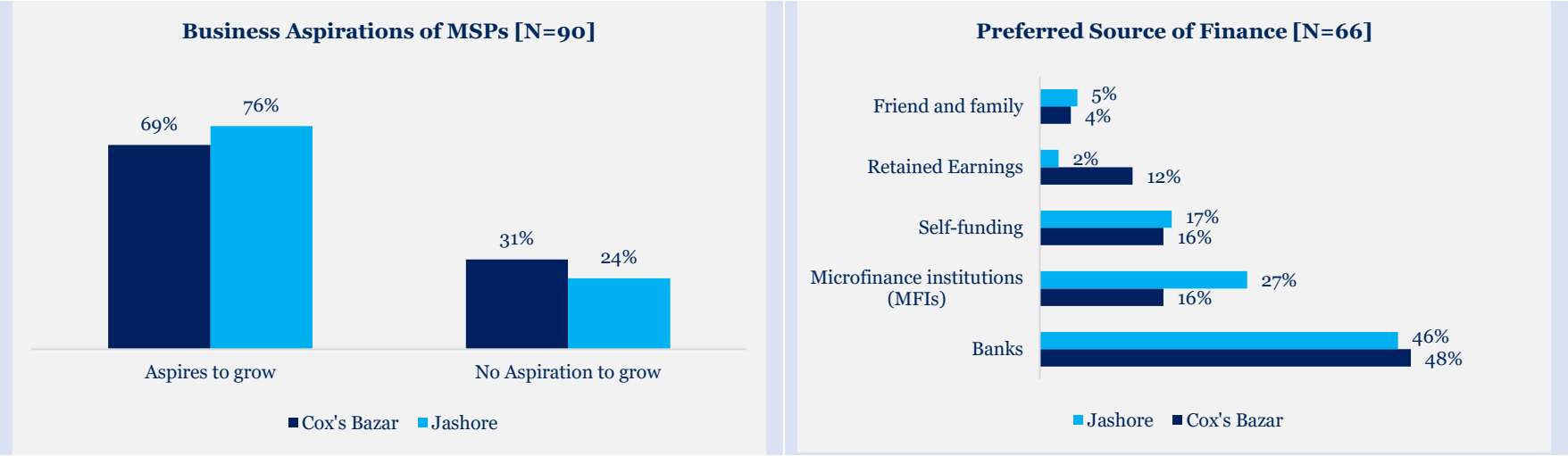


Figure 34 (a & b): Business aspirations and source of fund of MSPs

The figures above show the number of MSP respondents who aspires to grow and the preferred source of finance of the 66 respondents who aspires to grow, respectively.

- Business aspirations of MSPs are high, however, 31% and 24% of the MSPs in Cox's Bazar and Jashore, respectively, do not aspire to grow due to low-income generation and lack of adoption of machinery among farmers. In terms of financing, they are regularly approached by NGOs (MFIs) with loan offerings. However, the interest rates offered by MFIs are less suitable than that of banks. Unfortunately, despite having an interest in bank funding, since moveable assets like machines are not considered as collateral, MSPs often don't qualify for bank loans on account of having too little collateral to offer.

- Among the ones who want to grow their business, an average of 47% of those from Jashore and Cox's Bazar want to source the fund from banks followed by 27% and 16% of the respondents from Jashore and Cox's Bazar wanting to source from MFIs, respectively.

Actionable Insights:

- Since an average of 34% of the business runs on hybrid mechanisms, MSPs do not necessarily have a stable cash flow and this might hamper the repayment schedule set by banks or suppliers.
- There is a high aspiration among MSPs to expand their businesses with banks being their primary intended source of funding. This shows that there is a demand for bank financing among this stakeholder group. However, low adoption rate and poor business performance has led to some not aspiring to grow. Therefore, zonal workshops need to take place for improved awareness about both the machinery and source of finance in order to improve the aspirations of service providers and farmers.

Current Financing Status

I. Type of Finance and Source of Fund used by MSPs

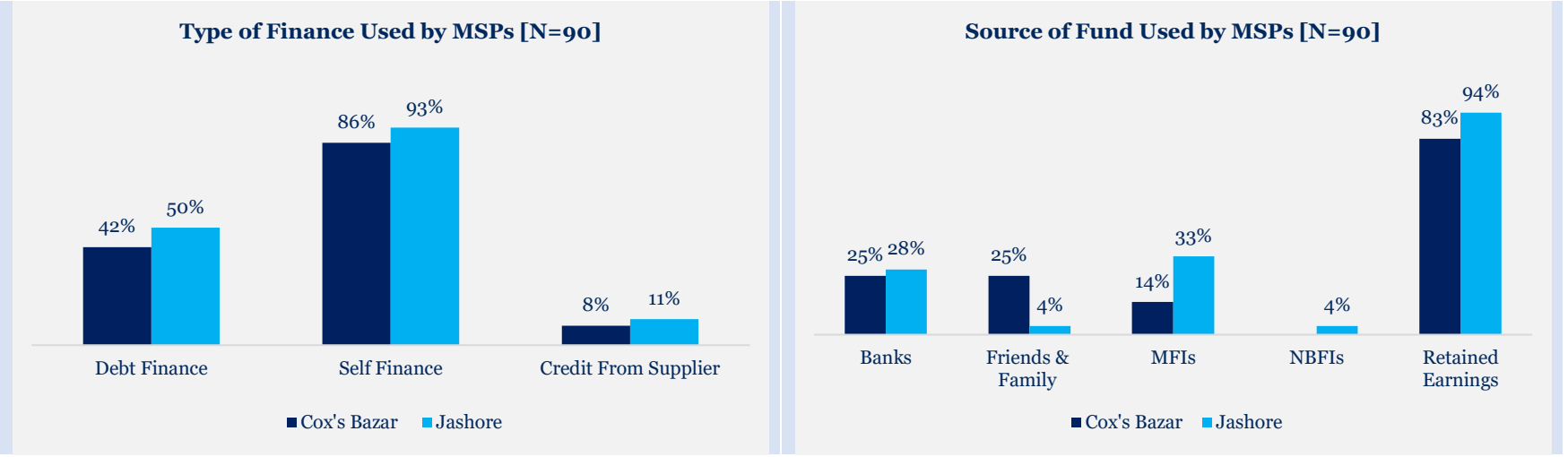


Figure 35 (a & b): Type and source of finance used by MSPs

- Generally, MSPs have to rely on their own finance to purchase machinery with 86% and 93% of the respondents from Cox's Bazar and Jashore claiming it respectively. Debt finance was used by less than 50% of the respondents from both the regions. External sources of finance are not used generally by the MSPs at present, and 83% and 94% of the

respondents from Cox's Bazar and Jashore use their retained earnings as a source of funds respectively. It is followed by Banks and MFIs with respectively 28% and 33% of MSPs interviewed from Jashore and 25% and 14% of MSPs interviewed from Cox's Bazar using these sources of finance. This indicates that they have to rely on their earnings mostly to survive and therefore indicates the need for external financing for sustaining in the long run.

II. Eligibility Requirements for MSPs to get Credit

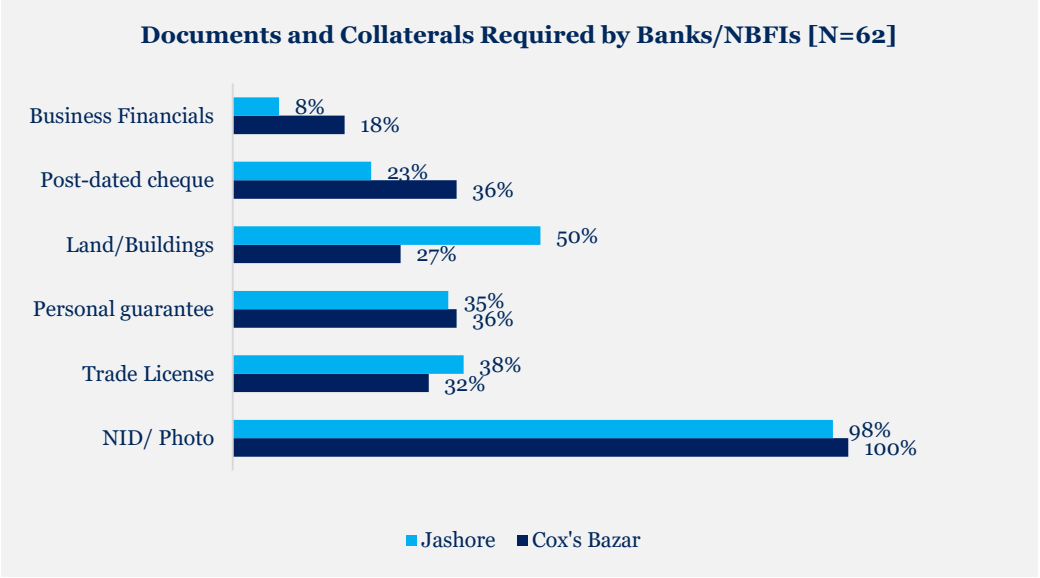


Figure 36: Documents and collaterals required by banks and NBFIs for MSPs

The figure above shows the 62 MSP respondents who are aware of the documents and collateral requirements of banks and NBFIs.

- Among the MSPs interviewed 62 either have access to external finance or are aware of eligibility requirements. These MSP were then able to respond to this question. This refers to the knowledge gap among the remaining MSPs in accessing finance which are highlighted in the following section too.

- Apart from compulsory documents like NID and Photo, a Trade license is required as claimed by 38% and 32% respondents in Jashore and Cox's Bazar, respectively. Similarly, collateral is important as stated by 50% and 27% of the

respondents in Jashore and Cox's Bazar, correspondingly. Along with collateral, personal guarantee is an important criterion as well for securing bank/NBFI finance.

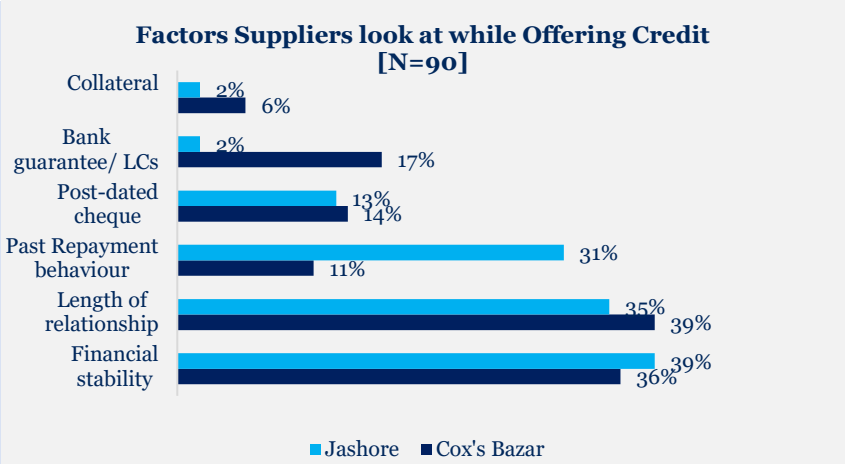
Actionable Insights:

- MSPs are mostly dependent on self-finance and they use their retained earnings to purchase machinery. Therefore, banks should investigate their products in order to make it accessible for MSPs. For the purchase of expensive machines such as combine harvesters and four-wheel tractors this is only viable if the MSP is a wealthy business owner with excess finance. If not, then MSPs can only afford, using their own finance, to purchase lower cost, less remunerative and increasingly redundant lower cost machines such as threshers, reapers and power tillers.

- Collateral and Trade license being an important document often restricts MSPs to meet the requirement of banks. They should formalize their business while banks should offer alternate collateral free financing schemes.

Current Pain Points

I. Factors Suppliers consider when Offering Credit and Barriers to Purchasing Machinery



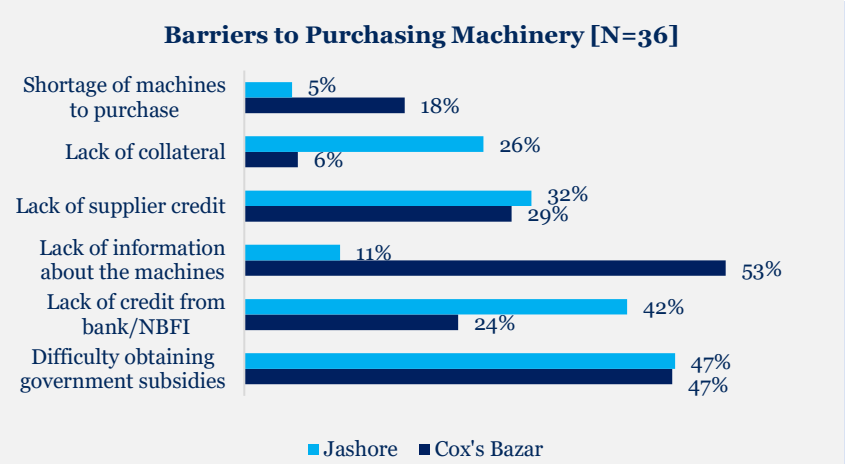


Figure 37 (a & b): Factors suppliers consider at while offering credit and barriers to machinery purchase of MSPs

The figures above show the factors suppliers consider when offering credit and the 36 MSP respondents who have faced barriers in purchasing machinery, respectively.

- In both the regions, suppliers mostly look at financial stability and length of relationship with customers while offering credit, which is mostly the hire purchase schemes run by the importers of machines. In Jashore 39% of those respondents who faced difficulty buying machinery and 36% in Cox's Bazar e claimed that suppliers look at financial stability while 35% and 39% of the respondents from the same zones stated that suppliers look into length of relationship, respectively.

- However, 47% of the respondents from both the regions claimed that they face difficulties in obtaining subsidies. The subsidy process is lengthy and involves a lot of formalities, including spending some out of pocket money for documentation. On the other hand, 42% of the of the respondents from Jashore stated that there is a lack of credit available in the market while 53% of the respondents from Cox's Bazar indicated that they do not possess enough knowledge about the machinery available in the market.

II. Effect of COVID-19 on MSPs

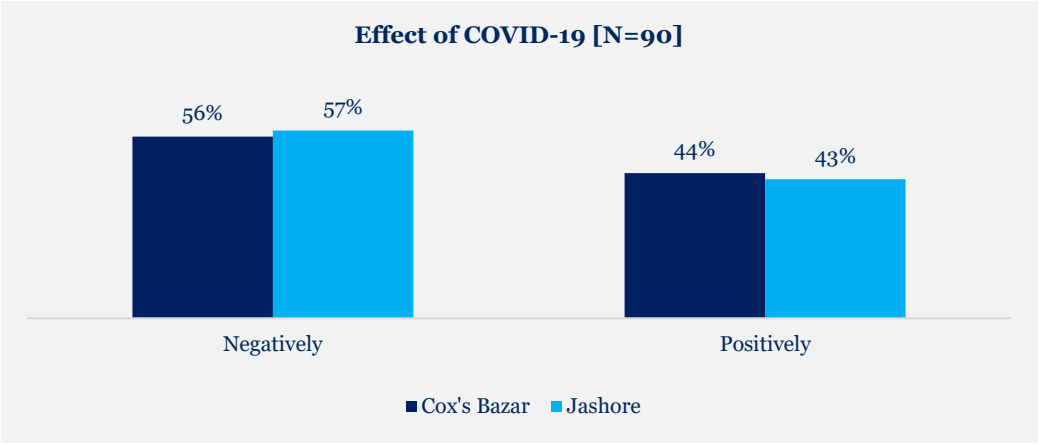


Figure 38: Effect of COVID-19 on MSPs

- Covid-19 has impacted around 44% of the respondents positively from both the regions due to labor shortages and opportunity for farmers to earn more from this scarcity.

III. Loan Rejections Faced by MSPs

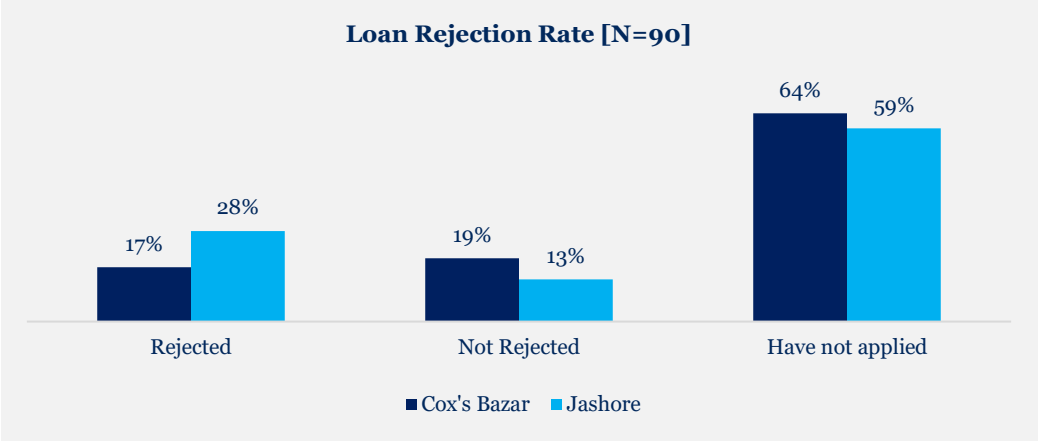


Figure 39: Loan rejection rate of MSPs

- Around 64% and 59% respondents from Cox's Bazar and Jashore have not applied for a loan which echoes the explanations provided earlier that they were relying on retained earnings to finance their business and not going for external financing. This is also because a lot of them know that they do not have collateral to provide banks which are explained in detail in the following section.

IV. Challenges in Acquiring Working Capital Loans and CAPEX Loans

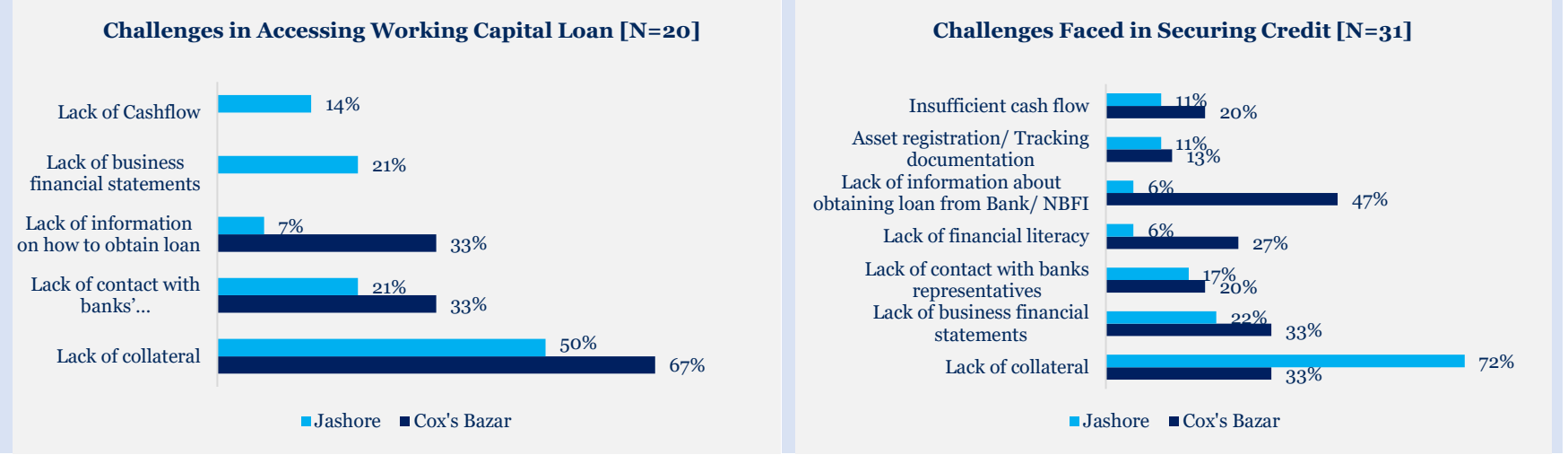


Figure 40 (a & b): Challenges in securing working capital and CAPEX loans of MSPs

The figures above show the 20 MSP respondents who faced challenges in accessing working capital loans and the 31 MSP respondents who faced challenges in securing CAPEX loans, respectively.

- In both cases, lack of collateral has been the primary challenge for securing a loan. Most of these farmers do not own land to offer as collateral and the machines they have cannot be used as a collateral making impossible to obtain bank financing. On the other hand, the challenges were identified only by those who had access to finance or have applied at any point in time. This again highlights that they are quite unaware of bank financing products, since these products are not promoted by banks heavily in those regions, unlike MFIs who approach this group regularly for financing.

Actionable Insights:

- MSPs need to maintain proper financial documentation in which case their financial literacy must be improved to establish their business viability to banks.

- MSPs are approached by MFIs who provide collateral free loans; however, bank financing is a challenge for them due to lack of collateral. There has to be a mechanism to either provide collateral free loans or an alternate recourse for banks/NBFIs to cater to this segment.

3.5. Findings and Insights from Dealers

General Business Profile

I. Type of machinery dealers interviewed sell and the source of procurement

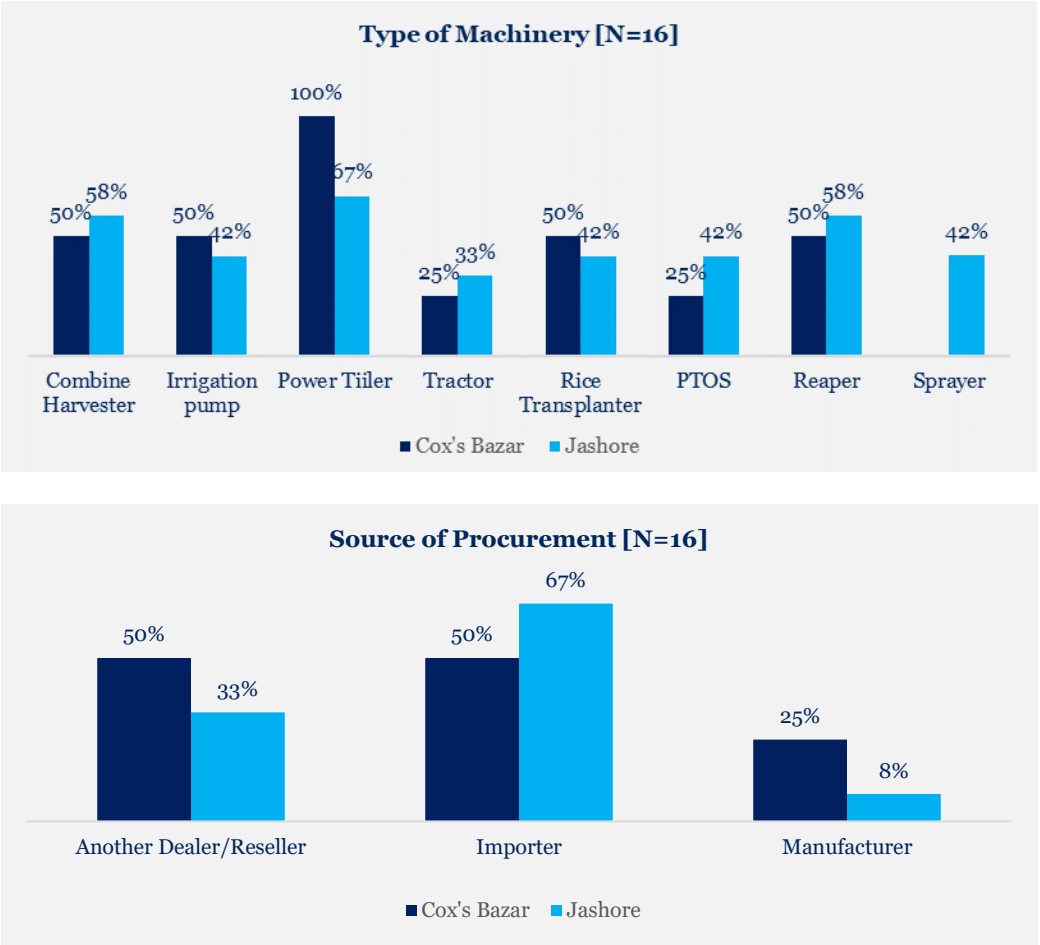


Figure 41 (a & b): Type of machinery and source of procurement of Dealers

- In Jashore, the size of the machinery stock differs widely amongst the dealers interviewed. There are a few large dealers with contracts with multiple machine manufacturers. They keep machines like Centrifugal Pump, Sprayer, Reaper, Shallow Engine, Power Tiller, Combine Harvester, Cultivator and spare parts.

- Out of the 4 dealers from Cox's Bazar and 12 dealers from Jashore, all dealers from Cox's Bazar sell Power Tillers while 50% of them keep Combine Harvesters, Reapers and Rice Transplanters. Similarly, 67% of the respondents from Jashore sell Power Tillers while 58% of them keep Combine Harvesters and Reapers. Depending on requirement, some dealers have a separate storage area in another location to keep large machinery. At times, they only procure machinery from importers upon confirmation of orders from customers.

- Since most of the machinery is imported, 50% and 67% of the respondents from Cox's Bazar and Jashore procure it from Importers, respectively, and very less (25% and 8%) from manufacturers. This indicates that the manufacturers are not producing any components or spare parts for the large machines such as Combine Harvesters and Rice Transplanters which are stocked/supplied by more than 50% of the respondents in those areas. While 50% and 33% of the respondents form the two regions get the machinery from other dealers, correspondingly. Some dealers order spare parts from Dhaka due to local unavailability.

II. Seasonality Impact on the Business

Cox's Bazar											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
73%	55%	55%	36%	18%	18%	9%	9%	9%	45%	82%	82%

Jashore											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
34%	34%	56%	53%	25%	9%	6%	6%	16%	28%	34%	25%

Lowest Sales	Medium Sales	Highest Sales

Table 21: Seasonality impact on the business of Dealers

- In terms of business activity, it can be seen that machinery sales are the highest from November to April. While in Jashore, around 54% of the dealers stated business activity to be high around March and April while in Cox's Bazar, over 70% of respondents claimed business activity to be the highest from November to January.

- Due to the seasonality impact in business, some dealers have opted to keep products of other industries as well and not restricting themselves to agri-machinery parts only. Some dealers have shifted to online media to deliver products across the country. One of the respondents has a YouTube channel where he demonstrates his inventory through videos and takes orders via his contact details posted in the description bar. Although most dealers market their products mainly through word of mouth and using flyers, posters, signboards within the area. Overall, there is an increasing intent among the dealers to focus on their marketing efforts.

III. Average Yearly Sales of Different Machinery

Machine Specific Average Yearly Sales						
Machinery Names	Cox's Bazar			Jashore		
	Quantity	Average Price (in '000 BDT)	Sales (in '000 BDT)	Quantity	Average Price (in '000 BDT)	Sales (in '000 BDT)
Combine Harvester	2	2,600	5,200	5	2,990	16,146
Tractor	14	1,200	16,800	190	1,314	249,613
Power Tiller	5	160	800	15	115	1,719
Reaper	7	180	1,260	21	136	2,850
Rice Transplanter	5	400	2,000	15	1,300	19,500
PTOS	-	-	-	12	36	432

Table 22: Average yearly sales of Dealers by machinery

- In general, except for Power Tillers, every other machinery has a bigger market in Jashore than Cox's Bazar. In Cox's Bazar dealers usually sell affordable and easy to keep machinery like Power Tiller, Thresher, Diesel Engine, Chopper and Gasoline Water Pump.

- Average yearly sales of Combine Harvesters and Tractors are at 16 MN BDT and 364 MN BDT in Jashore, while in Cox's Bazar, the value is at 5 MN BDT and 16 MN BDT, respectively. In Cox' s Bazar, in the case of big machinery like Tractor or Combine Harvester, buyers generally get them directly from manufacturers as the process for getting them on credit and accessing after sales service is easier.

- Dealers with exclusive contracts are typically smaller. Dealers have showrooms where they keep, display and sell their inventory.

IV. Commission Rates Received for Different Machinery

Proportion of Respondents Receiving Different Commission Rates				
Machinery Names	Cox's Bazar		Jashore	
	0-5%	5-10%	0-5%	5-10%
Combine Harvester	100%	0%	86%	14%
Power Tiller	50%	50%	80%	20%
Four-wheel Tractor	75%	25%	75%	25%
Rice Transplanter	100%	0%	100%	0%
Power Tiller Operated Seeder	100%	0%	100%	0%
Reaper	50%	50%	100%	0%

Table 23: Commission rates received by dealers according to machinery

- For all the machinery, most of the dealers receive a commission of 0-5%. Only in the case of Power Tillers, 50% of the respondents in Cox's Bazar take a 0-5% commission rate while 80% of the respondents in Jashore receive a commission rate of 0-5%.

- Dealers in Jashore work under commission with large players like ACI, Metal, Janata. They secure orders from customers and accordingly place requisition to respective suppliers. On the other hand, some dealers in Cox's Bazar buy the machinery at a discounted rate from companies like ACI, RK Metal, and Lusqi with the deal to provide services for it until warranty period while the rest operate in a similar model to that of Jashore. For bigger machinery that is not

possible to display, they take orders beforehand. The ones who purchase the machinery beforehand do not operate in a commission model, but they do keep a profit that is similar to the commission rate taken by others.

Actionable Insights:

- Over 30% of the dealer's purchase machinery from other dealers due to lack of funds or business history to acquire directly from manufacturers or importers. Lack of access to funds for dealers and difficult compliance factors of manufacturers/importers requires addressing.

- Seasonality impact depends on the machinery being used in the specific region. Average sales value of expensive machinery is higher in Jashore due to higher adoption rate than Cox's Bazar. Hence, more actions are required to improve awareness about mechanization in areas with low adoption of machines.

Financing Needs

I. Credit mechanism of dealers for their customers

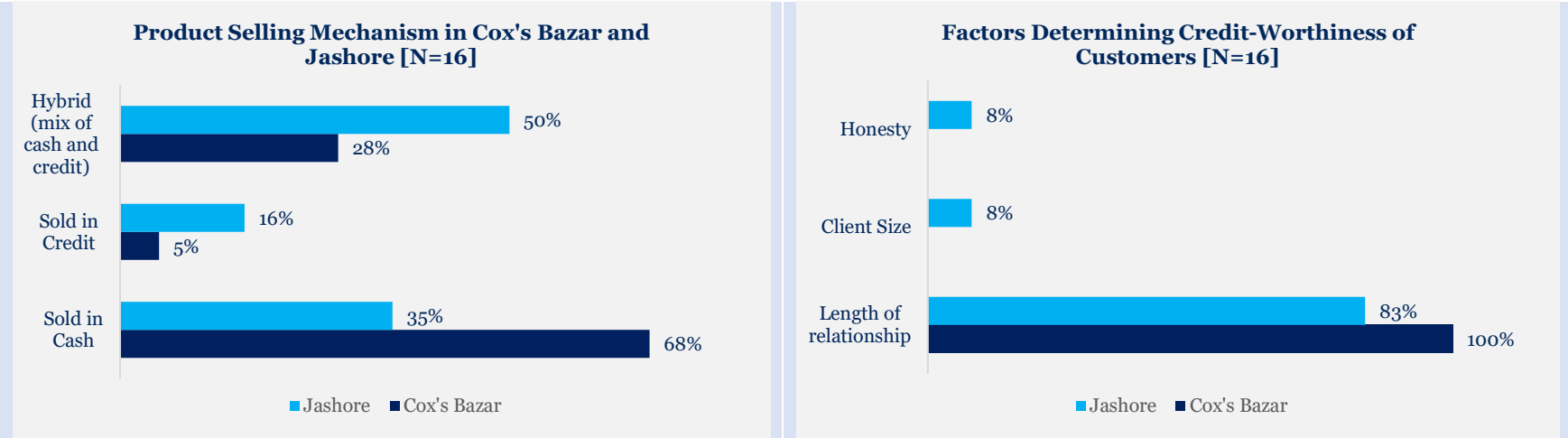


Figure 42 (a & b): Credit mechanism and factors determining credit-worthiness of dealers

- In general, most of the products, around 68%, sold in Cox's Bazar were in cash while 50% of the products sold in Jashore were done in a hybrid mechanism. Therefore, in Cox's Bazar, the current expenses incurred, and the working capital required for the business of each dealer to run are being covered by their monthly revenue earned since they operate mostly in cash. However, the dealers in Jashore have higher sales as they were large dealers with an established supply chain network from city to the rural areas of operation. Some dealers in Jashore leveraged this to diversify and act as dealers for other commodities. Due to product diversification, they are able to offer more credit to their end customers than those of Cox's Bazar.

- Credit worthiness is determined mostly by the length of relationship with the customer as stated by 100% and 83% of the respondents from Cox's Bazar and Jashore, respectively. However, due to previous default experience of the dealers, they are keener to provide credit only to customers they have known for a long time and who have displayed good credit behavior over a period of at least 2 years, as claimed by some respondents.

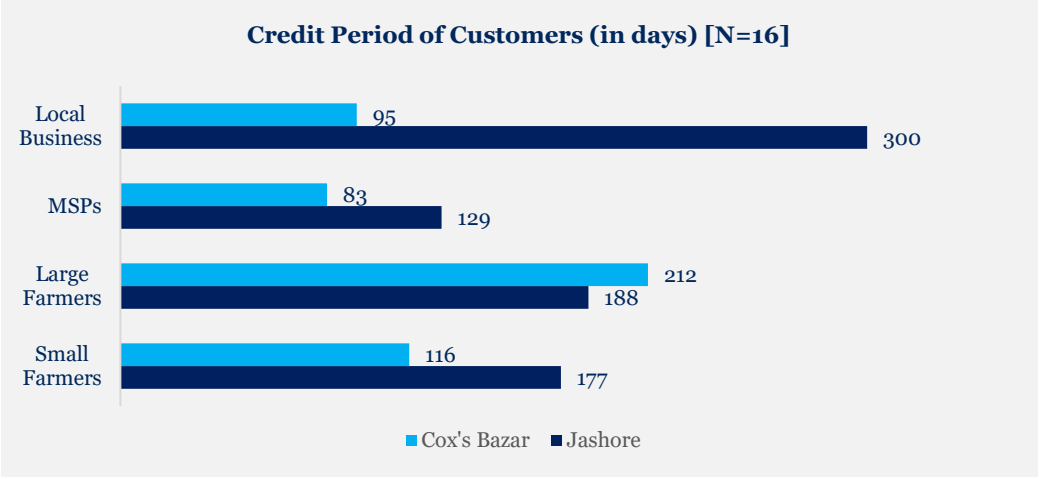


Figure 43: Credit period of customers of Dealers

- In Cox's Bazar, local businesses get the highest credit period days of nearly 300 days, while in Jashore, large farmers receive the highest credit period days of around 212 days. The credit period shows that dealers are more confident in providing longer credit periods to large businesses or farmers because they have either shown good credit behavior or are locally known people. However, in case of farmers, the dealers usually empathize due to the farmers' lack of ability to provide credit as some dealers were MSPs themselves and some still have employees who operate the MSP model.

II. Business aspirations and source of fund

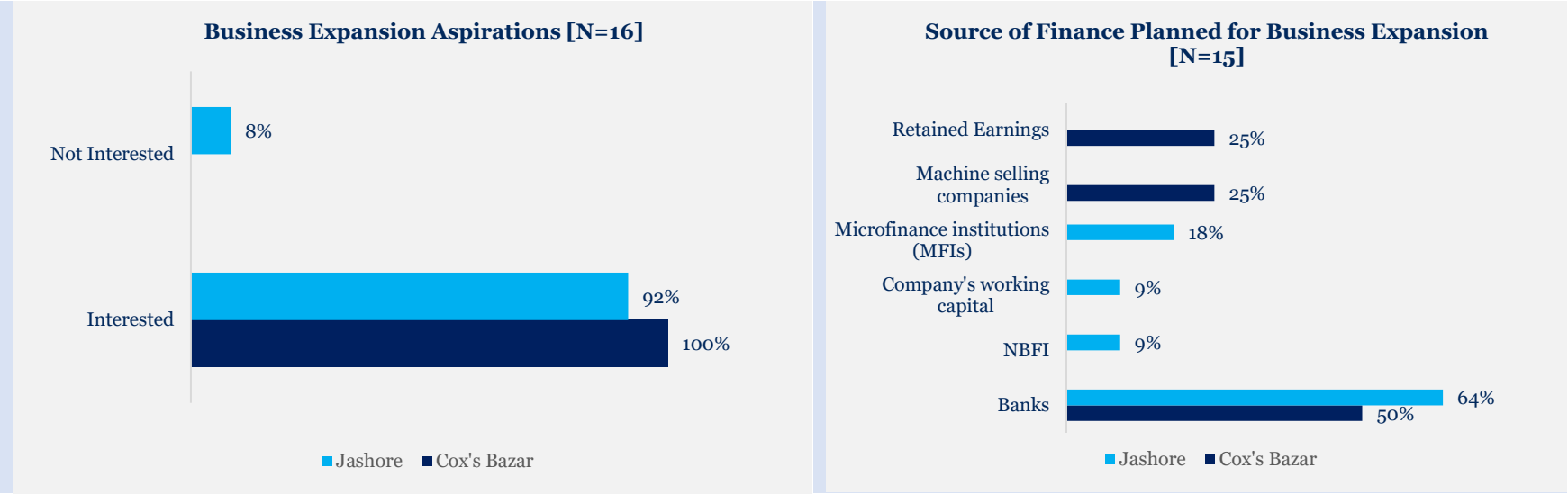


Figure 44 (a & b): Business aspirations and source of fund of Dealers

The figures above show the number of Dealer respondents who aspires to grow and the preferred source of finance of the 15 respondents who aspires to grow, respectively.

- In Cox's Bazar, every dealer was interested in growing their business with 50% willing to source from banks and the rest from machine selling companies and / or retained earnings. In the case of Jashore, 64% of the respondents want to procure funds from banks while 18% want it from MFIs for business expansion. This shows that the dealers are willing to reach the formal institutions for financing.

- Expansion of business is not possible without increasing the stock of machinery and spare parts. It might take them years to expand if they want to do it from their retained earnings. Hence, the demand for credit is high among them. Additionally, business earnings do not remain the same throughout the year due to seasonality impact. Even though the dealers keep spare parts used in sectors other than agriculture , revenue during off season goes down and they often have to operate from retained earnings.

Actionable Insights:

- Since products sold in hybrid mechanisms are low in Cox's Bazar, machinery purchase becomes difficult for customers. More dealers need to adopt hybrid product selling mechanisms and also provide longer credit repayment periods for farmers.
- Since the dealers are willing to take bank loans, banks should market their products in this zone to enhance financial inclusion of dealers.

Current Financing Status

I. Type and Source of Finance used for Machinery and Spare Parts Purchase

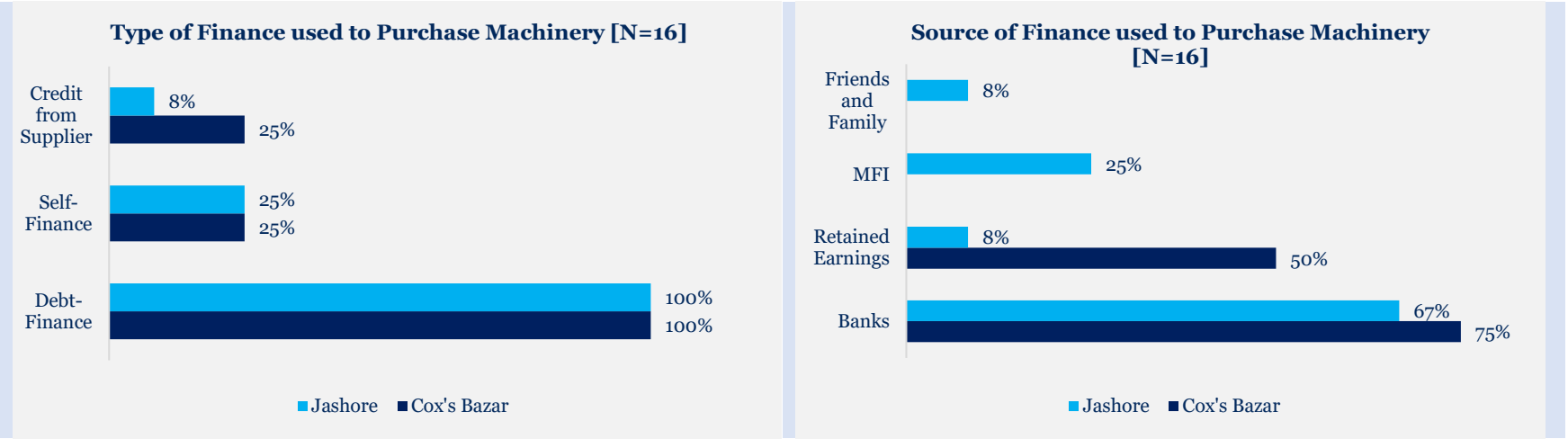


Figure 45 (a & b): Type and source of finance used by Dealers to purchase machinery

- For machinery purchase, 100% of the respondents have opted for debt finance while 25% also used self-finance. This means that they all have some form of debt in their balance sheet.
- In Cox's Bazar 75% of respondents used credit from banks and 50% used retained earnings. Similarly, in Jashore, 67% of respondents claimed to have taken funds from banks and 25% from MFIs. This indicates that dealers in Cox's Bazar are currently relying on retained earnings to fund their business, although they expressed interest to switch to bank funding, as seen in the previous section.

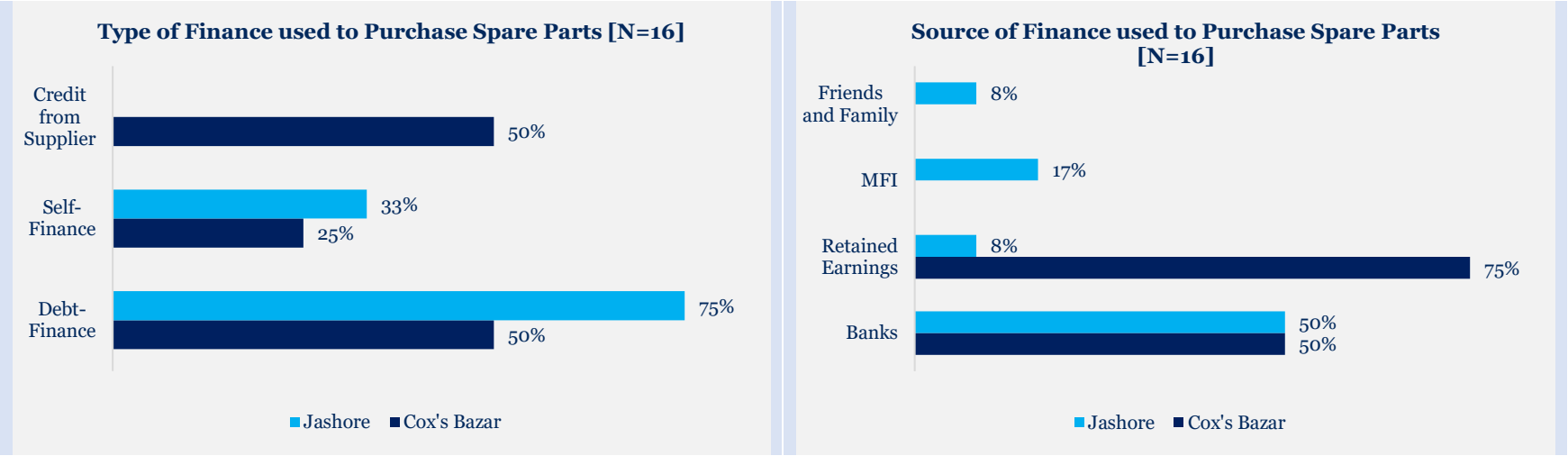


Figure 46 (a & b): Type and source of finance used by Dealers to purchase spare parts

- For spare parts purchase, 75% of the respondents have opted for debt finance from Jashore while 25% among them also used self-finance. In Cox's Bazar 50% of the respondents used credit from banks and 75% used retained earnings. Similarly, in Jashore, 50% of the respondents claimed to have taken funds from banks while 17% used credit fromMFIs. Similar to machinery purchase, dealers in Cox's Bazar are relying on retained earnings for spare parts purchase too. This leaves scope for greater promotion of bank financing in these regions.

II. Eligibility Requirements for Dealers to get Credit

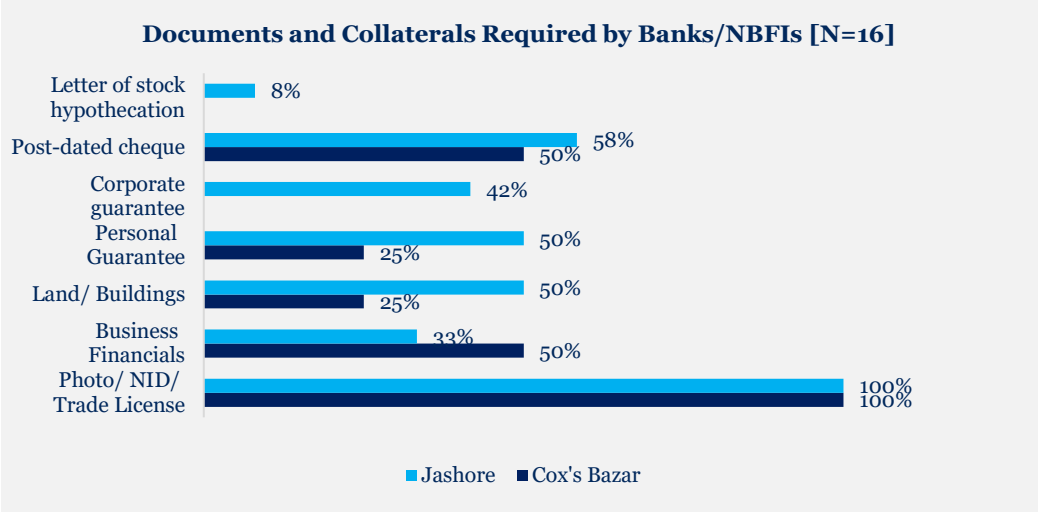


Figure 47: Documents and collaterals required by banks and NBFIs for Dealers

- Apart from NID, Photo and Trade License, in Cox's Bazar, 50% of the respondents claimed business financials and post-dated cheques were the main documents required by banks and NBFIs. On the other hand, in Jashore around 50% of the respondents claimed provision of collateral and personal guarantees were required by banks and NBFIs before loans could be given.

- In Jashore, in terms of financing, they want financial institutions to put more importance on business performance rather than collaterals when deciding whether to approve loans. In some cases, physical distance from the dealer's point of contact makes it hard for banks to give out loans. To enable dealers in Cox's Bazar to expand their businesses they require financial assistance, but they are unable to obtain this due to the businesses being mostly new businesses which have not yet established a reputation and financial records. Further as they are relatively new and still small businesses they have not yet built up enough property assets to provide property as collateral for loans. Thus, even if business financials are good, they often fail to meet the requirement of business maturity.

Actionable Insights:

- Sources of finance used for machinery and spare parts purchase are dependent on retained earnings. This is a positive aspect, however, lack of access to finance hinders their growth prospects. Hence, more funding from financial institutions will improve their business growth.

- Dealers often do not have enough collateral to receive the desired amount of loan. Therefore, credit products should be designed in such a way that dealers receive funds with low or no collateral.

Current Pain Points

I. Factors Suppliers Check while Offering Credit

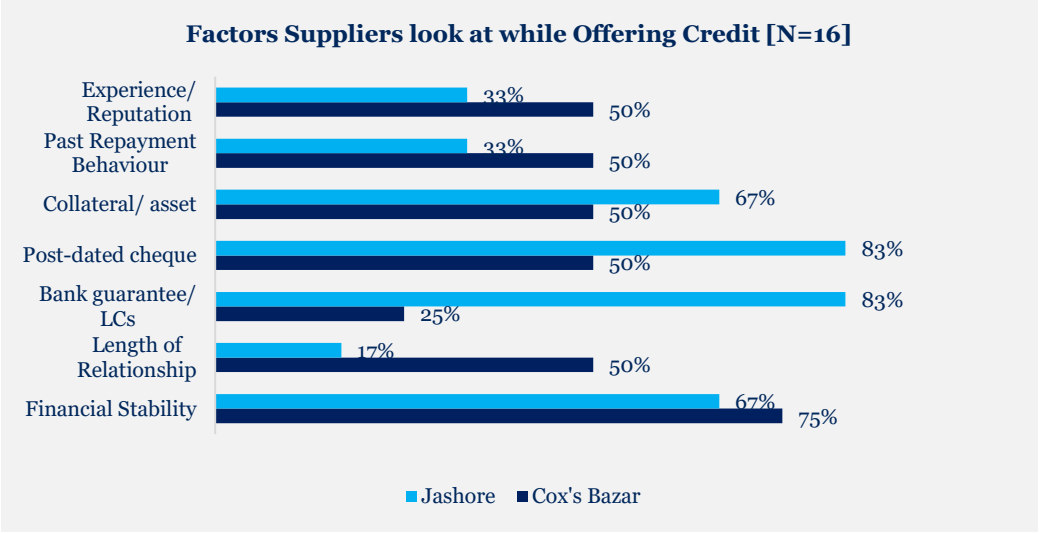


Figure 48: Factors suppliers look at while offering credit to Dealers

- Suppliers mostly consider factors such as financial stability, bank guarantees and post-dated cheques. In Cox's Bazar, 75% and 50% of the respondents claimed financial stability and post-dated cheque to be factors suppliers require. While in Jashore, 67% of the respondents stated financial stability and 83% bank-guarantees to be important factors considered by suppliers.

II. COVID-19 has hit all the respondents negatively due to lockdowns and lower sales volume.

III. Loan Rejection Rates and the Challenges Faced in Securing Credit from Financial Institutions

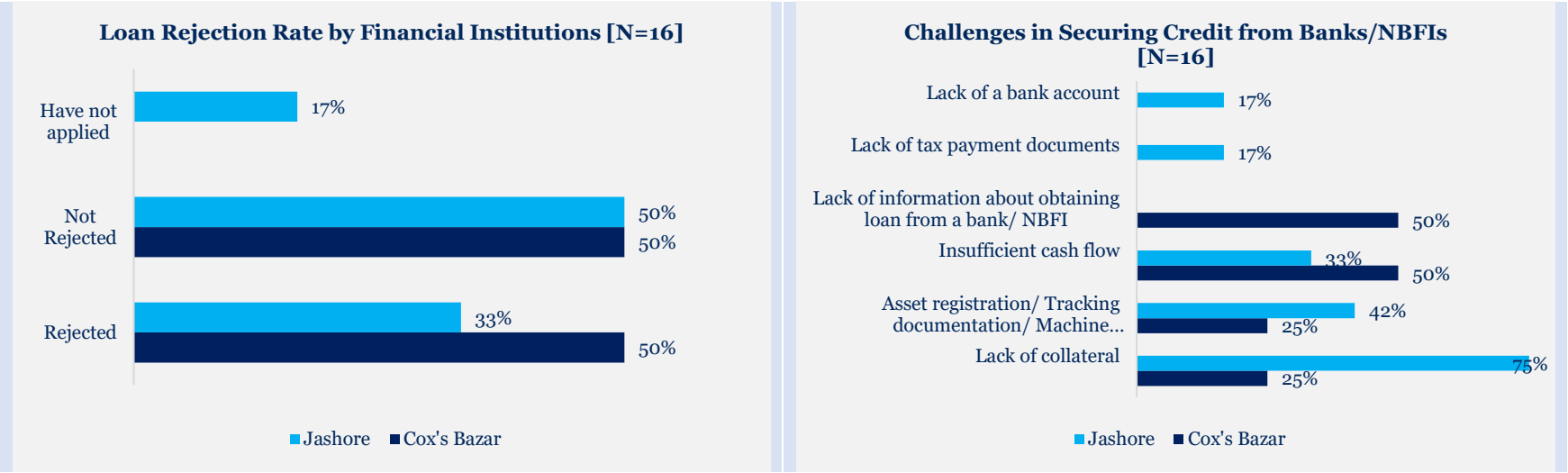


Figure 49 (a & b): Loan rejection rates and challenges in securing credit from financial institutions of Dealers

- In Jashore 33% and in Cox's Bazar 50% of the respondents had their loan applications rejected, r. The major reasons for rejections were not always informed to the respondents. However, those who were aware of the reasons mentioned that lack of collateral was the main reason. In Cox's Bazar, lack of experience in this business was also a major reason for having loan applications rejected.

- The primary challenges for securing credit as stated by 50% of the respondents in Cox's Bazar is due to insufficient flow of funds and lack of knowledge in obtaining loans. On the other hand, 75% of the respondents in Jashore claimed lack of collateral and 42% thought asset registration were the main challenges to securing credit. In addition, as dealers operate on an order-basis model, their cash flow fluctuates from year to year making it difficult for them to demonstrate that they are a viable business capable of repaying loans.

IV. Challenges Faced by Customers in Purchasing Machinery

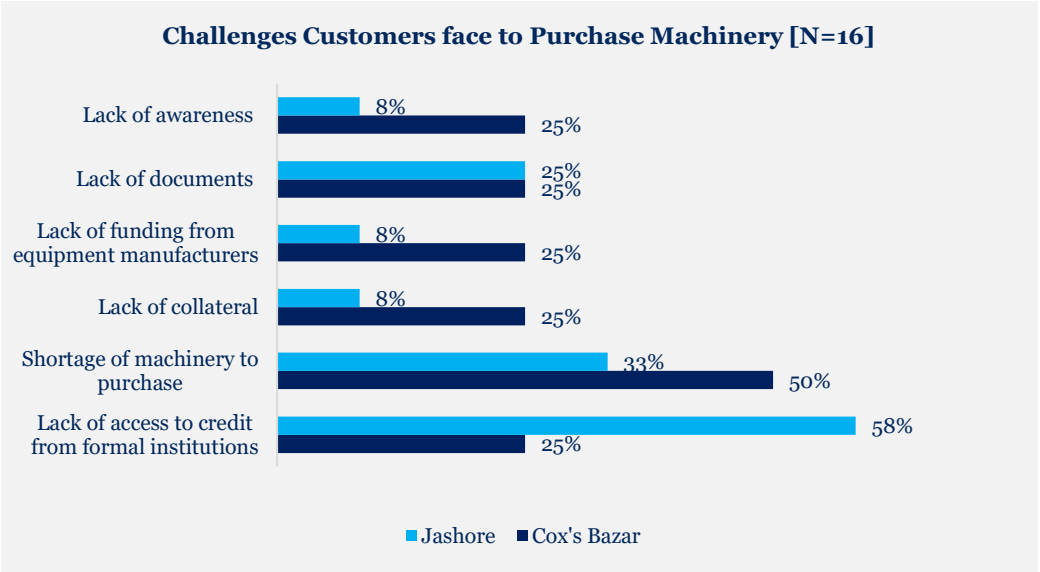


Figure 50: Challenges faced by customers of Dealers in purchasing machinery

- In general, dealers claimed lack of access to credit and shortage of machinery to be primary barriers in machinery purchase. In terms of source of financing, most of the respondents in this region wanted to take it from the bank as the interest rate is lower than from MFIs.Since the major challenge is lack of access to credit from formal institutions, it is imperative that the reasons described earlier in the section such as lack of collateral, insufficient cash flow act as hindrances to credit access which consequently acts as a barrier in purchasing machinery.

Actionable Insights:

- Higher levels of loan rejections persist due to lack of collaterals, which in return reduce the ability of dealers to get access to credit from formal institutions. Hence, financial products should be made based on the business financials of the dealers and not on the collaterals they have.

3.6. Findings and Insights from Respondents (Importers and marketeers)

General Business Profile

One of the key groups of players in the agri-machinery value chain are the machinery importers and the marketeers. These companies import large machinery such as tractors, combine harvesters, rice transplanters, which are not produced domestically. However, most of these players also have a manufacturing wing where smaller machines like threshers are manufactured. The importers keep a good mix of products that have seasonal demand (reaper) and those that can be used year-round (such as maize sheller).

The product pricing varies depending on the quality of the products. Pricing for imported machinery of average quality is given below:

Name of Machine	Average Price (BDT)
Tractors	1,000,000 to 1,250,000
Combine Harvesters	2,000,000 to 2,800,000
Rice Transplanters	300,000 to 400,000
Threshers	25,000 to 2,500,000
Mini Power Tillers	80,000 to 90,000

Table 24: Average prices of imported machinery

Importers and marketers majorly have two selling channels: direct sales to customers through their regional offices either through cash or credit or hire purchase schemes; and the next channel is through dealer stocking based on either purchase or commission-based model. However, some players consider the subsidy-based sales of machines to be a separate sales line. A third and a growing channel is the online marketplace that few players are tapping into to reach customers across the country. A fourth, but small sales channel is the government tender related works for some manufacturers.

Business Model

The financing needs of the importers arise from both their forward and backward linkages since credit sales and purchase is essential for this business where the majority of the products have season-based demand and are sold through multiple channels. All the importers that the LCP team interviewed consider the seasonality effects on their business starting from planning their procurement of imported machines, manufacturing of the smaller machines, to offering government subsidized machines, and to stocking the dealer channels. It is evident that they all prepare for upcoming seasons and take orders before a season begins and deliver before the season too. For the smaller machines, these players stock semi-finished goods and start assembling one month ahead of the specified season. For subsidy-based machines, the stock has

to be ready three months ahead of season. Similarly, irrespective of being subsidized or not, imported machinery takes two to three months to reach the importers.

In terms of procurement of imported machines, these players import via letter of credit facilities from banks. Common importing countries are India, China, and Vietnam. For instance, ACI motors imports machines and respective spare parts from China and Vietnam (Yanmar brand machines), while Metal imports Tafe and Eicher brand tractors from India and World brand combine harvesters from China. If we look at the sales volume of these companies, one of the importers sells around 3000 tractors per year, 1000 Combine harvesters in the last 2 years (i.e average 500 per year), 30 Rice transplanters sold in the last 3 years (i.e., average 10 per year), more than 200 Reapers sold in the last 3 years (i.e., average 66 per year).

In terms of sales channels, different importers have different policies in terms of credit extension. These policies vary based on type of products and the price, relationship with the end customers, involvement of subsidized machines, relationship with dealers. Large importing companies conduct 80% to 90% of their business through their own sales channel and remaining 10% to 20% via dealers since credit extension is required for dealer business. However, few companies who have their manufacturing capacity for small machines, conduct 40% to 60% business through dealers. These manufacturers have low sales during February-March & August-September but October-December & April-June are peak seasons for their sales.

Importers as Financing Actors for the Forward Market

The figure below outlines the process of machinery acquisition through the subsidy program. The main actors through the process are importers, Government of Bangladesh, Department of Agricultural Extension, Ministry (DAE), and the farmers/buyers. Completion of the series of steps takes around 3-5 months.

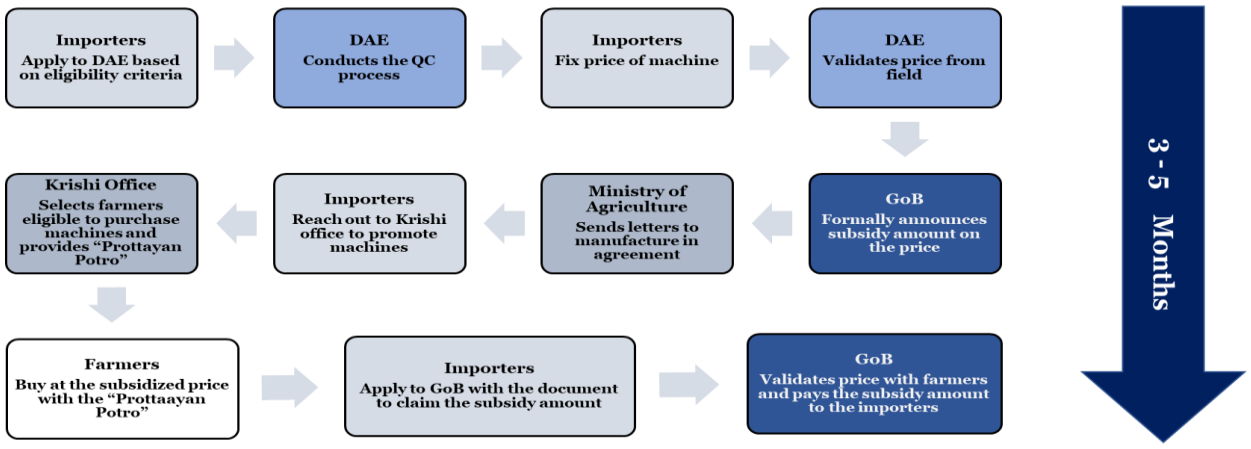


Figure 51: Process map of machinery purchase through subsidy

The post subsidy amount for machines is taken in hybrid form mostly. There is a downpayment of 30 to 40% which varies based on product pricing and the remaining amount taken in

instalments ranging from 18 to 36 months. Some importers give the first 6 months interest free, whereas others charge interest rates including the bank interest rate as well.

A similar mechanism exists for hire purchase where the down payment is taken on the full price of the product. For example, if a tractor costs BDT 10 lac, buyers pay 30% down payment and the remaining in EMI (Equal Monthly Instalments) for 18 months. The assessment team of the importers evaluates financial background, political involvement, income source and amount and seasonality of buyers for hire purchase schemes. These companies usually have a recovery team to recover the credit amount from the buyers. These teams visit the buyers monthly or seasonally, arrange incentives such as free spare parts on good repayment behaviour.

Current Pain Points

Pre-stocking for subsidy-based machines and subsequent time to claim the subsidy creates cash flow gaps for importers

The mechanism for subsidy-based machines creates a time gap in claiming the subsidy amount and also claiming the remaining amount from end customers in case of credit sales. The machines have to be stocked up to three months ahead of the season and the volume stocked is based on an estimated product demand in the different regions. Once the products are sold to the farmers, it takes further three to five months to claim the subsidy amount since validation is conducted from the government office. Hence, the cash flow recovery takes six to eight months for these importers.

Recovery of payment from forward market creates cash crunch when preparing stock for upcoming seasons

For some of these importers, the success rate for the recovery of credit given on sales to end customers is about 60%. In case of hire purchase schemes for more expensive machines, end customers arrange the down payment by taking loans. Frequently they find it difficult to pay the hire purchase instalments. Moreover, the importers have credit lines with banks for importing, where they have to invest two to three months ahead of season, but due to low recovery rate the importers face difficulties in opening new LCs (letter of credit) for stocking up machines for the upcoming seasons. The low recovery rate for importers is a major hindrance when they want credit from banks.

In addition, sales through the dealer channel seems to be on the decline due to the long credit period recovery. Almost 100% of the dealers affiliated with these importers take credit sales but over time there have been instances when recovery took more time than expected. Some manufacturers are moving away from extending credit until two years of relationship with the dealers has been established. Similarly, dealers usually want to stock up in bulk but because the importers do not believe the dealer will repay on time importers prefer to supply smaller quantities than those requested by dealers., Also importers have favored regions where they know demand is greater than other regions. They therefore restrict supply of machines to those less favoured regions.

Subsidy-based machines cannot be recalled from the market in case of poor repayment behavior from end customers

For products that are subsidy- based, importers cannot impose any pressure to recall the products to recover the loan amount since the GoB owns a large part of the machine (50% to 70%) for 3 years. End customers are aware of the aforementioned fact and take undue advantage by delaying instalments.

Hire purchase schemes without support from financial institutions is not feasible for all importers

The hire purchase schemes run by these importers are from their own balance sheet financing without any direct support from financial institutions. It is evident that these importers have credit lines with banks for importing where they have to invest two to three months ahead of season. At the same time, they are also acting as financiers for the end customers who buy these machines. Therefore, defaulting by end customers greatly affects the ability of importers to repay the loans they have acquired from banks. While it is possible for some large importers to provide hire purchase schemes, some manufacturers/importers have stopped giving credit sales to end customers due to past experiences of low recovery rates. For instance, one company takes full cash payment from farmers for the subsidy-based machines. Some are moving towards online sales for smaller machines where they receive cash in two or three days.

Import dependency for procuring spare parts for the relatively new machines in the market

Machines such as Combine Harvesters are a relatively new technology in the market. Therefore, machinery manufacturing businesses in Bangladesh have only just started to make spare parts for combine harvesters. There is also a lack of skilled manpower and the required manufacturing machinery needed by machinery manufacturing businesses to make the spare parts for these machines. Importers consider that to ensure they can offer customers good after sales services they should buy them from local manufacturers instead of relying on the import of spare parts but to be able to do that the importers think that local manufacturers will require considerable technical and financial support to enable them to develop the capacity to produce spare parts that meet their quality standards and at a competitive price.

3.7.Summary of Insights from the Agri-Machinery Value Chain Actors

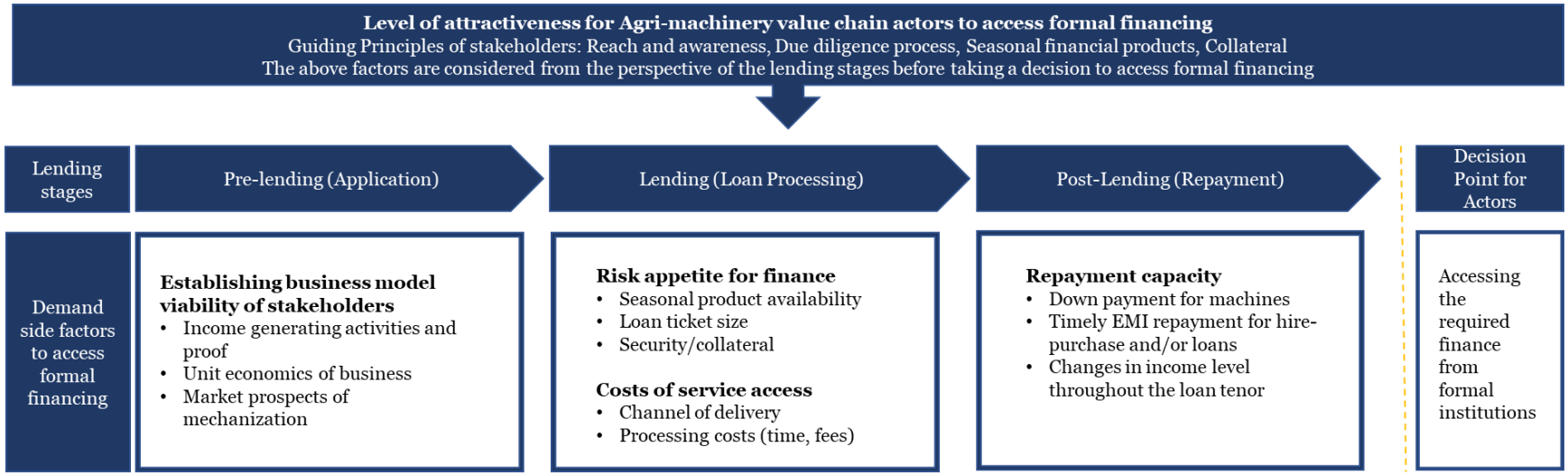


Figure 52: Flowchart of access to formal financing of demand side actors

The figure above showcases the lending stages that FIs have set to analyze before providing a loan. Demand side actors such as Workshops, Foundries, Dealers and MSPs have to consider meeting the criterias set by FIs in order to get access to formal financing.

In the pre-lending stage, loan seekers are required to demonstrate they have a viable business model that makes them eligible for the credit. In particular they have to provide proof of their income generating activities along with the market prospects. Secondly, in the lending stage, loan takers have to check if they have enough collateral as set by the FIs to get access to the size of loan they want, additionally, they also have to consider the delivery channel (branch and agent points) they want and the processing costs (time and fees) they will incur when obtaining the loan. Lastly, in the post-lending stage, borrowers must check that they have the capacity to repay the loans considering the size of the down payment they have to make to purchase the machine, the seasonality of income generation and their ability to meet the EMI repayment criteria set by FIs.

The stakeholders are clustered into two groups: enterprise level players and individual level players; where, enterprise level players are formal businesses such as Workshops, Foundries and Dealers, and individual level players are MSPs.

Financing from Banks/NBFIs/MFIs

Enterprise Level Players

Financing aspects of Workshops, Foundries and Dealers

Pre-lending (Application)	Lending (Loan Processing)	Post-lending (Repayment)
Establishing Business model viability: **Workshops, Foundries** and **Dealers** need to provide documents such as business financials, collaterals to acquire loans from Banks and NBFIs. In case of MFIs very little documentation is required. For this reason **Workshops** and **Dealers** often finance from MFIs even though interest rates are higher. Due to higher default rates in the industry, financial institutions prefer provision of collateral rather than business financials and the length of business activity.	Risk appetite for finance: As the business of **Workshops**, **Foundries** and **Dealers** is very seasonal, they often fail to pay during the off-season. Therefore, the risk of defaulting on loan products that do not consider seasonally based business models is higher than products that are designed to allow repayments that vary according to seasons. Additionally, lack of sufficient collateral leads to limited loan supply from financial institutions. **Foundries who** have higher diversification in their product line than **Workshops** and **Dealers** have a lower risk of defaulting compared to **ABLE SMEs** and **Dealers.** Cost of service access: **Workshops, foundries** and **Dealers** access loans from local branches, agent banks and MFI offices. Since a number of them do not generally possess knowledge about the documentation, they often have to pay fees to acquire them t from banks and NBFIs.	Repayment capacity: As **foundries** have a huge portfolio of products, they do not usually incur problems regarding loan repayments. However, **Workshops** and **Dealers** rely on seasonality to repay the loans. As most of the products are EMI based, they often find it difficult to repay loans during off-seasons. As banks require collateral, small businesses with limited assets refrain from taking loans from banks but rely more on MFIs which have repayment procedures that are more flexible than banks.

Table 25: Financing aspects of workshops, foundries and Dealers

Individual Level Players

Financing aspects of Machine Service Providers (MSPs)

Pre-lending (Application)	Lending (Loan Processing)	Post-lending (Repayment)
Establishing Business model viability: MSPs in general do not get credit from banks due to lack of collateral as the machinery bought is not taken as collateral by financial institutions. Hence, they mostly rely on the retained earnings of their businesses. Apart from collateral, banks also take business financials that MSPs often do not keep proper track of. This makes it difficult for banks to provide loans as there are no reference points provided by MSPs that can be used to assess the creditworthiness of customers. Another option for MSPs is to procure funding from MFIs who do not require heavy documentation for loan disbursement.	Risk appetite for finance: The loan size required by MSPs is usually the down payment needed by machinery suppliers when purchasing a machine. However, due to lack of collateral they often do not obtain loans from banks. As loans for the purchase of machines are difficult to obtain, MSPs often use the funds raised from loans intended for crop production to purchase machinery. Costs of service access: Due to lack of awareness about loan products, they often experience delays in acquiring credit from banks. Additionally, since most of the MSPs are informal business operators, they incur costs in acquiring documents that are needed for financing.	Repayment capacity: MSPs completely depend on the income earned from the machinery bought on credit to repay the loan. However, since income generation is seasonal while loans are EMI based, they often fail to pay during the off-season. This fluctuating income often leads them to default on loans. For this reason, banks generally give priority to creditors who can offer good business financials and collateral. Additionally, due to poor after sales service of machinery, machinery breakdowns are frequent with the result that time is spent on repairing machines instead of being used to generate income. This impacts on the capacity of MSPs to repay loans.

Table 26: Financing aspects of Machine Service Providers (MSPs)

Chapter 4: Supply Side Analysis

4.1. Financing Landscape

Types of Players in the Financing Landscape:

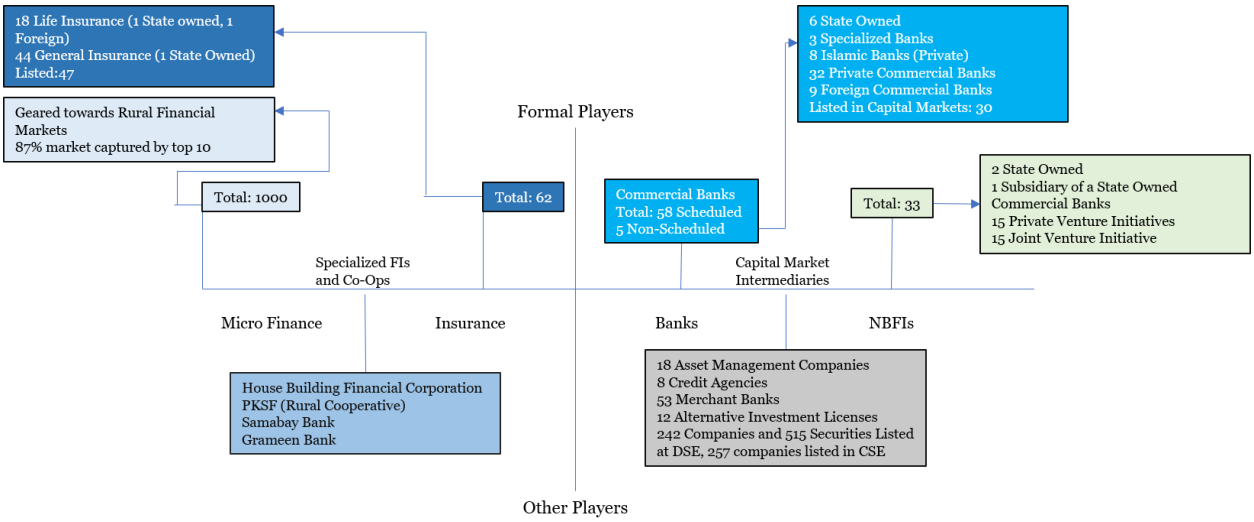


Figure 53: Players in the financing landscape

Source: Bangladesh Bank, 2021, Monthly Report on Agricultural & Rural Financing

The above diagram shows the actors in the supply side of formal finance in the landscape. There is a total of 58 scheduled and 5 non-scheduled commercial banks in Bangladesh, 33 NBFIs, of which 2 are Government owned

Despite the large number of players, the formal MSME finance gap is 67.3 percent. In Bangladesh, MSMEs' access formal finance through banks (public and private), NBFI, and MFIs. The Central Bank sets agricultural credit disbursement targets to encourage banks to venture into this sector and provides refinancing facilities to the participating banks. The disbursement target of all State-Owned Commercial Banks (SOCBs) and State-Owned Specialized Banks (SOSBs) has been fixed at 42.01% total agricultural credit disbursement target (given at actual amount) and that for Private Commercial Banks (PCBs) & Foreign Commercial Banks (FCBs) is 57.99%. However, this target does not specify agri-machinery specifically, as confirmed by interviewed banks. Most loans in this sector are for poultry, fisheries, dairy, and crops based loans[7][8].

4.2. Current Financing Mechanisms and Delivery Channels

Comparison of Banks, NBFI, and MFIs

Banks and NBFIs have different risk appetite for serving the enterprise level (Workshops and Foundries) and individual level players (MSPs). Banks offer SME loans to enterprise level players based on a debt burden ratio of around 50%. But the ratio varies from bank to bank depending on

their risk appetite. SME loans in the agriculture sector are non-collateralized in nature and are given at an interest rate of 9%. The short-term loans are of varied repayment period: 12, 28, 24 to upto 36 months. The aforementioned SME loan products are applicable for all businesses and not modified for the Workshops or Foundries or even the MSPs. While some banks offer collateral free loans up to BDT 10 lacs, some offer up to BDT 50 lacs. Meanwhile, some NBFIs offer lease of machines without collateral for loans less than BDT 1 Crore to SMEs and SMEs/foundries but have not ventured into serving the MSPs due to challenges in payment and recovery of loans. Moreover, the induction furnaces used by foundries cannot be leased whereas electric furnaces can be leased. They can offer these loans under the refinancing scheme of Bangladesh Bank at 7% where the Bangladesh Bank charges 4% and the spread for NBFIs is 3% in general. Conventional banks charge compound interest rate but Islami banks offer simple interest rate which benefits the borrowers because compound interest rates increase the total repayable amount more than that of simple interest rate.

At the pre-lending stage, banks and NBFIs have a similar set of requirements for businesses to establish their viability. For both banks and NBFIs, common documents for application and assessment include trade licences, NID, TIN, CIB report (which reveals the borrower credit history). In case of SME loans, which are unsecured, the documentation requirements are easy, unlike secured loans where the documentation becomes much more detailed owing to the collateral valuation and such property related documents.

However, one of the crucial lending decisions comes from the financial documents banks and NBFIs acquire from both enterprise and individual level players to assess the business position based on various ratios such as liquidity and profitability ratios. For foundries/MSMEs/ABLE SMEs, banks also take fire license and environmental clearance, which are additional documents not asked for from MSPs. In case of MSPs, local verification from chairman and/or someone who is already the respective bank's client is required. For Islami banks, the branch relationship managers provide extensive support in making the business finance-ready through support in preparation of required documents based on the information provided by prospective borrowers. All these documents essentially serve the purpose of ensuring the financial institutions that the loans can be repaid in a timely manner by the borrowers. Hence these documents serve the purpose of due diligence conducted by financial institutions to ensure a thorough KYC (know your customer) process.

However, in terms of service delivery, banks deliver through their branches and agent banking channels, although the respondents the LCP team has interviewed did not take direct exposure in agri-machinery financing yet through agent banking. However, in most cases, the processing of bank/NBFI loans takes a minimum of 1 week and can go upto a month due to processing being done through a centrally operated risk monitoring system of banks/NBFIs, irrespective of the delivery channel used.

Similar to banks and NBFIs, the MFIs also disburse agricultural loans but there are no tailored products specifically designed for agri-machinery unlike crop-based loans. However, the MFIs are aware that their members/borrowers use the financing for agricultural production l to purchase machinery. Other than service delivery through MFI branches, the MFIs also arrange distribution

of agri-machinery from the manufacturers/importers, but the MFIs are held accountable for after-sales service of machinery. While for banks/NBFIs the borrowers have to reach out to banks for availing services, MFIs reach out to public gatherings or shopping places to find eligible borrowers. Thus, an MFI loan officer does the KYC process by visiting the individual's house/marketplace, assessing his/her earning potential and from there starts the decision process of whether to give out a loan. They ask for basic documents including NID, and NID of verbal guarantor for small loans. For business owners, they sometimes ask for the trade license, rent/ownership contract of the shop and utility bills. MFIs deliver through their branches and loans are processed in 2 to 3 days and in case of repeat loans, even in one day. Some MFIs are currently exploring the potential of integrating MFS in their loan collection process, following the example of a large MFI.

4.3. Bottlenecks in the Current Financing Mechanisms

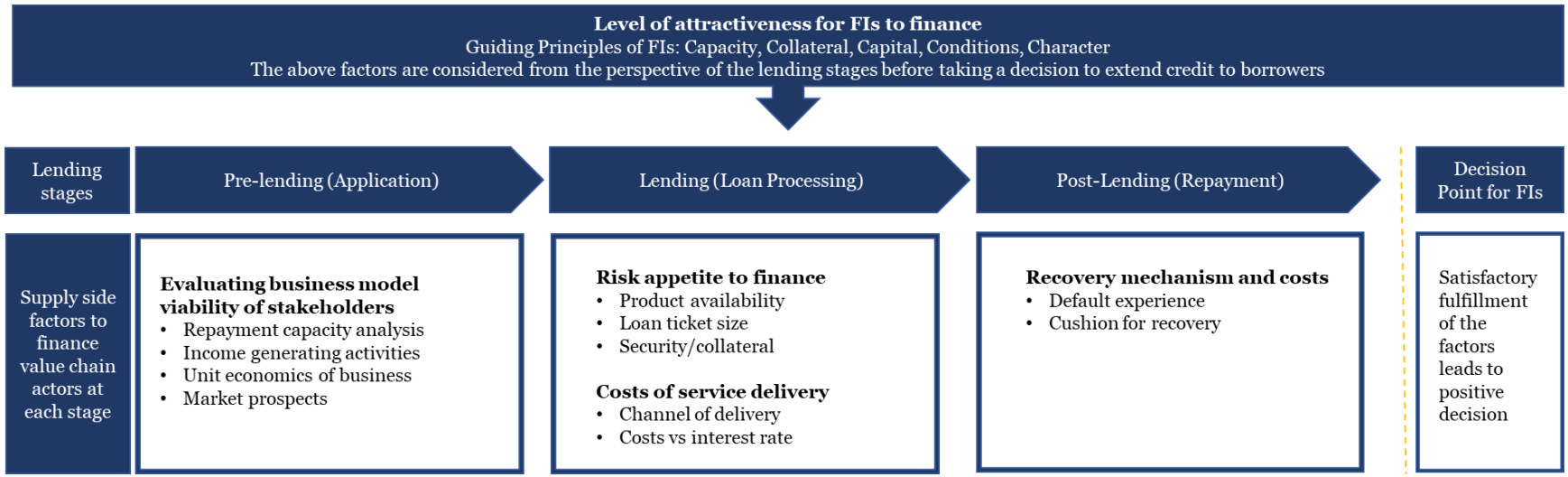


Figure 54: Flowchart of financial institution's incentive to finance

The figure above shows the framework used to assess the different factors that the financial institutions (FIs) consider at each stage of the lending process. FIs consider the possible outcomes of each of the factors for each stage before actually disbursing the loan.

At the pre-lending stage, the FIs conduct the repayment capacity analysis, identify the income generating activities of the business, and the market prospects of the business. This leads to a holistic evaluation of the borrower's business viability. In the next stage, the decision to proceed with providing a loan is based on how much risk the FI is willing to take. This decision takes into account the amount of collateral to be provided by the borrower and if there is a specific loan product available to cater to the needs of the borrower. Moreover, the delivery channel costs (human resources, branch set up and maintenance) vis a vis the interest rate charged are important considerations too. Finally, the FIs consider that if the loan is disbursed what are the repercussions in case of default by borrowers. Any previous experience of having bad loans (default) in the business segment may act as deterrents to lend unless there is collateral that can be used to recoup the loan amount. In the following sub section, the players are categorized into enterprise and individual level players, alongside their source of credit.

Financing Enterprise Level Players

Importers and Marketeers

The importers and marketers are financed by the banks and NBFIs and not MFIs. The following table summarizes the factors considered by the FIs in lending credit to importers and marketers along with challenges faced:

Pre-lending (Application)	Lending (Loan Processing)	Post-lending (Repayment)
Business model viability: Importers and marketeers, including large manufacturers obtain working capital from banks including LCs to import machines. These players are well established with years of experience, have a strong balance sheet to support their business, have high assets, and require a high-ticket size of loans. These are favorable conditions for the bank. However, when some importers cum manufacturers have low recovery rate from their respective forward market, banks are reluctant to provide more LCs for the import of new machinery. In addition, quality of machines imported is also important, since they prefer more popular brands such as Buhler over Chinese brands. At times, the demand analysis from the borrower's end is incomplete or does not justify the loan requirement.	Risk appetite to finance: As the large importers are able to provide collateral and have a long-standing relationship with banks, banks are more willing to finance these companies than small companies such as Workshops and MSPs. For example, some NBFIs provide unsecured loans for machines worth up to BDT 1 Crore. But these machines cannot be considered as collateral as they have a low resale value after being used for 6 months to 1 year. However, banks are not involved in the credit facility system (hire purchase) that these companies extend to their forward market. Banks do not directly finance the end customers of these importers. Costs of service delivery: These players obtain corporate loans where loan size is much higher than typical agriculture loan (BDT 10 to 20 lacs as reported by some respondents). However, NBFIs sometimes	Recovery mechanism and costs: FIs have not reported any default experience with importers. However, in attempts where the banks tried to finance the end customers of these importers, banks reported poor recovery of loans. In that case the recovery burden was on the banks, and not on the importers. The importers did not guarantee any payment on behalf of their end customers. Since machines cannot be taken as collateral (only hypothecated), except for tractors, banks are unwilling to finance loans for these machines. Similarly, for machines that are subsidized, companies cannot transfer ownership since the machines are largely owned by the GoB. In such cases, importers cannot recall the product for 3 years if they fail to collect payment and subsequently repay their bank loans.

	face challenges in verifying the price of machines and resistance from borrowers to make vendor payments. Vendor payment is essential for FIs to claim their payment under the central bank refinancing scheme for agri-machinery purchase of 4% since FIs are accountable to the central bank for fund utilization.	

Table 27: Financing enterprise level players: Importers & Marketeers

Foundries, Workshops, and Dealers

Source of finance includes banks, NBFIs, and MFIs for small scale businesses.

Pre-lending (Application)	Lending (Loan Processing)	Post-lending (Repayment)
Banks and NBFI		
Business model viability: Although the loan size varies for SMEs, MSMEs, and dealers, the credit worthiness of borrowers are assessed considering quantitative factors (business position, last 2 to 3 years financials including balance sheet, years of involvement in business, loan situation) along with qualitative factors (market reputation of entrepreneur, family background, years of business, switching between businesses, present for the last 10 years in the same location). For SME clients, there are non-collateralized loans up to BDT 50 lacs. However, they often lack a balance sheet to prove business viability as a result payment vouchers have to be checked.	Risk appetite to finance: Banks and NBFIs do not have any mandatory requirement from the central bank to disburse for agri-machinery targeted loans. As such no specific products are available for this group. The light engineering portfolio follows the same guidelines as SME loans where Debt burden ratio (around 50%) is considered as a guide by some banks. The quantitative aspect is around 40% for some institutions and collateral is a prime guarantee. Costs of service delivery: Banks and NBFIs disburse loans through branches in the area where the loan applicant is based. However, it is possible to utilize	Recovery mechanism and costs: Banks and NBFIs have not reported significant challenges regarding recovery from workshops and foundries. However, they are aware of the long credit periods and challenges that MSPs face in repaying the dealers/foundries/workshops, which consequently affects the SMEs and MSMEs. Although foundries and workshops are able to provide collateral, often their expansion plans are hindered by their inability to provide land as collateral.

	agent banking channels since there is no additional upper limit of disbursement. Agent banks can disburse the same amount of loans as their counterpart banks.	
MFI		
Business model viability: MFIs finance some SMEs and dealers based on their income generating capacities. MFIs focus more on the income earning potential of the business along with expenditure and loan status to determine the loan size and repayment terms. Loan officers also do a physical verification before deciding on loans. NID of the loan applicant and NID of the verbal guarantor are also taken for small loans. For business owners, MFIs sometimes ask for the trade license, rent/ownership contract of the shop and utility bills.	Risk appetite to finance: MFIs have products targeted to agri-business owners but not specifically for agri-machinery financing. However, MFIs do finance this machinery since there is no upper limit of disbursement fixed by MRA. Costs of service delivery: The MFIs disburse funds through their dedicated branches. Even before funds are disbursed, the field officers visit the business premises for assessment. Therefore, for MFIs, the human resource cost is the major cost head.	Recovery mechanism and costs: MFIs visit to collect loan repayments by visiting the business premises or owner's home. At enterprise level, MFIs have reported near to 100% recovery for agri-loan, including any fund that users had used for purchasing agr-machinery. Some MFIs are exploring partnerships with MFS for loan collection.

Table 28: Financing enterprise level player: Foundries, Workshops & Dealers

Financing Individual Level Players

Machinery Service Providers (MSPs)

Pre-lending (Application)	Lending (Loan Processing)	Post-lending (Repayment)
Banks and NBFI		
Business model viability: Although the loan size varies for SMEs, MSMEs, and dealers, the credit worthiness of MSPs are assessed in a similar way. MSPs often do not have proper financial documentation and often they do not use the banking system. As a result, it is difficult to assess the state of the business. In agri-loan, banks have historically taken greater exposure in the dairy and poultry sectors than in the machinery sector. Banks typically consider business financials, assets in the business and previous experience while giving loans. Payment vouchers are also checked as many MSPs do not maintain a balance sheet.	Risk appetite to finance: Agri-machinery specific financing is considered to be riskier than other agri-loans since a machine is a movable object and it can be easily sold as well. Banks/NBFIs do not have enough manpower to monitor this closely. Since the income of this group is seasonal, and banks take EMI, MSPs often fail to repay on time. Most banks have financed farmers based on their other businesses. For banks, collateral is a key issue and most of these farmers do not have enough assets such as land to offer as collateral. While SME loans are non-collateral in nature, the loan ticket size for agri-machinery financing is higher than usual agri-loans, and with only hypothecation of the machines, it is not enough collateral to cushion against default. However, some NBFIs offer unsecured loans if the value of the loan is less than BDT 1 Crore but they have not ventured into this group due to their lack of information regarding the business prospects of this category. However, if these MSPs applied for both machine purchase and working capital	Recovery mechanism and costs: Banks and NBFIs do not expect MSPs to visit branches regularly to make payments and they cannot even keep the machines as collateral (except for tractors which can be registered). Since a machine is a movable object and it can be easily sold. Banks/NBFIs do not have enough manpower to monitor this closely. Moreover, for the more expensive subsidy-based machines, ownership cannot be transferred to banks since they are owned by GoB so even if they were taken as collateral, banks would not be able to sell the machines to recoup the loan amount. In addition, due to improper usage by machine operators the machine resale value is often much lower than the purchase price of a new machine. Since the seasons when the machines can operate and earn income are short and difficulties with operating on small and fragmented land holdings MSPs can find it difficult to generate enough income to keep to the loan repayment schedules.

	loans, it might be easier for banks/NBFIs to understand their cash flow. Costs of service delivery: The banks are mandated by the Central Bank to disburse agri-loans. However, reaching out to rural areas requires the establishment of branches. For this reason banks have established agent banking systems. As loan approvals take place at the bank head office which is a time-consuming agent banks have not been fully utilized in the agricultural machinery sector. According to some sources the agent banking model is incurring losses. Some banks have tried the BDT 10 account for farmers but have not been able to attract farmers. Banks (with less than 500 branches) create links with MFIs to disburse the agri-loan. This saves the bank costs of sending manpower to collect EMIs from the end borrowers of MFIs.	
MFI		
Business model viability: MFIs finance MSPs on their income generating activities. These borrowers often have an existing loan with MFI and machine related loans are secondary loans for them. Just like the enterprise level players, MSPs are assessed on their income generating activities. Some MFIs arrange a collaborative system whereby	Risk appetite to finance: MFIs have products targeted to agri-business owners but not specifically for agri-machinery financing. However, MFIs do finance agricultural machinery since there is no upper limit of disbursement fixed by MRA. Since they do not take collateral, issues such as ownership transfer of machines are not important for	Recovery mechanism and costs: MFIs have field force to recover loans from these farmers which is one of the major operating costs. Some MFIs have reported that the recovery rate of agri-machinery loans is around 20% lower than other agri-loans. Moreover, since there is no CIB for MFIs, it is difficult to track their credit history. In cases

sales agents from other companies can come and talk to MFI's client base. If the clients want to purchase the machines, they can come to MFIs for the financing. MFIs then do the repayment capacity analysis to decide on approving the loan.	MFIs. In fact, some MFIs arrange partnership with machine importers to promote machines to the client/member base of MFIs which are then financed by the MFIs Costs of service delivery: Same as the enterprise level loans, the MFIs disburse funds through their dedicated branches. Even before funds are disbursed, the field officers visit the business premises for assessment. For this group, MFIs also undertake financial literacy training. Therefore, for MFIs, the human resource cost is the major cost head.	of partnership models with importers, MFIs face the challenge of failed repayments due to machine breakdown and the borrowers hold the importers accountable for after-sales service.

Table 29:Financing individual level players: MSPs

Comparison of MFI and Banks/NBFI for MSP Financing

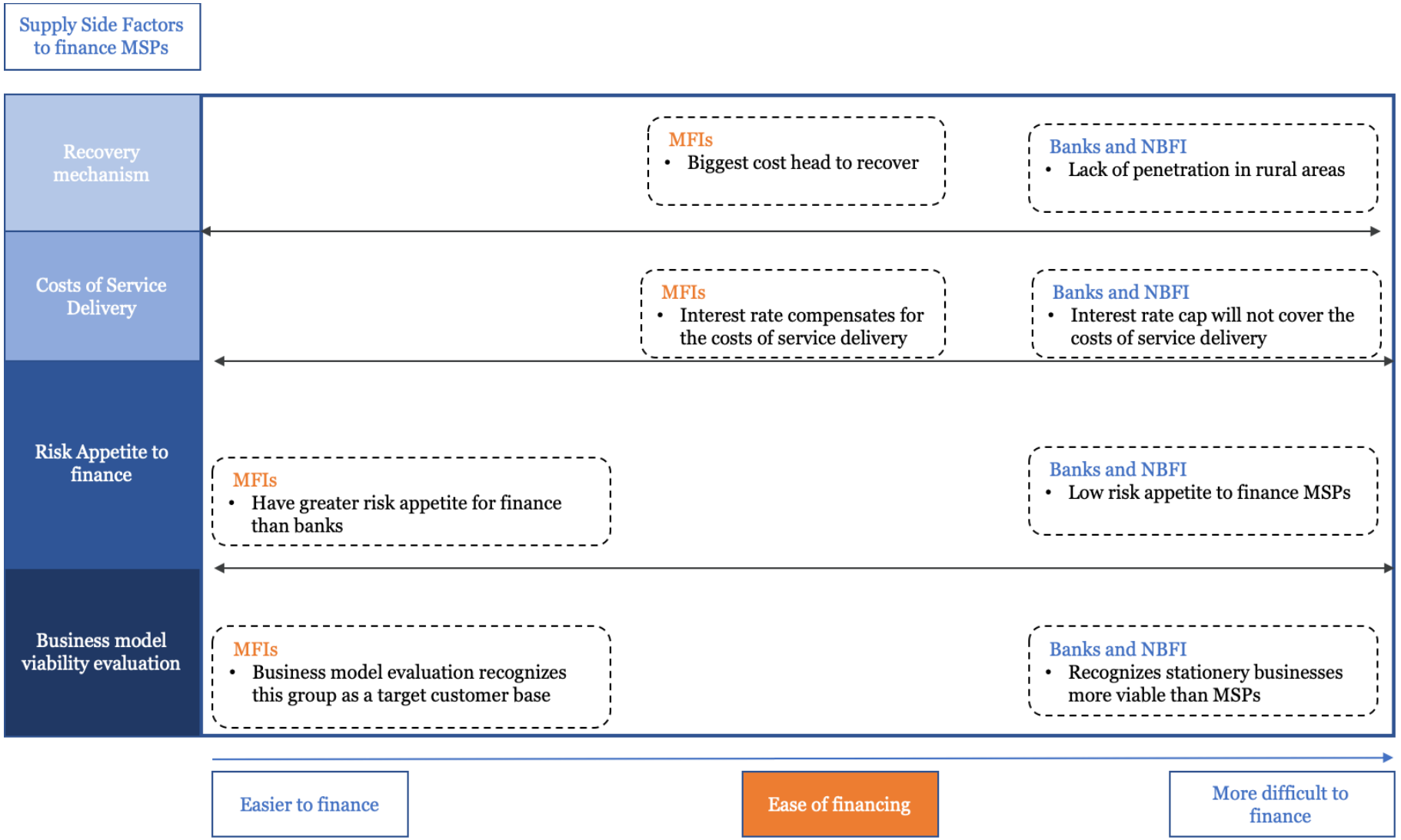


Figure 55: Comparison of MFIs and banks/NBFIs financing mechanism

4.4. Key Success Factors to Develop Innovative Financing Solutions

Thematic Areas	Relevant Stakeholders		
Awareness of the attractiveness of the agri-machinery market and the need to develop a market for used machinery: Financial institutions are not aware of how much income modern agricultural machinery can make, how many users of these machines there are now and the prospects for expansion of this market. At the same time, a market for the sale of repurposed machines in case of default has not yet been developed. Moreover, the machine resale value is low.	Importers	SME, MSME, Dealer	MSPs
Cushion for default in terms of buying back the machines, providing any guarantee scheme to complement the risk profile of stakeholders: One of the key considerations for financial institutions (FIs) is collateral which allows for the recovery of loans in case of loan default. As the agricultural machinery manufacturing and service provision sector are often unable to provide acceptable forms of collateral, already have a poor loan repayment record and fail to demonstrate the to the FI the viability of their businesses, FIs take a high risk when lending to these groups (except when they lend for the purchase of tractors). For MFIs, although loans are non-collateralized, poor recovery hampers their credit rating and creates fund shortage for reinvestment at the year end.	Importers	SME, MSME, Dealer	MSPs
FIs opt for less expensive channel for disbursement and collection from remote areas: Unlike MFIs, banks and NBFI do not take the community approach (human resources required) to reach rural areas for checking business prospects and guarantors before disbursement of loans. The costs of setting up new branches and maintaining human resources is a huge cost for banks/NBFIs to penetrate remote areas. Although MFIs are partnering with mobile financial services (MFS) for loan repayment through digital wallets this also involves some human intervention. As the central bank has ruled out any additional charges, for banks the challenge will be to incorporate transaction charges if they want to explore agri-loan disbursement through MFS.	Importers	SME, MSME, Dealer	MSPs
Create digital traceability of machines and the credit history of stakeholders: The machines are movable objects and they provide service in different regions unlike fixed establishments like dairy/rice mills etc. Installing trackers in machines by the importers can give them unique IDs, like registration numbers, for FIs to be able to track machines. Moreover, development of CIB for MFI based loans can help banks/NBFIs to cross-check credit history of small players who are reliant on MFI financing.	Importers	SME, MSME, Dealer	MSPs

Table 30: Key success factors & relevant stakeholders to develop innovative financing solutions
Note: Blue highlighted boxes are the relevant stakeholders for each thematic areas

Chapter 5: Ecosystem Analysis

5.1. Ecosystem Landscape

Ecosystem Builders and their Roles

Ecosystem builders are entities that regulate and lead a certain business landscape in order for its operation to be structured. The tables below are split into two kinds of ecosystem builders: Policy makers and associations along with development agencies.

Ecosystem Builders	Roles	Related Policies
Bangladesh Bank	The central bank and the regulatory body of all financial institutions. They are the implementing organization responsible for setting monetary policy of different sectors that drive the economy.	*Agricultural and Rural Credit Policy* • The central bank plans to disburse 28,391 Crore BDT of fund in the sector with local and foreign banks needing to accumulate 2.1% of their portfolio in agri-loans out of which 60% has to be crop based. • Crop hypothecation up to 5 acres of land • Loan to MFIs at an interest cap of 8% • Banks are encouraged to provide loans for agri-machinery with long-term maturity *Credit Guarantee Scheme (CGS)* • CGS unit claim 30% of the any default while the rest falls on FIs • Investment guarantee coverage ratio by CGS unit will be a maximum of 80% of the portfolio • Collaterals are not listed in the required documents for CMSME investment loan *Entrepreneurship Support Fund* • Agro-based projects costing from 0.8 to 5 crore BDT will receive the fund. Machinery intensive businesses will receive a maximum of 12 crore BDT.

		• 49% coverage provided at 2% simple interest for a tenure/repayment period of 8 years. • Businesses must be new and have a ROE of 15%. *Credit Risk Grading* • Leverage, Liquidity, Profitability and coverage is assessed to determine Financial Risk score, which weighs 50% weight in determining Credit Risk Score • Business /industry risk is 18% • Security/Collateral is only 10% • Management risk 12% • Relationship risk 10%
Micro-credit Regulatory Authority	They are the regulatory body of NGO-MFIs with an aim to ensure transparency and accountability of micro-credit activities in the country.	*MRA Guidelines for MFIs* • A cap of 24% interest is set for micro-credit disbursement by MFIs • Floor for the deposit rate is set at 6% • Minimum gap of 15 days between loan disbursement and start of recovery
Government of Bangladesh	Implement fiscal policies and subsidies that will help foster the agri-mechanization sector.	*Agri-Mechanization Policy* • Selection of appropriate agricultural machinery and marketing • FIs and NGOs should provide loans for agri-machinery • Ensuring technical support for extension of agri-machinery • Skill development and creation of MSPs

Table 31: Ecosystem builders, roles and related policies

Ecosystem Builders	Roles	Initiatives Taken
Bangladesh Engineering Industry Owners Association	To cluster and support engineering enterprises under an umbrella and serve as a sense of community leader among the enterprises	• Industrial long-term loans with low interest rates • Building capacity in terms of skills to operate, fix and manufacture machinery • Steps to get access to funds like venture capital and public equity

Development Agencies	To connect and serve the underprivileged population with products catered to their needs that will enhance their standard of living.	• Identify challenges faced in getting access to finance and disseminate it on a national level to encourage policy change and change in adaptability among multiple stakeholders. • Suggest development of modified products to financial institutions that will ensure financial for all beneficiaries including the most disadvantaged.

Table 32: Ecosystem builders, roles and initiatives taken

Challenges and Solutions Identified by Ecosystem Builders

The challenges and solutions were collected from Key Informant Interviews of ecosystem builders. For all the challenges identified, certain solutions that address a systemic change, and/or a policy level change have been identified.

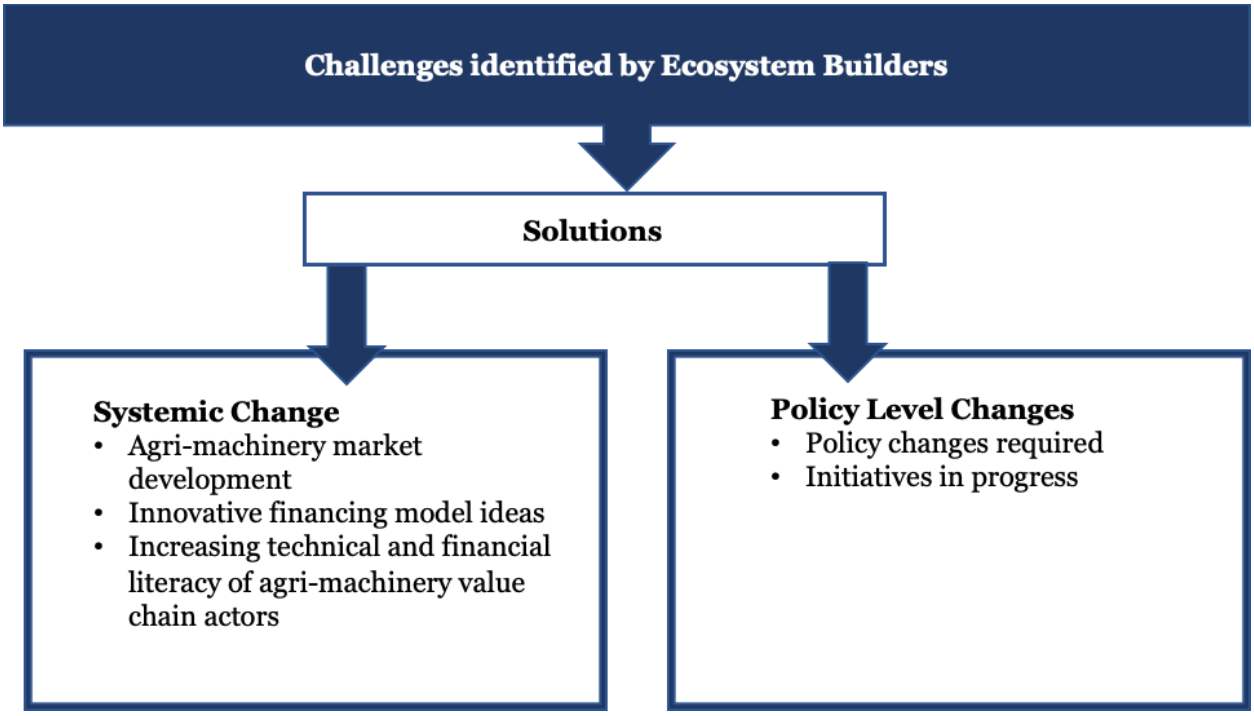


Figure 56: Challenges and solutions identified by ecosystem builders

Systemic Change

Agri-Machinery Market Development

One of the major barriers to finance agri-machinery value chain actors is the absence of data such as credit history, business financials, income records and utilization levels that will help financiers assess the prospects of the business, particularly for MSPs. Formal financial institutions are not fully aware of the risk-return profile from this business model of MSPs. Within 2-3 years it is considered development agencies could play a role by presenting to banks data that shows how access to agri-mechanization increased the demand by farmers. In this regard, talking to agri-mechanization companies like ACI, Metal, Abedin, Alim. This will show that more people are becoming MSPs, and farmers are using the services. There are a few independent companies who tried to bring these MSPs on a platform so that they can structure the service provided. So that there are data points showing how many MSPs are providing services to how many farmers and generating how much revenue. They wanted to create a business model. These data could be provided to banks to address the financing needs of the MSPs. Moreover, this might convince the banks to change their usual SME financing products where the EMI system is not suitable for MSPs whose earnings are seasonal.

In addition to the primary market, there needs to be a secondary market for reselling these machines. A lot of MSPs go out of business because machines break down and they cannot get access to spare parts. This is particularly true in case of new machines in the market. Moreover, the foundries and metalworking manufacturers still use old technology which, if upgraded, can help solve the problem of spare parts. In addition, industrial parks can be allocated for SMEs and MSMEs at a subsidized land cost. Engineering workshops in our country mostly operate on rental lands and older machinery. Thus, do not have collateral to put up for loans.

Innovative Financing Model Ideas

An MSP with a certificate can obtain a subsidy from the GoB and they can approach the machine manufacturing company to purchase the machine. If the MSP does not have the ability to pay the down-payment, then the company could connect them with their respective banking partner. MSPs will not have to deal with the bank as the manufacturing company will get the money instantly from the bank. This partnership will increase mechanization. However, the field force of machinery companies can help recover the banks loans since they are always in touch with these value chain actors. Meanwhile, banks can use the trackers used by some manufacturers to pull data on earnings, location etc.

Similarly, there can be grant loans from donors such as USAID. However, this will require the Bangladesh Bank and Ministry of Finance to approach for channeling funds through guaranteed schemes. A credit guarantee scheme is where a third party mitigates a portion of the credit risk borne by the lender through absorbing a certain amount of lender's losses in case of a default. Such arrangements can enable FIs to grant loans to a wider audience of people. But this process has a lot of administrative burden. Some banks and MFIs were also interested in accessing a guaranteed scheme from donors/NGOs which can assist these financiers to provide loans on a flexible term. Another possible source could be venture capital, private equity that will finance these value chain actors.

Technical and Financial Literacy of Agri-Machinery Value Chain Actors

At root level, there has to be capacity building training in terms of skills to operate, fix and manufacture machinery. Similarly, MSPs must be correctly taught the daily maintenance of machines and help them to follow the machine usage guidelines such as maximum operating hours per day, depth of land to tread on, etc. Moreover, financial literacy of MSPs is a key barrier to access to finance. MSPs require support in understanding how much revenue they can generate from the machine and how the costs can be monitored. Most MSPs try to overuse the machines during peak season since they are burdened to earn more to repay

Policy Level Changes

Policy Changes Required and Initiative in Progress

According to the manufacturers' association, agri industry, they need "industrial loans" which are long term loans (10-15 years) with low rates of interest (<5%). In addition, allowing registration

of agri-machinery just like tractors will make agri-machinery more lucrative for financing. The registration will allow a unique identification to these machines so that they can be tracked in a database. In addition, one of the major changes required will be advocating the GoB to allow ownership transfer to banks before 3 years in case of subsidy-based machines. Meanwhile, MRA is in the process of developing CIB for MFIs in collaboration with Bangladesh Bank which will help the MFIs track the credit history of their members.

Chapter 6: Strategic Recommendations

6.1 Summary of Findings

The study has looked at the pain points of both the supply side and demand side, alongside identified the systemic level or policy level changes required to increase access to finance for agri-machinery value chain actors. Through the similar framework of lending stages, the LCP team has evaluated the factors that drive both the supply and demand side, consequently pointing towards the mismatch in supply and demand side in the business ecosystem as outlined in the next page.

Demand and Supply Gap	Relevant Stakeholders		
Establishing business model vs Evaluating viability of business model : The major gap lies in establishing the business viability of value chain actors (highlighted on the right) to banks and NBFIs. Absence of record keeping proves to be major barrier in proving the income generating activities for the small players. However, MFIs tend to finance the small players (SMEs and mostly MSPs) more than banks do under their agri-loan products and most borrowers take machinery loan as a secondary loan.	Importers	SME, MSME, Dealer	MSPs
Risk appetite for finance vs Risk appetite to finance: Banks or NBFIs are not involved in the hire purchase schemes provided by importers since there has been experiences of poor recovery. The same is true of the light engineering sector in general including SME, MSME and dealers. Particularly, MSPs are not considered to be creditworthy by most banks and NBFIs and their existing products (SME loan) does not take into account the seasonality impact since MSPs lose touch with the banking system when the peak season recurs after off –peak. Meanwhile, partnerships with machinery importers had been explored by banks and MFIs but have had poor recovery experience which makes them skeptical unless some assurance is provided for recovery.	Importers	SME, MSME, Dealer	MSPs
Costs of service access vs Costs of service delivery : Providing service to small players is expensive for banks/NBFIs since the risk profile of these players, along with fixed cost of branch operations, do not justify the interest cap of 9%. Banks/NBFIs do not have enough human resource to cater to small players. However, given the 24% interest rate of MFIs, this compensates for the service delivery where human resource is the major cost head. On the other hand, small players are prone to accessing credit from sources with low or minimal cost (avoiding documentation related charges)and quick processing time.	Importers	SME, MSME, Dealer	MSPs
Repayment capacity vs Recovery mechanism and costs: Partnerships with importers had been explored by banks and MFIs but poor recovery experience from MSPs makes them skeptical unless some assurance is provided for recovery. The FIs cannot afford assigning human resource for physical collection of loan like the MFIs do. Since the machines cannot be taken as collateral nor can the ownership be transferred to banks in case of subsidy based machines, the FIs are skeptical to lend to value chain actors (highlighted on the right). On the other hand, value chain actors struggle to make timely payments due to business seasonality impacts which are not considered in the credit products.	Importers	SME, MSME, Dealer	MSPs

Table 33: Demand supply gap & relevant stakeholders
Note: Blue highlighted boxes are the relevant stakeholders for each gap

Strategic Pillars

Based on the findings outlined above, the LCP team has identified three strategic pillars that will guide the formulation of the alternative financing models.

Pillar I: Guarantee of recovery

The alternative financing models will hinge on providing a mechanism to allow the lenders some guarantee or assurance for recovery of loans. Since farmers and/or small businesses struggle to provide collateral and often fail to make timely repayments, the lenders are sceptical of designing products targeted at this group of actors, particularly the MSPs more so than the ABLE SMEs/MSMEs or even the dealers. While importers are the strongest link in the value chain in terms of accessing finance, the weakest link is the small businesses, and particularly the MSPs, who seem to be crowded out from the formal financing landscape. Therefore, it becomes imperative that the recommendations consider that lenders will be given assurance of recovery through another mechanism for value chain actors who do not have sufficient land or property to offer as collateral.

Pillar II: Advocating policy level changes

Whilst the GoB has taken great initiatives to popularize agri-machinery such as introducing subsidies for machines such as Combine Harvesters to make it more affordable for value chain actors, some specific policy level changes can make the suggested financing models work better for all the value chain actors. To this end, for the financing models to work, ownership transfer for the subsidy-based machines are essential to allow reselling in the secondary market, which will benefit all the value chain actors alike. Meanwhile, if banks could charge interest at a simple rate rather than compounding rate, it will be beneficial for the value chain actors too since the burden of repayment will be lower than that of compound interest rate method. In this case, the central bank could allow a mandate to charge a simple interest rate when financing agri-machinery. Moreover, particularly for the importers, the government may provide import incentives, such as lower import duty, to make the hire purchase selling models of importers more profitable since they can pass on the benefits of lower import duty in the form of lower purchase price to end-buyers.

Pillar III: Technical and financial literacy training of value chain actors

For the financing models to work, the demand side actors should also be made 'finance-ready' for increasing their access to credit products. To this end, financial literacy in terms of record keeping and being able to correctly calculate the business financing needs

can improve the chances of acquiring formal loans for ABLE SMEs, ABLE MSMEs, MSPs and dealers. Also, these value chain actors could be given support in understanding the documentation related needs which would eventually be incorporated into their business practice of maintaining relevant documents for loan approval. This will be crucial for the value chain actors to prove their business model and their repayment capacity. Additionally, for the agri-machinery market to develop, the literacy of the value chain actors in terms of machine operation and daily maintenance must be monitored. This is mostly applicable for the end users, particularly MSPs and farmers, because proper machine usage and maintenance is of utmost significance to increase machine resale value by 50% in the secondary market. This will help develop a secondary market for the agri-machinery that can boost confidence among the financiers that the machines can be resold to recover the loan amount in case of default.

6.2. Financing Model for Agricultural Machinery Market

Alternative Financing Model

Model 1

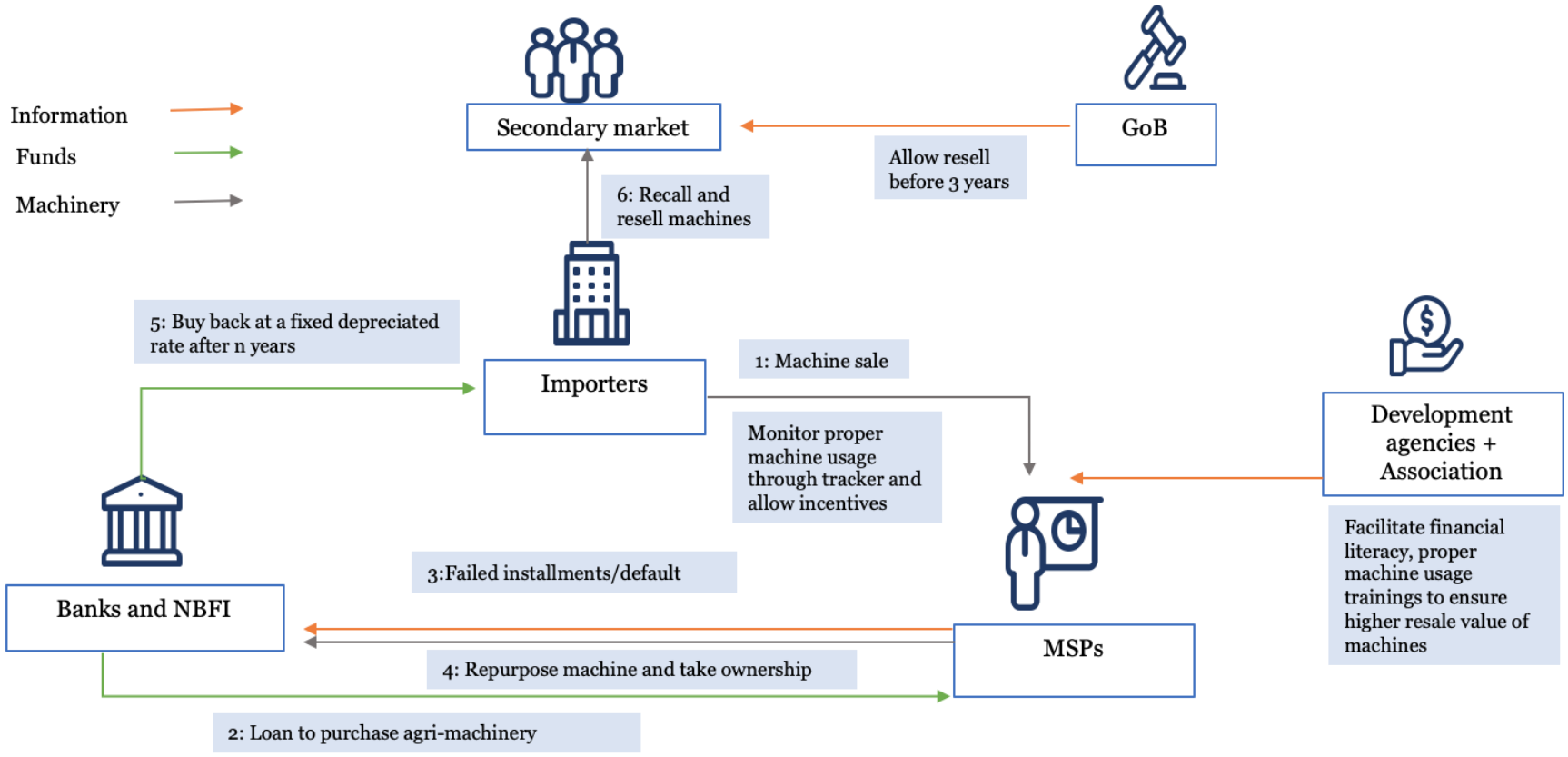


Figure 57: Alternative financing model: Model 1

How the model works:

The model description in terms of the different numbered stages, according to the figure above, is as follows:

1. The machines are sold to MSPs by importers who will connect the MSPs to banks for acquiring loans to finance the machine purchase.

2. Banks will provide the loans under the condition that if the MSPs default, the importers will buy back at the fixed depreciated rate such as 10% after 1 year, 20% after 2 years etc.

3. In case the MSPs default in paying the loans even after proper monitoring by banks, the bank's recourse will be selling off the collateral to recover the amount. Since MSPs often cannot provide land as collateral, FIs will need an alternative recourse.

4. In this case, banks will have to repossess the machines and take ownership to sell them to the importers.

5. The repossessed machines will be bought back by the importers at the predetermined depreciated rate while the loan was offered to the borrowers. The importers would then sell the machines in the secondary market. While there are no restrictions on non-subsidised machines, the subsidy-based machines cannot be recalled and resold before 3 years. In this case, there should be policy level advocacy to remove the clause of ownership by GoB before 3 years. However, even if the GoB does not remove the clause, the banks can finance only with a 36 month tenor so that the full period of GoB ownership is covered.

6. Meanwhile, for this mechanism to work, there has to be a secondary market and the machines (average lifetime of 5 years) must be used in the correct manner to ensure good resale value. Proper daily maintenance can increase resale value upto 50%. Since most farmers get 45 to 50 days in one season, they overuse the machine to earn more. In this case, importers can allow some incentives regarding after sales service based on reports collected from their tracker installed in machines. Installment of trackers allows monitoring by importers, and they must be allowed to recall the machines if a certain threshold is crossed. In this case, development agencies can partner with FIs to provide financial literacy content on bookkeeping, fund raising, and financial management courses on youtube channels particularly for SMEs and MSPs. Some FIs have e-learning platforms which can be leveraged by the MSMEs for self-learning. Moreover, FIs can have dedicated desks for loan related help in their call centers for loan related knowledge dissemination. Meanwhile, associations can play a role in imparting machine maintenance related training.

Stakeholder	Incentives	Risks and Mitigations
Banks/NBFI	Guarantee for default since machines are non-collateralized in nature and also that banks disburse SME loans (upto certain limits such as BDT 8 lac to 50 lac) which are non-collateralized in nature.	In case, GoB does not allow reselling before 3 years then banks may have to face NPL (bad loan). Since importers have to buy back in case of default, they can use their salesforce to help banks in recovery of loans.
Importer	By providing banks with a guarantee, importers can increase the bank/NBFI' risk appetite to finance the end users such as MSPs and farmers.	The MSPs will have to properly use the machines for importers to get high resale value. Importers can allow incentives in terms of after sales service and submit monitoring reports to banks too.
MSPs	Enhanced financial literacy and record keeping can increase access to finance. Daily proper maintenance can make them earn incentives from importers.	Failure to repay will lead to recall of machinery and they will go out of business.
GoB	Allowing recall and resell at least after 1 year, if not right on time of sale, can help popularize these machines in the market.	If resale is allowed there could be more demand for machines in the market and the GoB has to increase budget for procurement in the long run.

Table 34: Stakeholders, incentives, risk & mitigation: Model 1

Model 2

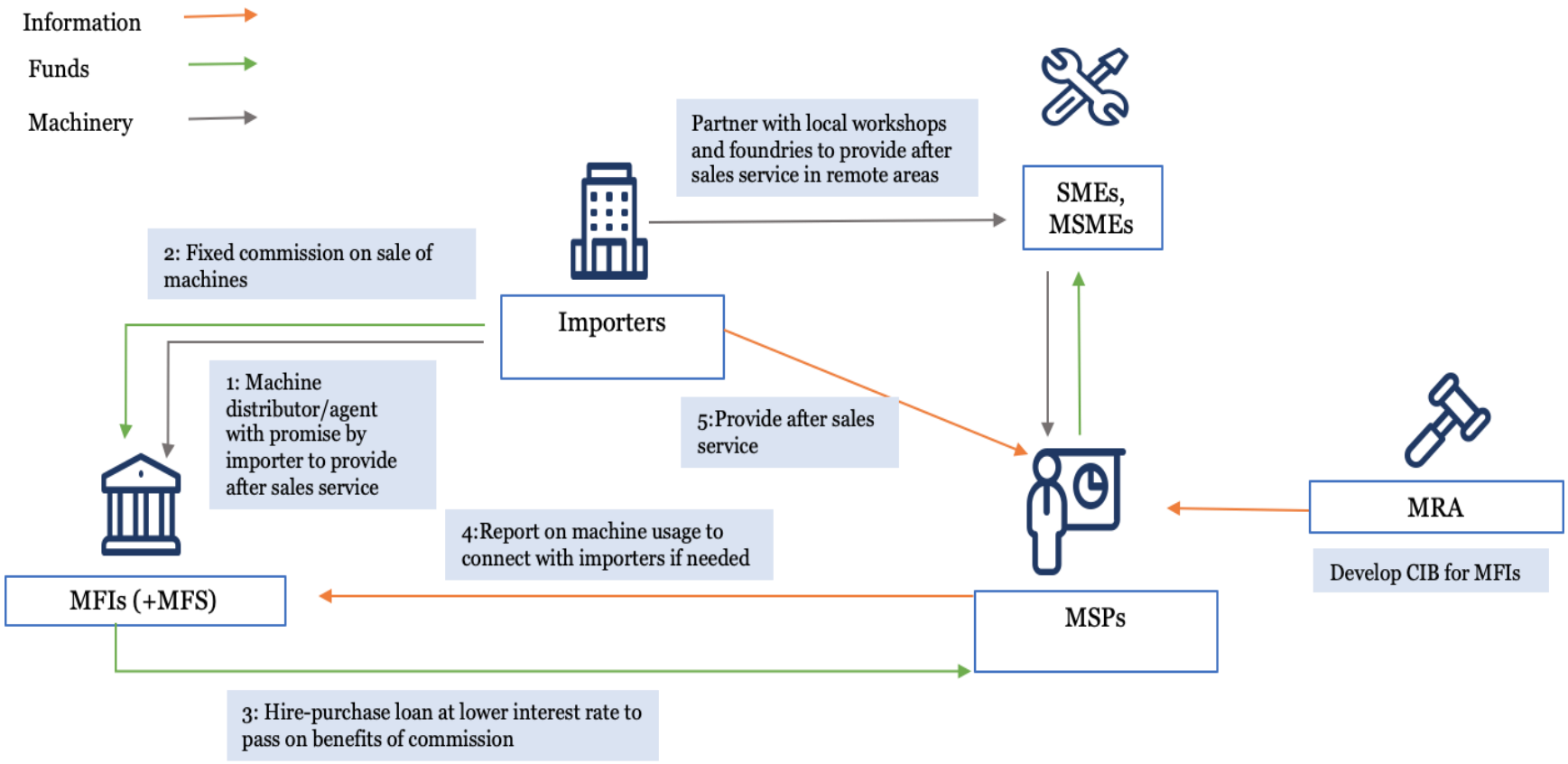


Figure 58: Alternative financing model: Model 2

How the model works:

The model description in terms of the different numbered stages, according to the figure above, is as follows:

1. MFIs will take a dual role in this model both as a financier and a distributor of the machines. Importers will partner with MFIs as their distribution channel while the importers will guarantee providing after sales service to the buyers directly.

2. Importers will pay a fixed commission to the MFIs on the sale of machines, which will also be partly financed by the MFIs through a hire-purchase agreement with borrowers.

3. MFIs can pass on the benefits of the commission earned to the MSPs by providing a lower interest rate, since MFIs now have another revenue source in the form of commission to cover their operational costs.

4. The borrowers can provide regular machine usage reports to MFIs which will ensure that the borrowers are held accountable for proper machine maintenance. Proper machine maintenance is not only necessary to uplift their resale value but oftentimes these borrowers stop repayment once the machines break down and they fail to avail after sales service.

5. In this model, the importers will have to take on the responsibility of after sales service. Since importers may not have adequate sales force to service at more frequent intervals, they can partner with local workshops and foundries to provide after sales service through web-based platforms such as 'Jantrik'. Some ABLE SMEs and MSMEs, dealers also have youtube channels for order maintenance so they can be easily upgraded to web-based platforms to provide after-sales service. This system will also allow them to upgrade their technology to match the new technology in the agri-machinery landscape and make them more relevant in the market. This will encourage banks/NBFIs to finance the SMEs and MSMEs more since they are integrated within a system where they have support from large importers and their end users (MSPs) have increased access to collateral free finance.

Meanwhile, the MRA will have to work on providing CIB for MFI based borrowers too to ensure loan tracking and good credit behavior which will further encourage the MFIs to operate in this model for agri-machinery. As the MFIs do not take collateral, CIB will help to track borrowers, as the CIB reports can be connected with smart cards for farmers that will be launched by the GoB.

Stakeholder	Incentives	Risks and Mitigations
MFIs	Earn commission which can contribute to operating expenses and also not be burdened with after sales service.	Lower interest may be a barrier but if the commission is negotiated to keep a profit spread, this will prove beneficial for all actors in the model.
MFS	MFS channels are currently used to collect instalments. If the same can be used for disbursement, it will be a greater source of revenue for MFS. However, with banks, the transaction fee is a barrier since the central bank does not allow any additional charge to be taken for agri-loans.	As the MSPs mostly rely on MFI loans, the traceability of MSPs is an issue which will be resolved if the CIB report is developed by MRA.
Importer	Greater sales of products and support from local industry to ensure repeat sales. Since MFIs do not take collateral, it is relatively easier to finance MSPs than conventional FIs.	This will mean cutting out on usual dealer channels. However, dealers usually keep more spare parts than whole machines in their portfolio. Hence, they can be leveraged for after sales service too.
MSP	Receiving loan at a lower interest rate than before with greater network of after sales service.	Failure of machine maintenance will have to be reported to MFIs.
SMEs and MSMEs	Greater sales in terms of components for machines that are being subsidized by the GoB. Currently, these foundries are working with importers to manufacture spare parts of machines and they can expand to relatively new machines such as combine harvester, reaper, rice transplanters.	Invest in improving technological upgradation to match the quality of importers.

Table 35: Stakeholders, incentives, risk & mitigation: Model 2

Model 3

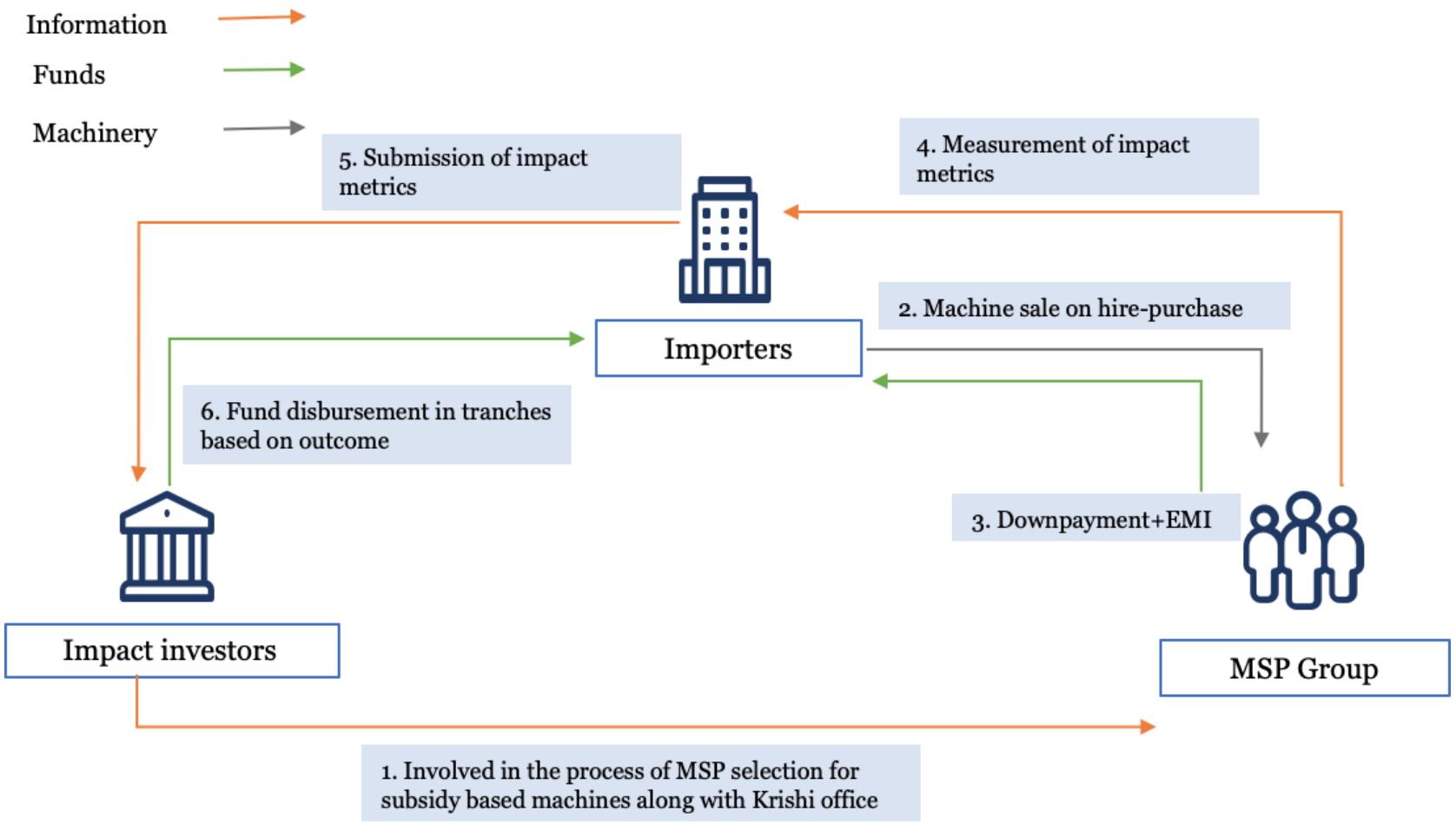


Figure 59: Alternative financing model: Model 3

How the model works:

The model description in terms of the different numbered stages, according to the figure above, is as follows:

1. This model will follow the SIINC (Social Impact Incentives) funding approach involving impact investors who provide funding in several tranches on successful achievement of the predetermined targets. The impact investors will be involved in the subsidy selection process for greater transparency in the process.

2. For this model to work, the importers will have to provide a social commitment by coming up with impact metrics while operating the same hire-purchase model. Such metrics could include Beneficiaries (farmer groups) show improved revenue generating capacity; number of farmer groups served etc by comparing it with a baseline study.

3. As the end buyers in groups (MSPs) pay the down payment and EMI for the hire-purchase, these will be recorded by the importers for preparation of impact metrics.

4. The importers will have to measure the impact metrics at regular intervals and quantify the aggregate impact, such as improved earnings or increased agri-mechanization, to become eligible for impact funding.

5. The impact metrics are then submitted to the impact investors who would then verify the impact using a third party to decide on the achievement of the impact.

6. Upon successful achievement of the impact metrics, the importers will receive funding from impact investors that can be used to finance the importers' hire purchase scheme.

Stakeholder	Incentives	Risks and Mitigations
Impact investors	According to LightCastle study of 100 impact investors, the most important parameters for impact investors are as follows: • 22% Project Outcome (Social and Environmental) • 15% Sustainability of impact This is in alignment with the goals of the project which aims to promote agri-mechanization by increasing access to finance. Another major finding from the LightCastle study is that in the future, priority sectors for the impact investors include consumer food (17%) which is linked to greater mechanization for increased food security.	The machines are relatively new and MSPs are not fully informed of the revenue generating capacity. Even if they do understand, there is minimal record keeping which might prove to be a barrier for correct impact measurement.
Importer	Since the hire purchase will be availed by a group of MSPs, they can act as verbal guarantor for each other. Meanwhile, with impact investment, importers can be assured of funding on meeting the impact targets	There is minimal record keeping which might prove to be a barrier for correct impact measurement.

Table 36: Stakeholders, incentives, risk & mitigation: Model 3

Model Number	Challenges/Gaps addressed	Relevant stakeholders	Recommendations (Action Points)
Model 1	• Difficulty in establishing business model viability by MSPs • Low risk appetite of FIs for financing MSPs • High costs of service delivery to MSPs • Difficulty in loan recovery from bank-importer partnership models • Low resale value of machines hampering the attractiveness of financing this sector • Replacement of collateral with guarantee from importers	*Credit Supplier*: Banks, NBFI *Credit User*: MSPs, Importer *Facilitator*: GoB, Development Agencies, Association	*GoB*: Allow reselling of subsidy-based machines before 3 years Importers: Agree to buy-back at depreciated rate and install trackers in machines *Banks/NBFI*: Lend for machinery purchase and repossess machines in case of default. Disseminate financial content through e-learning platforms and web-based platforms. *MSPs*: Attend trainings on machine maintenance and financial literacy and implement the learnings *Development agencies and associations*: Development agencies to partner up with FIs to provide financial literacy training, while associations can give machine related training, and documentation support from associations only.

Model 2	• High costs of service delivery to MSPs and SMEs (operational costs) • Difficulty in availing after-sales services in MFI-importer partnership models • High costs of service access (interest rate) from MFIs • Low resale value of machines • Lack of credit history for MFI-based borrowers	*Credit Supplier*: MFI, Importers *Credit User*: MSPs *Indirect Credit User*: SMEs and MSMEs *Facilitator*: MFS	*MFIs*: Act as financier and distributor by giving collateral free loans. *MFS*: Facilitate the MFI collection process Importers: Pays the MFIs a fixed commission and provides after sales service *SMEs and MSMEs*: Develop capabilities to provide after sales service *MSPs*: Accountable for proper machine maintenance
Model 3	• Low risk appetite of FIs for financing MSPs • High costs of service delivery to MSPs • Replacement of collateral with impact metrics from investors	*Credit Supplier*: Impact investor, Importers *Credit User*: MSP group	*Impact Investors*: Impact investors will provide funding in several tranches on successful achievement of the predetermined targets. *Importer*: Importers will have to provide a social commitment by coming up with impact metrics such as Beneficiaries (farmer groups) show improved revenue generating capacity etc. *MSP group*s: Ensure record keeping of financials

Table 37: Stakeholders, incentives, risk & mitigation: Summary

6.3. Action Points for the CSISA MEA Project

Action Points: Way Forward
Policy
• Since MSPs availing government subsidy are not legally allowed to sell their equipment within three years, formal lenders (e.g., Banks) are often discouraged to lend to MSPs, as banks are unable to repurpose the vehicle of the defaulter and resell them in the secondary market. A policy advocacy initiative for persuading the government to remove the 3-year moratorium for reselling of equipment would help open up the secondary market for farm equipment and facilitate more lending.
Operational
• CSISA-MEA can organise accelerator programs for ABLE SMEs, which would enable their founders to better operate their businesses, manage accounts, and secure loans from formal lenders. • A mobile lite ERP system can be developed and deployed for better managing accounts and finances for the ABLE SMEs. The partner banks can also benefit from more transparent financial data, leading to better trust within the system and more lending to these SMEs.
• A meet the partner event to be organised for connecting MFIs with machinery importers and manufacturers. The interested MFIs can become distributors and financiers for the equipment, leading to a 'win-win' situation for both the parties.
• Once partners between MFIs and machinery importers are established, training can be provided for equipment maintenance to employees of MFIs and mechanics within the intervention areas.
• In partnership with banks, an e-learning platform where contents will be uploaded in a separate app/website or a youtube channel. The courses of the program should incorporate bookkeeping, access to finance and financial management, fundraising from banks, and laws and regulations of a business.
• A toll-free number, in collaboration with partner banks, to be established for handling queries of MSPs, workshops and foundries. The call centre agent will help answer queries pertaining to bank financing for ABLE SMEs.

Conclusion

The study findings point to the fact that not all stakeholders across the agri-machinery value chain face the same degree of challenges in accessing finance. Mostly, the small players in the value chain, especially, MSPs are getting crowded out in terms of accessing finance. Therefore, there is a necessity to redesign financing solutions targeting this group since they are the end users of the

agri-machinery. Improving their access to finance will ultimately create a bottom-up effect to overcome the challenges of the other enterprise level players. This could come from devising alternative models that provide assurance of recovery of loans, policy level changes to ease the burden on financiers, and significant improvement in financial and technical literacy of the end users (MSPs). As the findings suggest, attempts to recover loans from value chain actors fall short due to seasonality of income and lack of adequate collateral. As such, the lenders are skeptical of designing products targeted at this group of actors, particularly the MSPs, since they are required to add some guarantee or assurance for recovery of loans. Going back to the study objectives, the LCP team did unearth the pain points of the agri-machinery value chain actors and the corresponding supply side pain points too.

Since the demand-supply gap exists, there has to be a collaborative approach from all stakeholders including regulators to help improve the financing status of the value chain actors. The CSISA-MEA project will play a significant role in bringing all the value chain actors from the demand and supply side actors, as well regulators on the same page to pave the road towards greater access to finance for the agri-machinery value chain actors in the long run. A multi-pronged approach considering the incentives and risks of each of the involved players must be considered. All financing products have risks, but the risks must be shared among the stakeholders to improve the financial status of the agri-machinery value chain actors to promote greater mechanization in the agriculture sector of the country.

GLOSSARY

Terms	Definitions
Agent Bank	A bank that performs its services in some capacity on behalf of an entity
Asset Management Company	A firm that invests pooled funds from clients, putting the capital to work through different investments including stocks, bonds, real estate and more
Ballooning Payment	A payment method where the installment size increases over time and becomes the highest during the end of the tenure.
Banks	Financial institutions licensed to receive deposits and give out loans. Banks also provide other services like wealth management and currency exchange.
CAPEX	The funds used by a company to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment.
CC Loan	A short-term loan approved by banks for businesses and companies to meet their working capital requirements.
CGS	A credit guarantee scheme provides third-party credit risk mitigation to lenders through the absorption of a portion of the lender's losses on loans within the scope of the scheme
CIB report	A report that provides information on the status of existing credit facility and repayment behavior of a customer even if he/she does not have any default credit.
Collateral	An asset pledged as security for the repayment of a loan
Corporate Guarantee	A legal agreement between a borrower, lender, and guarantor, whereby a corporation takes responsibility for the debt repayment of the borrower provided it faced bankruptcy.
Credit from supplier	A credit established by the supplier upon purchasing a product with the condition to pay the amount within a certain period of time.
CRG	A Credit Risk Grading is an important tool for credit risk management as it helps financial institutions to understand various dimensions of risk involved in different credit transactions.
Crowdfunding	The practice of funding a project or venture by raising money from a large number of people who each contribute a relatively small amount
Dealer	Sellers of machinery and spare parts and they may provide after-sales services such as the sale of spare parts and provide machinery maintenance and repair services until the warranty period ends. They can be exclusive and non-exclusive as well.

Debt Burden Ratio	Ratio of total monthly installment/commitments of credit card, loans or any other committed monthly repayments to the total income of an individual
Debt finance	It is the process of borrowing money from institutional lenders with the promise to pay back within a certain period of time.
Demand Promissory note	A promissory note is a debt instrument that contains a written promise by one party (the note's issuer or maker) to pay another party (the note's payee) a definite sum of money, either on-demand or at a specified future date.
DFS	Digital financial services (DFS) comprise a broad range of financial services accessed and delivered through digital channels that includes payments, credit, savings, remittances and insurance.
EMI	Equal installments paid on a monthly basis for a loan
EQI	Equal installments paid on a quarterly basis for a loan
Hire purchase	An arrangement for buying expensive consumer goods, where the buyer makes an initial down payment and pays the balance plus interest in installments. In this agreement, ownership is not transferred to the purchaser until all payments are made.
Joint Venture	A commercial enterprise undertaken jointly by two or more parties which otherwise retain their distinct identities
KYC	A process of identifying and verifying the client's identity when opening an account.
Letter of Credit (LCs)	A letter issued by a bank to another bank to serve as a guarantee for payments made to a specified person under specified conditions.
Letter of stock hypothecation	A written agreement which authorizes a bank or lender to repossess and sell the pledged item in case of a default
Manufacturer	They produce the machine parts, components and assemble the machine.
Microfinance Institutions (MFIs)	Organizations that provide loans to people who traditionally cannot access mainstream sources of finance from Banking institutions, e.g., low-income clients, small and micro enterprises and the self-employed.
MSP	Micro-entrepreneurs who sell machinery services to farmers. Often known as “Local Service Providers (LSPs)”
Non-Banking Financial Institutions (NBFIs)	Financial institutions that do not have a license to accept deposits from the public. They offer alternative financial services like mutual fund investments, brokering, financial consulting etc.

One-off Payment	A payment method where the entire loan amount is paid at once
Personal Guarantee	An individual's legal promise to repay credit.
Post-dated cheque	A cheque written by the payer for a future date
Private Equity	Private equity is an alternative investment class and consists of capital that is not listed on a public exchange
Refinancing	Finance (something) again, typically with new loans at a lower rate of interest
Retained Earnings	A portion of the company's profit that is held and saved for future use.
Risk Appetite	Risk appetite is the level of risk that an organisation is willing to accept while pursuing its objectives, and before any action is determined to be necessary in order to reduce the risk
SIINC Funding	An outcome-based impact financing model that disburses funding in different stages based on results
Term Loan	A loan from a bank for a specific amount that has a specified repayment schedule and a fixed or floating interest rate
Value Chain	A framework describing the full chain of a business's activities in the creation of a product or service
Venture Capital	Venture capital (VC) is a form of private equity and a type of financing that investors provide to startup companies and small businesses that are believed to have long-term growth potential
Wholesaler/Reseller/Retailer	They are enterprises who buy finished items from workshops in Bangladesh or import from overseas manufacturers and sell to end users either directly or through dealers.
Working capital	The capital required to meet day to day operation

Table 38: Glossary

Chapter 7: Annexure

Annex 1: List of Interviewees

Stakeholder Group	SL #	Name of Organization	Name of Interviewee	Designation of Interviewee	E-mail address of Interviewee
Private Commercial Banks	1	BRAC Bank	Saiful Islam	Head of Agriculture Finance	smsaiful.islam@bracbank.com
	2	City Bank	Md. Mahbubur Rahman	Head of Products, Small Business	mahbubur-rahman@thecitybank.com
	3	Shahjalal Islami Bank	Abdur Rahim	Head of Agri-Investment Division	rahim.sjibl@gmail.com
	4	Dhaka Bank	Katebur Rahman	Senior Vice President	katebur.rahman@dhakabank.com.bd
State Owned/Public Banks	5	Janata Bank	Md. Abdus Samad Khan	Deputy General Manager	rcd@janatabank-bd.com
	6	Sonali Bank	Md. Shah Alam	Deputy General Manager	miazi12369@gmail.com
Non-Banking Financial Institution	7	IDLC	Mehedi Hasan	Regional Credit Manager	hmmehedi@idlc.com
Digital Financial Service	8	bKash	Masrur Chowdhury	EVP & Head of Government Projects & Business Sales	masrur.chowdhury@bkash.com
Agent Bank	9	Bank Asia	Samiul Anam	AVP, Head of CMSE Business, Channel Banking, Agent Banking Division	samiul.anam@bankasia-bd.com
Micro-Finance Institution	10	BRAC	Sahed Azad	Chief Operating Officer	sahed.azad@brac.net
	11	Padakhep	Risalat Siddique	Director	risalat@padakhep.org
	12	Sajida Foundation	Akhter Hamed	Chief Operating Officer	akhter.hamed@sajida.org
Bank Regulator	13	Bangladesh Bank	Shahid Reza	Deputy Director	shahid.reza@bb.org.bd

Micro-credit Regulator	14	MRA	Md. Yakub Hossain	Director	director.presearch@mra.gov.bd
Manufacturers Association	15	BEIOA	Md Masum	Office Consultant	beioa2008@gmail.com
Development Agencies	16	ACDI VOCA	Bidowra Khan	Regional Gender & Inclusive Development Advisor	bkhan@acdivocardc.org
Manufacturers & Importers	17	Janata	Md. Ole Ullah	Founder	janataengineering786@gmail.com
	18	The Metal	Abul Kashem	Advisor	abul.kashem@metalbd.biz
	19	ACI	Humayun Kabir	Senior Product Executive	h.kabir@aci-bd.com
	20	Alim	Engr. Md. Humayun Kabir	General Manager	humayun@alim.com.bd

Annex 2: Data Collection Pictures