

SEMI-ANNUAL REPORT (OCTOBER 2021-MARCH 2022)

Cereal Systems Initiative for South Asia- Mechanization and Extension Activity
(CSISA-MEA)





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Acronyms and abbreviations

ABLE	agriculture-based light engineering
ADO	Agriculture Development Officer
AFP	axial flow pump
ASA	Association for Social Advancement
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BCSIR	Bangladesh Council of Scientific and Industrial Research
BDO	Business Development Officer
BEIOA	Bangladesh Light Engineering Owners Association
BITAC	Bangladesh Industrial and Technical Assistance Center
BRAC	Bangladesh Rural Advancement Committee
CSISA–MEA	Cereal Systems Initiative in South Asia – Mechanization Extension Activity
CSISA–MI	Cereal Systems Initiative in South Asia - Mechanization and Irrigation
CA	conservation agriculture
CAD	computer-aided design
CIMMYT	The International Maize and Wheat Improvement Center
CNC	computer numerical control
CXB	Cox's Bazar
DAE	Department of Agriculture Extension
DFI	Development Finance Institutions
FAO	Food and Agriculture Organization
FBA	Farm Business Advisor
FFD	Farmer Field Day
FSI	financial services institution
HAO	Humanitarian Assistance Officer
HYV	high yield variety
iDE	International Development Enterprise
IDLC	Industrial Development Leasing Company
iDQA	Internal Data Quality Assessment
INGO	international non-governmental organization
IPDC	Industrial Promotion and Development Company
IT	information technology
JCF	Jagoroni Chakra Foundation
JVA	joint venture agreement
KMP	<i>Krishi Machine Porichiti</i> (Introduction to Agricultural Machines)
LE	light engineering
LLA	local level agreement
LSP	local service provider
LPIN	Livestock Production for Improved Nutrition



MFI	micro finance institution
MCH	medium combine harvester
MEL	monitoring, evaluation and learning
MDO	Mechanization Development Officer
MSA	market system analysis
MSME	micro, small and medium enterprises
MSP	machinery solution provider
NGO	non-governmental organization
NRE	New Rifat Engineering
PPE	personal protective equipment
PTOS	power tiller-operated seeder
PRQ	premium quality rice
RDC	Rice and Diversified Crops Activity
RRF	Rural Reconstruction Foundation
RT	rice transplanter
SAAO	Sub Assistant Agriculture Officer
SHED	Society for Health Extension and Development
SKS	<i>Shombhabbo Kreta Shomabesh</i> (Meeting for Potential Buyers)
SME	small and medium enterprises
SMS	short message service
SO	strategic objective
SPE	special purpose entity
SPV	special purpose vehicle
TML	The Metal (Pvt.) Limited
TMSS	Thengamara Mohila Sabuj Sangha
TOT	Training of Trainers
TVET	Technical and Vocational Education Training
US	United States
USA	United States of America
USAID	United States Agency for International Development
USG	United States Government
WFP	World Food Program
ZOI	Zone of Influence
ZOR	Zone of Resilience



Executive Summary



Above: Wheat reaping in Faridpur as part of a service commission agreement organized by machinery sales agents. Photo: Anis Rowshon.

The USAID Feed the Future Bangladesh Cereal Systems Initiative for South Asia – Mechanization and Extension Activity (CSISA–MEA) operates in the Feed the Future Zone of Influence (ZOI) in south-west Bangladesh and the Feed the Future Zone of Resilience (ZOR) in the Rohingya refugee crisis-impacted Cox’s Bazar region in south-east Bangladesh. The Activity supports scale-appropriate mechanization of agriculture in Bangladesh by building the capacity of the private sector to develop, manufacture and market innovative new technologies to enable the country’s farmers to mechanize their agricultural production, conserve labor and natural resources, and to increase profitability in the machinery value chain. The Activity’s core objective is enhancing agricultural resilience through the

development of agriculture-based light engineering (ABLE) small and medium enterprises (SMEs). CSISA-MEA works to develop a youth and gender-inclusive workforce in support of this goal. By achieving this objective the Activity aims by the end of this phase in 2024 to enable 200,000 farmers gain access to new agricultural mechanization technology by enabling agricultural related businesses to make USD \$7.7 million worth of new investments, while also working to facilitate the provision of USD \$3 million worth of finance to actors along the agricultural mechanization value chain. These efforts are supported by CSISA-MEA’s efforts to raise the skills of 2,000 staff working in the light engineering sector. This report covers the six-month period from 1 October 2022 to 31 March 2022, in the third year of the Activity.

Drilling down on building light engineering capacity and welding partnerships

Based on experience gained from implementing activities in the first two years of CSISA–MEA, it was decided to divide the Activity’s support for agriculture-based light engineering small and medium enterprises (ABLE SMEs) into two stages. In the first stage, technical assistance focuses on raising the knowledge and skills of the workforces of all the ABLE SMEs partnering with CSISA–MEA. In the second stage, those ABLE SMEs which showed a strong commitment to investing in their development are provided with tailored technical support.



Of the 84 ABLE SMEs enrolled in the Year 2 program, 14 have been selected based on their technical and business capacity to continue on to Stage 2. An additional 69 ABLE SMEs new to CSISA–MEA, of which 40 are in the Feed the Future ZOR, have signed partnership agreements with the Activity and are now in Stage 1. Many of these ABLEs will subsequently graduate into the second stage. The Activity plans to partner with another 41 ABLE SMEs in Bogura in the second half of Year 3, by the end of which CSISA–MEA will have worked with 84 ABLE SMEs (in Year 2) and 110 ABLE SMEs (in Year 3). This will bring the total number of ABLE SMEs supported to 194 by the end of Year 3.

ABLE SMEs selected for the second stage of the Activity sign a cost-shared joint venture agreement (JVA) with CSISA–MEA – to date, one ABLE SME has done so. Typically these agreements involve (a) facilitating sales growth by linking ABLE SMSs to new suppliers and markets, (b) facilitating access to manufacturing support services and modern capital machinery, (c) facilitating the development of the partner’s capacity to operate modern capital machineries, and (d) supporting the development of financial record-keeping/inventory management systems.



Above: Improvements in health and safety have resulted from the Activity’s training. Here, Ridoy Hossain has begun to wear proper foot gear and a protective visor while grinding parts for the manufacture of fodder choppers at Star Three Engineering Workshop. Photo: Md. Abdu Kader.

During the reporting period, the Activity recruited four additional engineering staff to support on-the-ground work with ABLEs, bringing the number employed to 10. These engineers



typically work in small teams of engineers and market development officers to develop a portfolio of three or four Stage 2 ABLE SMEs. With technical advice from these teams, and following residential and on-line training programs, and study tours to facilities in Dhaka and elsewhere that use modern manufacturing machinery, these enterprises are already making investments in the types of machine they will need in order to develop their capacity to make high quality spare parts at prices that will compete with imported parts. These enterprises have also begun to modify the layout of their factories to enable more efficient and safety manufacturing, putting into practice training provided by engineers from the Bangladesh Agricultural Research Institute (BARI) and advice from CSISA–MEA’s engineers. These changes are also beginning to feature improved facilities for women working at the enterprises, in addition to strong evidence for the adoption of operational health and safety (OHS) measures by machinery enterprises.

Concurrent with engineering support, the Activity has been supporting ABLE SMEs to access new markets. Lead firms importing machines such as combine harvesters and tractors have difficulty importing spare parts for these machines when needed; many spare parts could be manufactured in Bangladesh if ABLE SMEs were given technical engineering support to develop Bangladesh-made products that compete with imports. In response, the Activity worked during the reporting period to link lead firm partners with ABLE SMEs which have the capacity and capability to produce spare parts. Two of these firms –A CI Motors and The Metal Ltd (TML) – selected partner ABLE SMEs and a range of necessary spare parts to be manufactured; prototypes of these parts have been made, tested for quality and orders placed for their manufacture which are currently ongoing.

Investments in new manufacturing machinery, upgraded factory layout and premises require finance, and during this six-month reporting period CSISA–MEA has facilitated loans worth USD \$575,054 from four financial institutions (three banks and two non-bank financial institutes) for a total of 19 ABLE SMEs in the ZOI. This is nearly double more than the loan disbursement made to 11 ABLE SMEs during the same period in Year 2 of the Activity. In the ZOR, CSISA–MEA facilitated loans totaling USD \$52,352 for two dealers and two machinery service providers (MSPs) from BRAC Bank, the Association for Social Advancement (ASA), and Non-Resident Bangladeshis Bank (NRB). While the latter is relatively small, the Activity only began intensive work on access to finance in the ZoR in this reporting period; future investments are anticipated to grow dramatically.

Building the machinery manufacturing skills of young women and men, and the management skills of business leaders

In the first two years of CSISA–MEA, the Activity provided training in basic machinery manufacturing skills for 512 staff working in machinery manufacturing enterprises in Jashore and Bogura. From January to March 2022, CSISA–MEA contracted training service providers



(TSPs) who supplied training in machinery manufacturing skills to 115 staff from ABLE SMEs in Bogura, Jashore and Kushtia. All of the training included occupational health and safety (OHS), and the Activity supplied participants personal protective equipment (PPE) comprising a laboratory coat, welding shield, goggles, safety boots, cap or safety helmet, gloves, mask and hand sanitizer. In its foundry worker training, CSISA–MEA initiated the novel idea of contracting leading ABLE SMEs to train the workforce of other ABLE SMEs. In the current Activity year (October 2021 to September 2022), 180 foundry workers in Bogura will be provided with foundry skills training; of these, 60 are currently completing the 42-hour course.

In November 2021, the Activity signed an agreement with the Farm Machinery and Post-Harvest Division of BARI to provide residential training for 50 management staff from 39 ABLE SMEs, covering workshop layout, metal-testing, and certification procedures and protocols. The training started in January 2022, with significant outcomes including many ABLEs installing safety equipment to ensure workplace safety and hanging safety posters to educate workers, in addition to improving factory layout and general cleanliness and order of their workshops.



Above: Skills enhancement trainings for ABLEs on how to use machinery part sharpeners in Bogura. The Activity partners with ABLEs in this manufacturer-dense area in order to channel their business into the ZoR and ZoI. Photo: Arifur Rahman.

To improve the skills (and thus the productivity, employability and potential income) of women working in foundries, the Activity designed a training program to provide two skills (spray painting using a spray gun, and grinding and fettling) which ABLE SME owners identified



as being in demand and which can be done by women. To date, 60 women employed in Activity ABLE SME foundries have completed the training in these skills, 30 of whom have switched from painting by hand to spray painting.

In the ZOR, following a series of ‘kick-off’ meetings with ABLE SMEs from Cox’s Bazar, Chattogram and Bandarban districts, agreements were signed with 40 ABLE SMEs (9-12 March, 2022), under which their staff are to be trained in basic machining skills. The training will be conducted by the Ministry of Industry through their Chattogram Bangladesh Industrial Technical Assistance Center (BITAC) office.

One of the consequences of the COVID-19 pandemic has been the increase in the use of the Internet to conduct meetings and training events remotely. The Activity invested in 12 sets of equipment, including laptops, screens and Wi-Fi routers, that allowed workforce in Bogura, Jashore and Faridpur participate on-line in lathe operation, drilling, milling, jig operation and OHS training. This on-line training was delivered by scientists from the Farm Engineering and Post-Harvest Division at BARI. These very popular training sessions were attended by 75 to 150 participants (65% youth, 12% women) at each of the 13 sessions. In late 2021, the Activity also conducted a survey to investigate smartphone access among its ABLE SME entrepreneurs. The results showed that 47% owned a smartphone, and a further 13% were able to access a smartphone through friends and relatives. With this level of Internet access available through smartphone use, the Activity broadcast a weekly YouTube training program via WhatsApp to the CSISA–MEA ABLE SME workforce.

For ABLE SME owners with an Internet connection, engineers employed by the Activity’s lead firm partners and public sector partners such as BARI, BRRI and Bangladesh Agricultural University (BAU), Professor Dr. Jonathon Colton provided on-line training direct from Georgia Tech in Atlanta, USA in drawing, dimensions and tolerances, factory facility design and layout, and the economics of manufacturing. This training has been very influential in encouraging enterprises to invest in new machinery, to use CAD-based drawings when making new parts, and to design new factory layouts.

Sowing the seeds of collaboration and reaping the benefits of partnerships

The main thrust of the Activity’s work to facilitate the use and adoption of agricultural machinery technology by farmers has been to support lead firms to market their machines and provide comprehensive aftersales services. Thus, in the ZOI, the lead firms – TML, Abedin Equipment and ACI Motors – in partnership with CSISA–MEA conducted 124 pre-season maintenance campaigns, as well as training 55 mechanics in combine harvester maintenance and 40 combine harvester owners and operators in combine harvester use and maintenance. The Activity also facilitated a collaboration between the same three lead firms and four regional seed companies to facilitate the marketing of rice transplanters and the provision of



aftersales services, which included supporting farmers establish rice seedling marketing businesses and the establishment and training of mechanics and MSPs in the use and maintenance of these machine. Similar work was performed in the ZOR, where the Activity supported TML and ACI Motors to establish dealerships for their machines and to train farmers and MSPs in the use of combine harvesters and rice transplanter.

The results of this work are clear. During the reporting period, as a result of the Activity's work facilitating links between MSPs, lead firms, dealers and the DAE, 131 MSPs in the ZOI bought a total of 119 combine harvesters, one mini combine harvester, nine reapers and two rice transplanter, worth a total of USD1,948,673. In the ZOR, 22 local service providers (LSPs) bought a total of eight combine harvesters, four reapers and 10 rice transplanter worth a total of USD120,449.

The Activity has also facilitated the marketing of agricultural machines by supporting its partner companies, including ACI Motors, to engage women and youth as sales agents. This gives rural youth the opportunity to earn a living and start a business. The Activity has also partnered with two companies – Bhalo Social Enterprises and iFarmer – and supports them in establishing links between farmers, machinery service providers (MSPs), input suppliers and crop processors. To do this they use smartphone-based digital tools and a network of agents.



Above: CSISA-MEA partners with Shoron Engineering Works, which has begun to make improvements in manufacturing processes to enhance business performance, product quality, and occupational health and safety. Photo: Md. Abdu Kader.



Cutting fodder such as grasses and maize into small pieces to help cattle to feed more efficiently is traditionally done manually by women; however, a mechanized fodder chopper can do in five minutes what it takes one woman to do in an hour. During the reporting period, the Activity has been supporting ABLE SMEs to manufacture and market both electric- and diesel engine-powered fodder choppers, which, until recently, were mainly manually operated machines imported from India. In both the ZOI and ZOR this has involved collaboration with the USAID Feed the Future Bangladesh Livestock Improvement and Nutrition (LPIN) Activity to support ABLE SMEs and machinery dealers to conduct demonstrations showcasing the efficiencies of fodder choppers to dairy farmers with a view to increasing sales.

The USAID Feed the Future Zone of Resilience (ZoR)

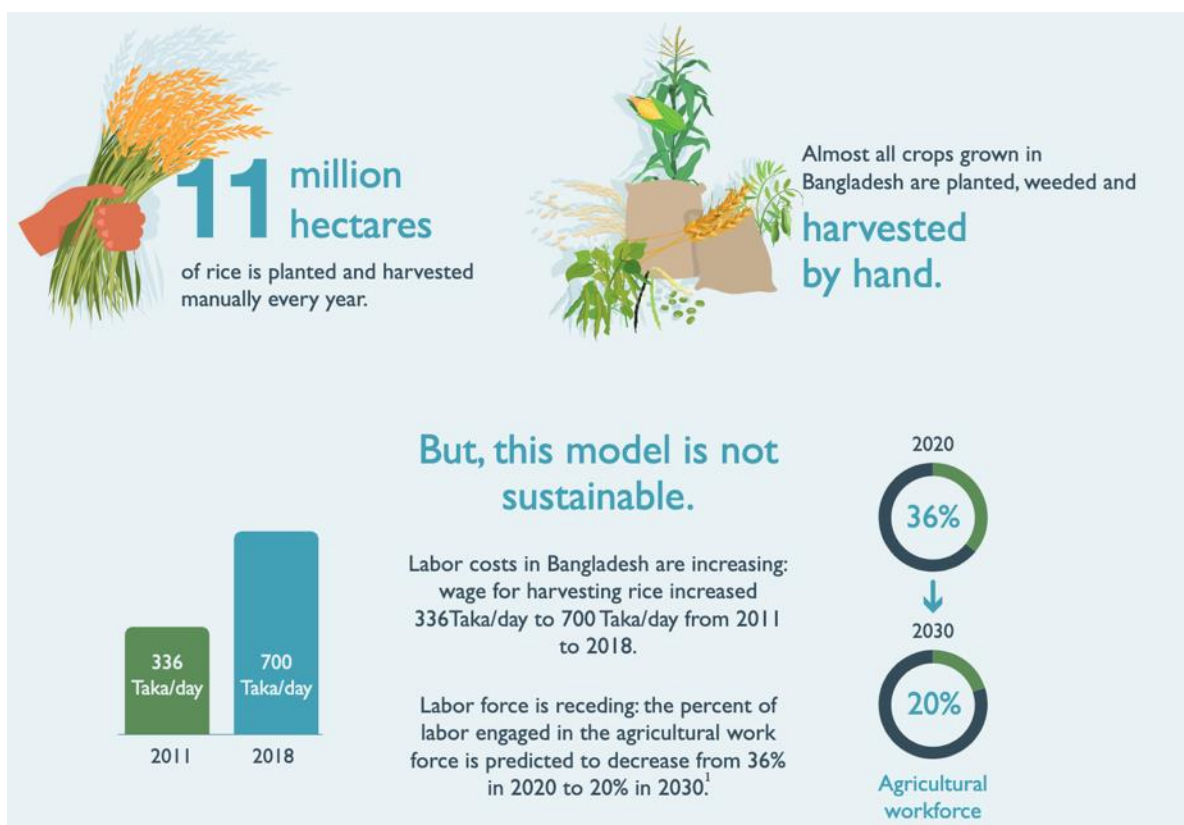
Although the Activity focuses its work in the ZOI, in the last six months, CSISA-MEA has begun to intensify work in the ZoR by engaging with the machinery manufacturing base in Cox's Bazar, Bandarban and Chattogram districts through the selection of 40 partner ABLE SMEs and one partner organization, namely the Bangladesh Industrial and Technical Assistance Center (BITAC) to provide the enterprises with training in machinery manufacturing skills. This involved a study of the constraints and challenges that ABLE SMEs and MSPs face in providing services to farmers. As mentioned above, work has also continued to support lead firms including Janata Engineering and RK Metal from the ZOI- and ZoR-based dealers, to market machinery such as combine harvesters, rice transplanters and fodder choppers and their spare parts. The Activity has also continued to support these companies to provide MSPs and farmers with aftersales services, including training for machine operators and mechanics.

The work in the ZoR has also been the focus of visits by the USAID Bangladesh Feed the Future Director, Ms. Rebecca Moanikeala Robinson, a delegation from USAID regional offices led by Ms. Anjali Kaur, Deputy Assistant Administrator, USAID–Asia accompanied by Ms. Kathryn D. Stevens, Mission Director, USAID–Bangladesh, and finally the United States Ambassador to Bangladesh, Mr. Peter Haas.



Introduction

The USAID Feed the Future Bangladesh Cereal Systems Initiatives for South Asia – Mechanization Extension Activity (CSISA–MEA) is a five-year development Activity which started in October 2019. It is implemented by The International Maize and Wheat Improvement Center (CIMMYT) in partnership with International Development Enterprises (iDE) and Georgia Institute of Technology (Georgia Tech) (more information about the Activity’s partners is provided in Annex I). The Activity responds to pressing challenges in Bangladesh’s farming systems and aims to support the mechanization of agriculture in Bangladesh by developing the capacity of the private sector to develop, manufacture and market innovative new technologies which will enable the country’s farmers to mechanize their agricultural production.



Above: Some of the key challenges that CSISA-MEA responds to.

Through work to achieve the core objective of enhancing agricultural resilience through the development of agriculture-based light engineering (ABLE) small and medium enterprises (SMEs) and develop a youth and gender-inclusive workforce, with a special focus on the Rohingya refugee crisis-affected areas of Cox’s Bazar district. This is achieved through three intermediate results:



- **Intermediate result 1:** Boost the competitiveness and efficiency of domestic and private sector-led agricultural machinery manufacturing
- **Intermediate result 2:** Enhance the institutional capacity for agricultural mechanization through the development of a skilled and youth workforce
- **Intermediate result 3:** Improve access for farmers to agricultural machinery, production and marketing services

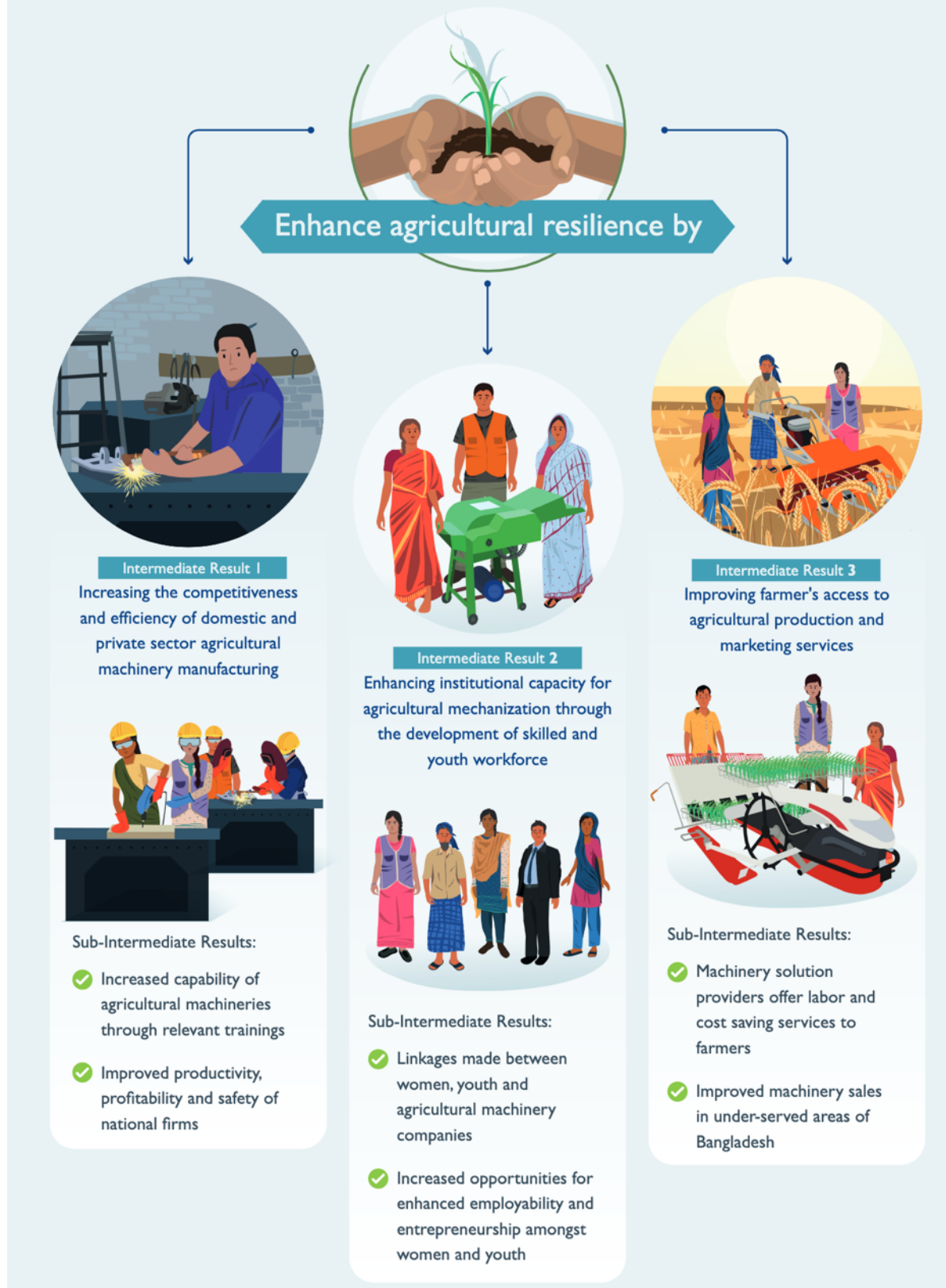
By achieving these objectives the Activity will have by the end of this phase in 2024 enabled 200,000 farmers gain access to new agricultural mechanization technology, encouraged agriculture related businesses to make USD \$7.7 million worth of new investments, to have facilitated the provision of USD\$3 million worth of finance to actors along the agricultural mechanization value chain and raised the skills of 2,000 staff working in the light engineering sector.

This semi-annual report covers the six months from 1 October 2021 to 31 March 2022, with a focus on how CSISA–MEA addresses constraints to the smooth functioning of machinery market systems by initiating partnerships with the private sector. To support the private sector to utilize public sector resources, it facilitates partnerships between these sectors. Interventions implemented by the private sector with CSISA–MEA support should be innovative, new and readily scalable. Costs and activities are rationally shared between partners and, wherever possible, confined to the provision of technical support. CSISA–MEA does not engage directly in interventions but rather plays a market facilitating role by activity funding, facilitating linkages to other organizations such as the Department of Agriculture Extension (DAE) and national research institutions and universities, and the provision of technical expertise.

As such, the Activity takes a market systems approach, building systemic change that will continue even after the Activity ends. Finally, CSISA–MEA places a strong emphasis on supporting the light engineering industry by facilitating training in manufacturing and managerial skills, manufacturing systems design, links to markets, and access to finance. This is in addition to facilitating the introduction of agricultural mechanization technology by the private sector to the Feed the Future ZOI and the Rohingya crisis-impacted ZOR.



CSISA-MEA OBJECTIVES





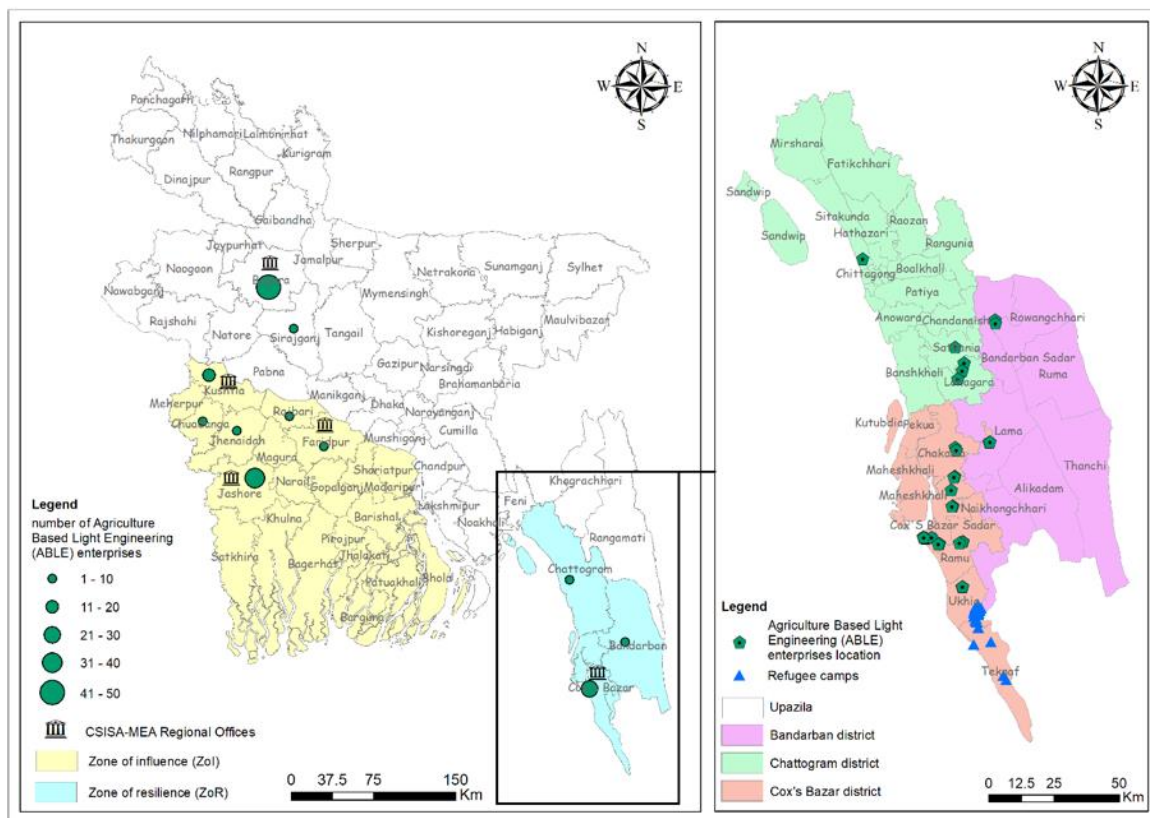
Above: Infographic presenting CSISA-MEA's interlinked objectives.

Area of operations

CSISA–MEA maintains field offices in locations across Bangladesh which are crucial for USAID's interventions, as well as for the light engineering and manufacturing industry.

Zone of Influence (Zol): *Khulna, Barisal and Dhaka divisions, with a focus on Greater Jashore and Greater Faridpur*

As well as supporting companies to market new agricultural technology, the Activity works closely with ABLE SMEs in Jashore, Chuadanga, Kustia and Faridpur towns. During the reporting period, CSISA–MEA opened an office in Kustia, which will allow the Activity to support most closely the large number of ABLE SMEs in Kustia and Chuadanga towns



Above: Maps showing location and size of ABLE SME hubs where CSISA–MEA and the USAID Zol (left) and ZoR (right) are located.



Bogura district

This Bangladesh's primary light engineering center outside Dhaka and where many machine manufacturing companies in the Feed the Future Zol obtain parts and components for the machines they make. CSISA-MEA therefore works strategically in this area, to help assure the flow of machinery and spare parts into the Zol.

Zone of Resilience (ZoR): Cox's Bazar and Bandarban districts

This region is close to the farming community which supplies agricultural products to Rohingya refugee camps. Being remote from the major commercial centers in northern and central Bangladesh, it has not attracted sizable commercial interest in terms of agricultural inputs and machinery marketing. The Activity has initiated activities in the ZoR which not only support the introduction of new agricultural mechanization technology but which also is anticipated to support the growing number of ABLE SMEs in this region. With CSISA-MEA support, these ABLE SMEs will ensure that MSPs in these areas are able to access repair services and spare parts, and in doing so expand their businesses and create employment. This is encouraging increased agricultural mechanization and at the same time provide the advantage of assisting farmers to meet the growing demand for agricultural products created by the Rohingya community.

Activity staffing

The Activity currently employs 61 staff; 21 are based in the Dhaka office and 40 in field offices; four are internationally recruited staff. The Activity also engages seven consultants on short-term assignments, three of whom are internationally recruited. Georgia Tech provides Dr. Jonathon Colton as technical lead on the engineering aspects of the Activity. Professor Colton supervises Georgia Tech postgraduate engineering students who design machinery and conduct studies for the Activity as part of their thesis research. The administration and financial management support for the Activity is provided by a pool of staff which also supports all the programs implemented by CIMMYT and iDE. During the reporting period, Ms. Elizabeth Lahiff joined iDE Bangladesh as its Team Leader for CSISA-MEA. CIMMYT also recruited four engineers as Machinery Development Officers to provide technical and engineering support to ABLE SMEs and MSPs. Annex 2 presents details of Activity staffing.



Visitors to CSISA–MEA activities in the ZOR

During the reporting period the Activity welcomed visitors from USAID and the US Embassy to observe the work of CSISA–MEA and its partners.

Ms. Rebecca Moanikeala Robinson, Feed the Future Director, USAID-Bangladesh visited Chakaria, Cox's Bazar district (14 December, 2021) with other technical experts from USAID. They were shown rice being transplanted using a rice transplanter, and women who were trained by CSISA–MEA partners to raise rice seedlings to sell to farmers who then hired a rice transplanter to transplant the seedlings. The visitors also had opportunity to interact with machinery value chain actors from the ZoR.



Above: Dr. Timothy J. Krupnik, Activity Team Lead describes CSISA–MEA activity to Ms. Rebecca Moanikeala Robinson, Feed the Future Director, USAID-Bangladesh, Chakaria, Cox's Bazar, 14 December, 2021. Photo: Jotirmoy Mazumdar, SMD, Chattogram



Above: Zakaria Hasan, Field Office Coordinator, Cox's Bazar describes CSISA–MEA to Anjali Kaur, Deputy Assistant Administrator, USAID Bureau for Asia and Kathryn D. Stevens, USAID/Bangladesh Mission Director at Chakaria, Cox's Bazar, 14 December, 2021. Photo: Saiful Islam,



Ms. Anjali Kaur, Deputy Assistant Administrator, USAID–Asia, accompanied by Ms. Kathryn D. Stevens, Mission Director, USAID–Bangladesh visited CSISA–MEA activities in Chakaria, Cox’s Bazar (27 March, 2022). The visitors also observed rice being transplanted using a rice transplanter and met women trained by Activity partner firms to raise rice seedlings to sell to farmers who use rice transplanters to transplant the seedlings.



Above: Mr. Peter Haas, US Ambassador and others, observing an MSP trained by an activity lead firm partner demonstrating use of a rice transplanter, Ukhiya upazila, Cox’s Bazar district, 22 March, 2022. Photo: Maruf Hossen Shanto.



They also observed a demonstration of the use of a power tiller-operated seeder (PTOS) for maize strip-till planting and a display of machinery including combine harvesters, reapers, mini maize shellers and fodder choppers. Finally, the USAID team met CSISA–MEA representatives of agricultural machinery lead firms, mechanics, dealers, MSPs, and farmers buying machinery services from MSPs supported by CSISA–MEA partners, and representatives from the USAID Feed the Future Bangladesh LPIN Activity who with CSISA–MEA are introducing fodder chopping machinery through partnerships with ZOI-based machinery manufacturing companies.

US Ambassador to Bangladesh, Mr. Peter Haas, accompanied by his wife, Mrs. Amy Haas, visited CSISA–MEA activities in Ukhiya, Cox’s Bazar on 27 March, 2022. Accompanying the Ambassador were Mr. Dustin Duong, Assistant Regional Security Officer, Mr. Sheik Shibly, Foreign Service National Investigator, Ms. Mackenzie Rowe, Regional Refugee Coordinator, PRM, Mr. Istiak Ahammed, Refugee Assistant, PRM, Ms. Sophia Meulenberg, Political Officer, Ms. Ellen de Guzman, Director, USAID Humanitarian Assistance Officer (HAO) and Mr. Mahadi Hasnat, Information Assistant.

National agricultural mechanization workshop

In partnership with Bangladesh Agricultural University (BAU), the Activity held a workshop for agricultural mechanization value chain actors on “Agricultural Mechanization in Bangladesh – The Future” at the Pan Pacific Sonargaon hotel, Dhaka (21-22 March, 2022). This international workshop’s purpose was to review progress made in Bangladesh with agricultural mechanization, the impact this has had on rural society in Bangladesh, and how the increase in the availability of a rural labor force will support the industrialization of the Bangladesh economy.



Above: Agricultural Mechanization in Bangladesh – the Future, Pan Pacific Sonargaon hotel, Dhaka, 21–22 March, 2022. Picture credit: Uttam Barma.



The workshop was attended by 297 participants from a wide range of sectors including agricultural machinery-based light engineering enterprises, machinery marketing companies, public and private sector finance institutions, micro finance institutions, the DAE, representatives of national agricultural research stations (NARS), the Ministry of Industries, international development organizations, USAID and academia. The inaugural session was attended by the Honorable Minister Dr. Muhammad Abdur Razzaque, Member of Parliament, Ministry of Agriculture, Government of Bangladesh.

The workshop sessions included panel discussions and presentations on:

1. Agricultural mechanization in the context of economic development in Bangladesh
2. What have we learnt about adoption of agricultural mechanization?
3. Manufacture of agricultural machines and spare parts
4. Access to Finance and business development

Each session was followed by a panel discussion led by a moderator and a panel of sector specialists, who also took questions from the audience. See Annex 3 for details.

Achievements during the reporting period

The following sections report on the progress made with implementing activities, against the workplan presented to USAID for approval in September 2021. Activities implemented under each Intermediate Result are presented in the sections below.



Above: During the reporting period, CSISA-MEA worked to link SMR Agro Engineering and Agrani Bank Limited in Jashore District to facilitate business arrangements resulting in the approval of a loan at a low interest rate of 4% to expand manufacturing and sales of mechanized fodder chopping equipment. Photo: Md. Khaleduzzaman.



Intermediate Result I: Competitiveness and efficiency of domestic and private sector-led agricultural machinery manufacturing boosted

Intermediate Result I



Developing the manufacturing capacity of small- and medium-scale agriculture-based light engineering enterprises

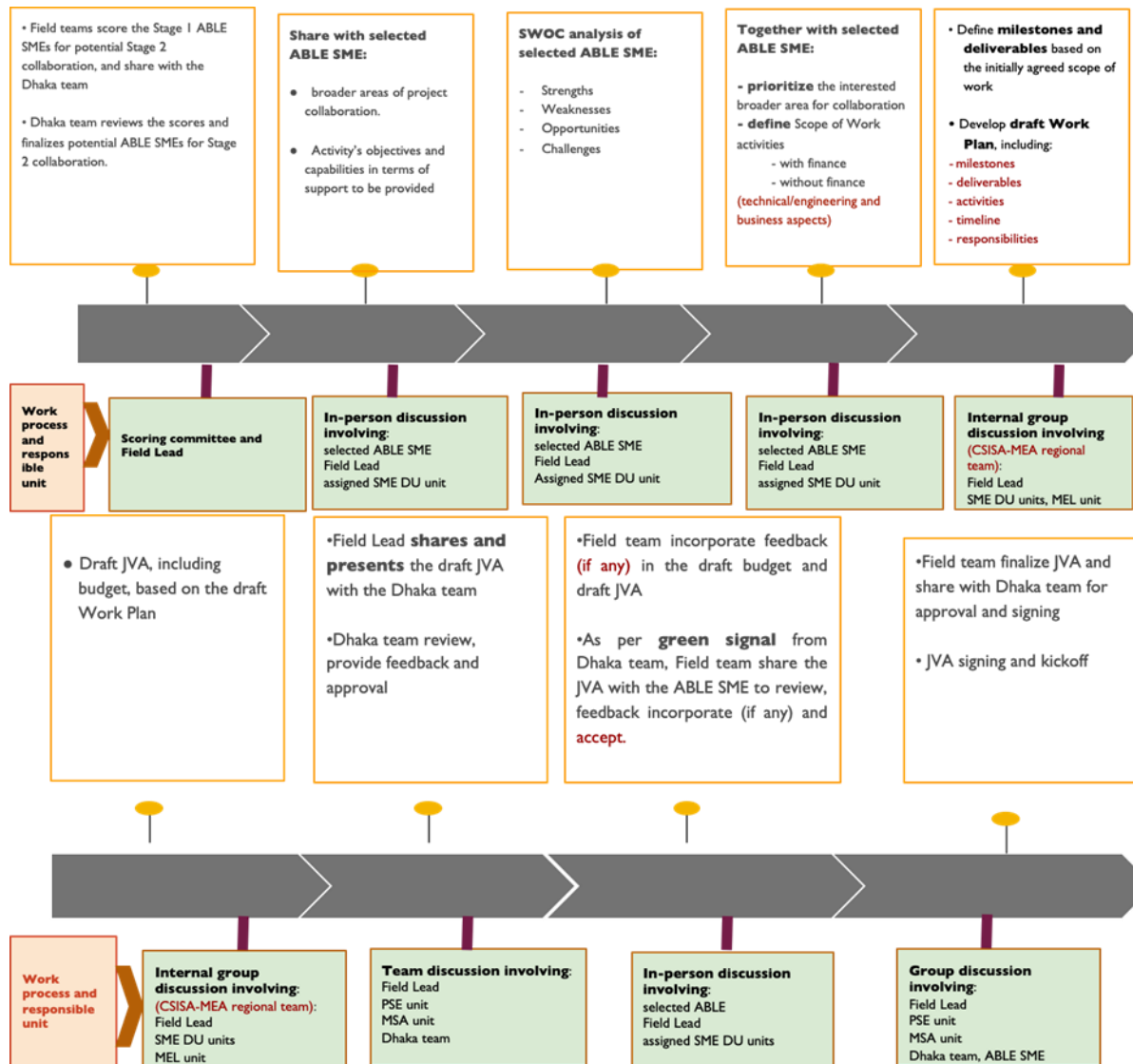
During Year 2 of the Activity, CSISA–MEA provided technical, business and workforce support to 84 ABLE SMEs in the Feed the Future ZOI. It became clear that without the Activity’s intense support, not all the ABLE SMEs would have the capacity to develop their business beyond receiving staff training. The Activity therefore decided to focus on those ABLE SMEs demonstrating a strong interest in the support provided, and with the commitment and capacity to implement next steps to create significant changes in the success of their businesses. Activity support to ABLE SMEs is now therefore divided into two stages. In the first stage, technical assistance focuses on raising the knowledge and skills of the workforce of all the ABLE SMEs partnering with CSISA–MEA. In the second stage, those ABLE SMEs able to demonstrate a strong commitment to investing in development are provided with tailored technical support. This support is co-designed with the individual ABLE SME and is based upon a detailed analysis of its capacity, as well as its commitment to a program of market and company growth.

ABLE SMEs participating in the Activity start by signing a consent letter with CSISA–MEA, confirming their commitment to receiving general workforce training. Those which qualify to enter the second stage sign a cost-sharing joint venture agreement (JVA) with CSISA–MEA. The figure below shows the ABLE SME screening, selection and JVA co-designing workflow process. This is designed to ensure an unbiased and transparent approach to providing ABLE SMEs with tailored support.

ABLE engagement for Stage I support



During its third year (October 2021–September 2022), the Activity expanded its geographic operations into the ZOR and engaged ABLE SME hubs in Cox’s Bazar, Chittagong and Bandarban districts. Within the ZOI there has been an expansion of activities out of Jashore town and into ABLE SMEs hubs in Faridpur, Kustia, Khulna and Satkhira districts.



Above: Steps in the process of selecting and negotiating terms for engaging ABLE SMEs in Stage 2 cost-shared joint-venture partnership with CSISA–MEA

Of the 84 ABLEs enterprises which participated in the Year 2 program, 14 have been selected to continue to Stage 2. An additional 69 ABLE SMEs new to CSISA–MEA (40 of which are in the Feed the Future ZOR) have entered the system and are now engaged in Stage 1. The Activity plans to partner with another 41 ABLE SMEs in Bogura in the second half of Year 3. This means that by the end of Year 3, CSISA–MEA will have worked with 84 ABLE SMEs in Year 2 and 110 ABLE SMEs in Year 3, bringing the total number of ABLE SMEs supported by CSISA–MEA to 194.



Following the signing of consent letters, CSISA–MEA field office teams in Faridpur and Jashore held a total of three meetings (one each in Faridpur, Jashore and Kustia) during the reporting period with 29 ABLE SME partners. During these meetings, the Activity was able to explain in detail the planned activities that are designed to support them in expanding their businesses.



Above: kick-off meeting with Faridpur ABLE SMEs, 24 February 2022. Picture credit: Md. Rowshon Anis.

In the ZOR, 55 ABLE SMEs submitted Expressions of Interest in response to a call published in local media for those interested in working with CSISA–MEA. Of these, 40 have signed letters during inauguration workshops, agreeing to their participation in programs to provide them with training and technical support.



Above: (left) CSISA–MEA inaugural workshop with ABLE SMEs, Cox's Bazar district, March 2022. Photo: Jotirmoy Mithu; (right) ABLE SME owners from Cox's Bazar and Bandarban districts, signing a joint venture agreement with CSISA–MEA during the inauguration workshop, Cox's Bazar, March 2022. Photo: Md. Shihab.



Above: Mohammad Ali Engineering Workshop, Jashore, signing a Joint venture agreement with CSISA–MEA, March 2022. This JVA will help to facilitate: sales growth by extending the company’s business network and supply chain, capacity building for manufacturing quality parts through access to business support services, manufacturing capacity development through access to capital machinery, an efficient human resource pool for operating modern capital machineries. Photo: Jashore team staff.

The Activity also formed a WhatsApp group, to initiate collaboration and to serve as a platform for self-learning and information-sharing. The group comprises managers and owners of ABLE SMEs in Cox’s Bazar district and members of their workforce. At the time of writing, the WhatsApp group has 64 active members. The Activity also conducted a study of 68 ABLE SMEs to better understand the scope, capacity and workforce of the light engineering industry in the ZoR. The study findings are scheduled to be published in May or June of 2022.

ABLE engagement for Stage 2 support

In the ZoI, the Activity selected 14 ABLE SMEs to provide with customized support, who are now designing agreements, facilitated by CSISA–MEA. In the next six months (April–September 2022), an additional three ABLE SMEs from within the ZoR will also be selected.

The process of developing a JVA begins with a participatory strengths, weaknesses, opportunities and threats (SWOT) analysis of an enterprise’s business development needs – including an assessment of its needs in terms of inventory management, business linkages, soft skills training and access to finance – and technical development needs, such as heat treatment services, access to quality raw materials, pattern and die support and layout and installation support for capital machinery. CSISA–MEA began extending support to Stage 2 ABLE SMEs even before JVAs were signed.



ABLE SMEs selected for Stage 2 engagement in the first half of Year 3

Jashore	Bogura
Wohab Engineering Workshop	Sarkar Agro Engineering and Multiple Works
Shilpi Metal Foundry	Sonny Trade & Engineering
Ripon Engineering Workshop	Hannan Engineering Workshop
New Rifat Engineering Workshop	Mayer Doa Engineering and Iron Store
Naimun Engineering Workshop and Foundry	Rony Engineering & Machineries
Latif Engineering Workshop	Rahmaina Engineering Workshop
Rahman Foundry and Engineering Workshop	
Mohammad Ali Engineering Workshop	

Key examples include how in Jashore, Naimun Metal & Engineering Workshop was linked with pattern developer Akbar Pattern Works, which has agreed to provide pattern development support to the ABLE SME for the manufacturing of various spare parts for agricultural machinery. In Bogura, Kamal Machine Tools received orders for two power thresher machines through social media advertising developed with support from CSISA–MEA, Rahat Machineries installed a low-cost cupola furnace with technical support from CSISA–MEA engineers, meaning a more efficient molding system could be adopted, and Abu Talha Engineering and Hannan Engineering workshops purchased new, more efficient grinding and drilling machines. In Faridpur, CSISA–MEA facilitated a deal between RM Metal and ACI Motors to supply ACI motors with PTOS, threshers and bed planters. With CSISA–MEA support linking RK Metal to buyers in India, RK Metal was able for the first time in Bangladesh’s history to export three ‘Aashkol’ jute fiber extraction machines to India.



Above: The Aashkol jute fiber extraction machine, packed by RK Metal ready for export to India, 31 March, 2022. This is the first time in history that machinery for jute expansion was exported to India from an ABLE in Bangladesh, and was made possible through business linkages facilitated by CSISA-MEA. Photo: Md. Rowshon Anis.



Linking ABLE SMEs and machinery and spare parts dealers

To enable agricultural machinery and related spare parts dealers to source equipment and spares from ABLE SMEs rather than from Dhaka or beyond, CSISA–MEA arranges meetings to facilitate connections between ABLE SMEs and dealers in Bangladesh. This builds on similar activities implemented in Year 2 of the Activity. So far in Year 3, 26 ABLE SMEs (12 in Jashore, 14 in Bogura) have been linked with 28 dealers (15 in Jashore, 6 in Bogura and 7 in Cox’s Bazar districts) to increase access to a wide range of agricultural machinery parts.

In the ZoR, the market for parts produced by ZoR manufacturers has historically been extremely limited. This is due in large part to the relative neglect for this area as it lies far to the south of the country and outside the major business and agricultural regions of Bangladesh. In response, CSISA–MEA adopted the innovative approach of taking a group of seven Cox’s Bazar-based dealers to meet nine ABLE SMEs machinery parts manufacturers in Bogura, to determine if the dealers would be interested in marketing parts made in Bogura. The group identified a number of parts they could sell through their dealerships in Cox’s Bazar and to date have conducted USD \$12,753 worth of business with the Bogura-based businesses.

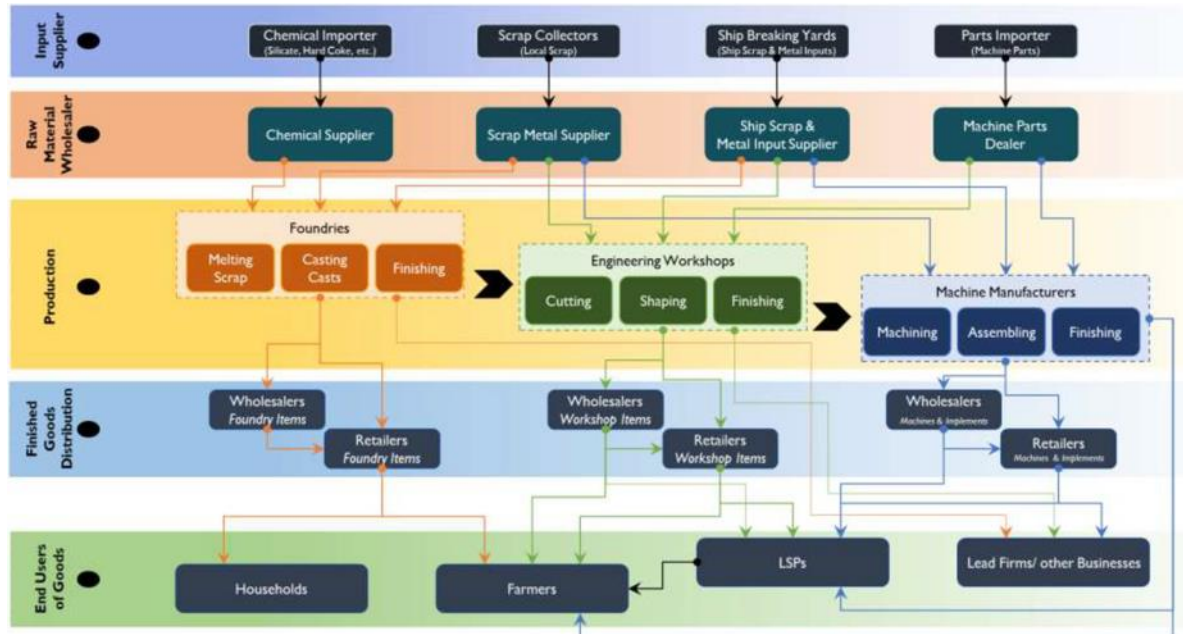
Supporting ABLE SMEs to gain access to quality raw materials

Most of the raw materials – mainly iron and steel – used by the Bangladesh light engineering industry are obtained from ship-breaking operations in the Chartogram area. The labeling of these raw materials is minimal. They are given titles such as CI (cast iron), MS (mild steel), SS (stainless steel), and CS (carbon steel), meaning that their exact composition and quality of metal is unknown. Moreover, most ABLEs do not have testing laboratories, nor do they have the skills necessary to interpret metallurgic test results, leading to difficulties in producing quality castings and products. In response to this challenge and to develop a strategy for improving the quality of raw materials available to ABLE SMEs, CSISA–MEA commissioned consulting firm INSPIRA to conduct a study of the raw material supply chain.

The study showed that foundries and machine shops in Bogura and Jashore areas annually use 77,500 t of ferrous and non-ferrous materials worth USD \$67.5 million. As this material is largely of unknown composition, quality of the machinery parts produced can be very variable. This leads to a preference among buyers for imported rather than nationally produced machines and parts. To address this, the study recommended that there needs to be developed a network of metal testing centers within the light engineering hubs in Jashore and Bogura. It also recommends that there is a need to change national-level policy on taxing imported steel and other raw materials. Currently these imported raw materials are heavily taxed while imported parts and machines are comparatively lightly taxed or even subsidized. Together, testing to ensure that the quality of steel and other metals used are of the correct



quality, and reducing taxes in imported raw materials, would allow ABLE SMEs to produce parts that compete with imported parts and machines both in quality and price.



Above: Simplified agricultural machinery and spare parts value chain in Bangladesh depicting the importance of scrap metal and metal input suppliers in providing raw materials to foundries, engineering workshops, and to manufacturers.

Exposing ABLE SMEs to new technologies

To improve the competitiveness of ABLEs, CSISA–MEA supports workshops and foundries by exposing them to new technology and manufacturing techniques. During the reporting period this included:

1. Visits by 13 ABLE SMEs (11 in Bogura and 2 in Jashore) to see metal heat treatment facilities and commercial services providers, to enable them to develop the casts used by foundries to make parts
2. Support for seven ABLE SMEs in Jashore with AutoCAD factory layout design and technical support aimed at facilitating the purchase and installation of capital machinery in their factories. This resulted in the purchase of 28 different types of machine including plasma cutters and induction furnaces
3. Visits by five Bogura ABLE SMEs to Jashore to view four induction furnaces and learn about the advantages of using the new technology
4. A marketing visit by an induction furnaces manufacturing company from India to two ABLE SMEs in Jashore to discuss the installation of induction furnaces
5. Facilitating metal heat treatment by BITAC of 15 spare parts ordered by lead firms for four ABLE SMEs



6. A new product line launched by four ABLE SMEs in Jashore following linkages made by CSISA–MEA with lead firms. The product lines included fodder choppers, threshers, mini power tillers and parts for combine harvesters
7. Creating linkage with BARI to facilitate support to ABLE SMEs with submitting applications for government subsidies for machinery and manufacturing equipment.

The [CSISA–MEA Annual Report 2021](#) explained how in Year 2 the Activity organized 17 ABLE SMEs from Jashore and Bogura districts to visit Dhaka to observe advanced light engineering manufacturing equipment in use by BITAC and Bright Light Corporation Engineering. As a result, several of the visiting ABLE foundries, including Reza Engineering, Al Madina Metal Works, Uttara Metal Industry and Ma Metals, are installing induction furnaces in the Jashore and Bogura areas. Induction furnaces run on electricity and pollute less than cupola furnaces, which are fired by coke. They allow for the better control of the chemical composition of metals, helping to alleviate some of the low quality issues of metals acquired from ship-breaking operations. They can also be used for steel and aluminum casting, expanding the materials that these foundries can work with. CSISA–MEA engineers will provide technical support for installation and use.



Above: ABLES gain access to quality manufacturing equipment. A newly installed induction furnace at CSISA–MEA partner Star Three Engineering in Jashore in the Zol. Photo: Jonathan Colton.



Above: ZH Star Brick and Block's cement block and paver fabrication machine, which replaces one-half of the stones required with ground-up slag, Bogura, 27 March, 2022. Photo: Jonathan Colton.

As a result of its involvement with the Activity, lead firm Janata Engineering in Chuadanga has purchased extensive new equipment including a computer-controlled press brake for sheet metal forming and a forging machine to punch and stamp parts. It has also added a number of lathes and mills, some with digital readouts. CSISA–

MEA helped Janata with the selection and acquisition of this equipment. Other workshops such as Three Star Engineering have acquired manufacturing equipment, as described in the next sections.

Utilizing light engineering waste

Slag is a by-product of the casting process and is widely produced by foundries in Bangladesh. It consists of glass-like oxides and is typically disposed of in an environmentally unsound manner. As a result of technical support from the Activity, ZH Star Bricks and Blocks in Bogura is now collecting this material from foundries to make construction bricks and paving blocks that can replace bricks made in environmentally-polluting brick kilns. These blocks made from slag are less expensive to make and to use than clay bricks. This is because they are larger (so fewer bricks and blocks are needed) and more uniform (so less grout is needed when constructing a wall). CSISA–MEA staff are currently involved in developing a computer program to optimize the routing of trucks to collect the slag, based upon cost (if any), amount needed, and distance between the block manufacturer and foundries in the Bogura area. Further details on the use of this innovative software will be provided in the Annual Report for 2021-2022.



In Focus: Supporting the new generation of light engineering business owners

Thirty-six-year-old Md. Mahafujur Rahman, owner of Star Three Engineering Workshop, Jashore, and 37-year-old Md. Abu Bakkor Siddiq Rony owner of M/S Rony Engineering Workshop, Bogura are typical of the new generation of light engineering business owners. They are business management or accounting university graduates who took over a business from parents or friends. They inherited workshops equipped with old, out-of-date machinery, and a poorly trained workforce that makes small quantities of low quality spare parts for simple machines – but they are also young, ambitious, and typical of the type of business owner CSISA–MEA wants to support.



Above: Md. Abu Bakkor Siddiq Rony, M/S Rony Engineering, Bogura, 4th April 2022. Photo: Ali Haydar Rumel



Above: Md. Mahafujur Rahman, owner of 3 Star Engineering Workshop, Jashore, 4 April 2022. Photo: Md. Khalekuzzaman.

They have both been active participants in workforce skills and business management training, and were part of the visit organized by CSISA–MEA to light engineering firms in Dhaka to see in action some of the new machinery that the Activity is promoting, such as induction furnaces, and computer controlled metal drilling, cutting and lathing machinery. They both struggled to keep their businesses alive through the COVID–19 epidemic, but with help from CSISA–MEA, obtained bank loans that kept their businesses afloat. They are now considering their next step, including investing in some of the advanced machinery they saw as part of the training program. To support them, CSISA–MEA has provided engineering advice and facilitated loans from banks and non-bank finance institutes. Rony Engineering secured a loan from BRAC Bank worth USD82,350 to purchase the computer numerical control (CNC) lathe and induction furnace. Three Star Engineering secured a loan of USD18,529 from Industrial Development Leasing Company (IDLC), a non-bank finance institute, to restock the business with raw materials and expand production into new product lines.

These are just two examples of how CSISA–MEA is supporting the next generation of light engineering workshop owners to advance their enterprises to create modern productive engineering businesses, able to compete with imported machinery and spare parts in terms of quality, quantity and price. “If the support from the CSISA–MEA Activity goes on like this, I’m hoping that as a result of the expansion of my machinery business I’ll be able to sell to my customers quality machines at competitive prices.” said Mr. Mahfuzur Rahman, owner of 3 Star Engineering Workshop.



Facilitating the development, testing and marketing of new agricultural machinery technology

The Activity is coordinating a number of ongoing activities aimed at supporting the development and production of new agricultural machinery technology, via a collaboration between CSISA–MEA, ABLE SMEs and lead firms.



Above: Manual jute extraction is labor intensive and causes problems for water quality. Photo: The Daily Sun.

Jute fiber extraction machinery:

Jute is cultivated for its fiber and is the basis for a major jute processing industry in the Zol. This part of Bangladesh alone produces 33% of

global jute production. Jute fiber is normally extracted from jute stems by first submerging the jute stems in water for about two weeks (a rotting process called retting), after which the fibers can be pulled away from the pith of the jute stick, leaving bundles of fiber and the pith, known as the jute stick. Jute sticks are widely used as fuel, fencing, as supports for climbing plants and in the manufacture of particle boards.

The extraction of jute fiber is a very labor intensive process requiring considerable amounts of both family and hired labor. Introducing machinery that could extract the fiber from jute would therefore have potential for reducing labor costs and increasing profits for jute farmers. In 2020, CSISA–MEA partnered with Practical Action Consulting Bangladesh (PAC) to support machinery manufacturing companies to design, test and market jute fiber extraction machines. PAC has supported similar work in the past, which led to the re-engineering of an imported machine named *Aashkol*.

However, the *Aashkol* machine breaks the jute sticks, making them difficult to use and sell. To address this, the Activity led discussions with BARI and RK Metal to develop a jute decorticator machine that does not break the jute stick. In 2021, students at Georgia Tech designed and fabricated a prototype that was shipped to Bangladesh and handed over RK Metal in Faridpur for field-testing and modifications. This was found to strip the fibers from the jute successfully but with room for improvement. At the same time, BARI scientists modified the existing *Aashkol* machine to strip the jute without breaking the jute stick. As with the Georgia Tech machine, the BARI machine needs to be improved. CSISA–MEA and BARI have entered into a research agreement to improve both machines, with the aim of producing one machine that incorporates the best features of both designs..

Horticultural planting machinery



CSISA-MEA is also collaborating with engineers and scientists from BARI to develop an onion seedling and garlic clove planter.



Above: Field testing the self-propelled garlic clove planter in Faridpur district, 24 March, 2022. The Activity has facilitated modifications to be made in the cups and in the hoppers, to reduce the pick-up of multiple cloves and vibration-induced dropping of cloves. Photo: Jonathan Colton

The Activity purchased three types of commercial garlic planting machines: manual, self-propelled, and four-wheel tractor-driven. Field tests of the manual and self-propelled machines were partially successful and revealed the need to modify the planter cups to take account of the smaller garlic cloves that Bangladesh produces.

Developing the manufacturing capacity of lead machinery sales firms

Spare parts, particularly for new types of machinery such as combine harvesters, often have to be imported into Bangladesh, as local manufacturers have not yet developed the capacity to make them. These parts arrive late, and are expensive and difficult to obtain. With the right technical support and training however, Bangladesh's ABLE SMEs should be able to make these parts. Large Bangladeshi firms importing agricultural machinery are aware of the problem and are keen to find in-country suppliers who can provide parts faster, as long as they are of a



comparable quality and price to imported parts and machinery. In Year 2, CSISA–MEA signed service agreements with ACI Motors and The Metal Limited (TML) that support the firms' identification of light engineering workshops in Bogura and Jashore which have the capacity to manufacture spare parts for combine harvesters and other machinery, while at the same time meeting their quality and cost requirements.

TML and ACI staff engaged in business scoping meetings with 15 ABLE SMEs (seven in Bogura,



Above: 18-tooth sprockets manufactured to quality standards by ABLEs collaborating with the Activity that now sell to large firms such as ACI and TML. Photo: Arifur Rahman.

eight in Jashore), resulting in the ABLE SMEs identifying the parts they could make and producing prototypes for quality testing. TML has now placed orders worth USD793 with four of the ABLE SMEs (two in Bogura, two in Jashore) for tractor steering columns, gearbox covers, brake drums and front weights, and combine harvester pulleys. ACI identified 18 parts which six ABLE SMEs produce that meet its requirements, and has placed orders with one ABLE enterprise for the supply of combine harvester sprockets.

Another approach to solving the spare parts supply problem has been to link the owners of agricultural machines, MSPs, and the dealers who sell parts to MSPs with spare parts manufacturers. In Jashore, 16 combine harvester owners were introduced to two ABLE SMEs

(Khan Engineering Workshop and New Rifat Engineering Workshop) and five spare parts dealers. Through technical support provided by CSISA–MEA, the two ABLE SMEs were able to quickly supply urgently needed spare parts, either direct to the MSPs or through the dealers. These orders included 50 fodder choppers and spare parts for combine harvesters, tractors, PTOS and power tiller parts.

Supply chain manufacturing

Another development facilitated by CSISA–MEA has been the outsourcing of the making of some parts by medium-sized machinery manufacturers to smaller manufacturers. An example is RK Metal, a rapidly growing machinery manufacturer in Faridpur, which was finding it difficult to match demand for its machines with the capacity of its relatively small workshop. A solution facilitated by CSISA–MEA, was for RK Metal to outsource the manufacture of some of the parts they needed to other enterprises, leaving them with just the task of assembling the machines on their premises. To achieve this, CSISA–MEA linked RK Metal with three of the



Activity's Stage 2 ABLE SMEs (two in Jashore and one in Bogura), which are now producing PTOS spare parts including side and chain covers, power sprockets, burnets and pulleys.

Supporting foreign investment in agricultural machinery manufacture and marketing

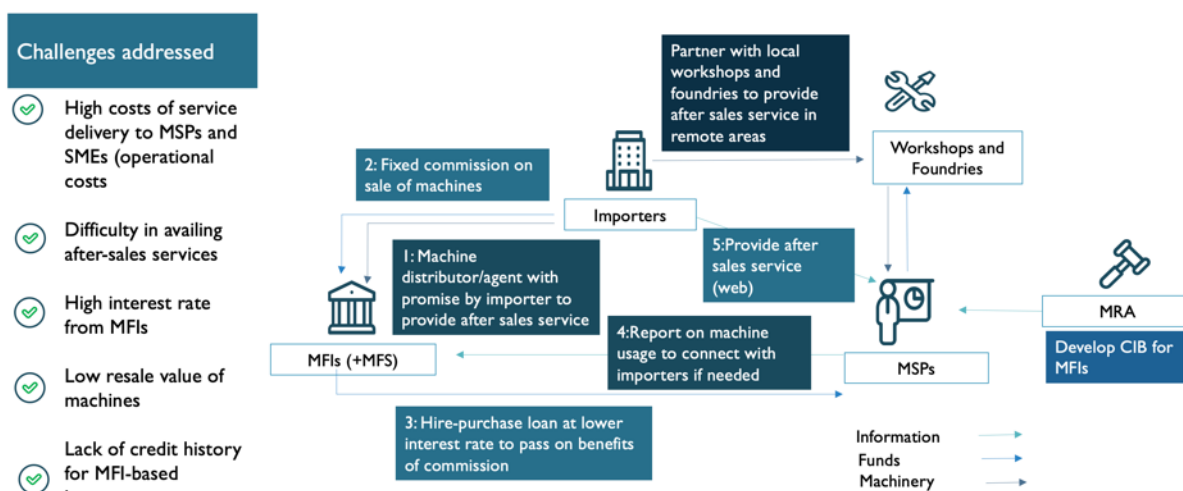
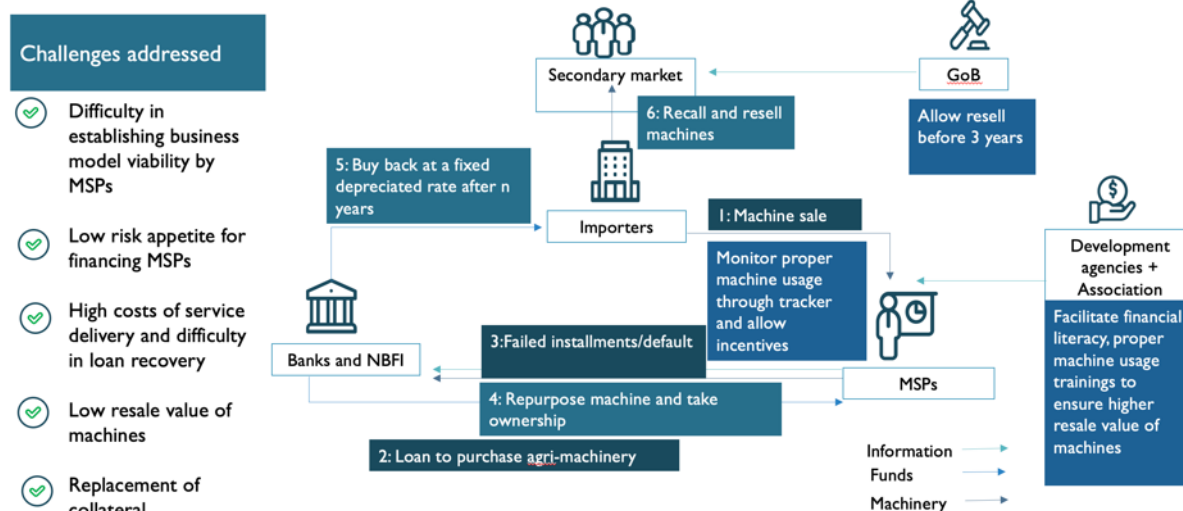
Attempts to forge partnerships between CSISA–MEA and potential foreign investors in the Bangladesh agricultural machinery business have so far not been successful. This is despite discussions with a range of regional and international companies including the John Deere tractor company of the USA. The main constraint has been that these companies do not have technology which suits Bangladesh's agricultural conditions in which small fields and often waterlogged soils are common. Additionally, most international firms located outside of Asia consider the Bangladesh market to be relatively small, do not want to invest in making machines specifically adapted to conditions in Bangladesh.

It is possible though that venture capital investors could be attracted to invest in some of the rapidly emerging medium-sized agricultural machinery manufacturing companies and in digital finance and service providers. There have been a number of discussions with these investors such as BD Angels, TruValu and LightCastle Partners, and it is anticipated that they will make investments in the agricultural machinery sector. More on this is discussed under the section on access to finance, below. The Activity is also pursuing opportunities with Land Force, a major Indian machinery manufacturer, to enter the Bangladesh market. Representatives from this company will visit Bangladesh in May or June of 2022, and as such, further details on outcomes from business facilitation work will be presented in the 2021-2022 Annual Report.

Developing financial services for ABLE SMEs

Access to finance study

For many banks and other financial institutions, financing the relatively small loans that regionally-based ABLE SMEs businesses need is costly and, given they are often financially insecure, risky. Banks are also often reluctant to lend to ABLE SMEs, many of whose financial records are not good enough to enable them to demonstrate to lenders that their business is viable and that they are capable of repaying loans. From the perspective of ABLE SMEs, the need to provide collateral, often in the form of a property mortgage, deters owners from taking out a bank loan. As a consequence, many ABLE SMEs either take out a short-term loan from a micro finance institution (MFI) (which attracts high interest rates) or use finance from business earnings. In both cases, the finance that they can raise is small, making it difficult to make the purchase of new machinery or expansion to their business premises needed to improve the quality and volume of machinery produced.



Above: Two potential alternative financing models, the first focusing on lack of collateral, the second on lack of credit history by borrowers, identified through research conducted in the reporting period to support agricultural machinery manufacture in Bangladesh. Ideas such as this are now being pursued with financial services providers through the Activity.

To gain a better understanding of the issues affecting borrowers and lenders, and to identify ways to address constraints to access to finance affecting all agricultural machinery value chain actors in the ZOI and ZOR, the Activity commissioned a study from LightCastle Partners (for the full report and a power point presentation that summaries the findings are available on the CSISA website [here](#)).

The study found that between 36% and 40% of workshop ABLE SMEs had been able to gain finance from banks. For foundries, which in general are larger enterprises, between 36% (in Jashore) and 78% (in Bogura) obtain finance from banks. Most ABLE SMEs (73% to 80%) want to expand their business, all of which would like to do so by utilizing a bank loan. Most of those with bank loans did not face a challenge obtaining it; however, approximately 27% to



29% did, with the most difficult challenges being lack of collateral, followed by inadequate documentation.

The study recommended testing three different ways of providing finance to ABLE SMEs and MSPs:

1. Loans provided by banks, with a buy-back guarantee provided by the machinery marketing company in the event the MSP was unable to repay the loan
2. Loans provided by an MFI to the MSPs, with the MFI offering a larger loan and better repayment terms in exchange for earning a commission when they sold a machine to an MSP
3. Investments in ABLE SMEs by venture capital companies on a profit-share basis

Support for access to finance

In the 2020-2021 reporting period, the Activity supported ABLE SMEs to obtain loans, and continued this work into the third year of the Activity. To support financial services institutions to identify suitable clients, and using a screening system developed in Year I of the Activity, CSISA–MEA compiled a list of ABLE SMEs considered capable of repaying a loan. This list was given to financial services institutions that expressed an interest in financing ABLE SMEs.



Above: CSISA-MEA supports machinery businesses to apply for and receive agreements for loans Photo: R. Martin.

In the Zol, CSISA–MEA facilitated linkages between financial institutions and 28 ABLEs (18 in Jashore, 10 in Bogura), two dealers and 18 potential MSPs, and gave the SMEs guidance with how to prepare documentation and applications. This resulted in loans worth USD \$224,706 being given to nine ABLE SMEs in Jashore, and loans worth USD235,295 being given to three ABLE SMEs in Bogura. The loans were provided by BRAC Bank, IDLC, Agrani Bank, and



Islamic Finance & Investment Ltd. The total value of the loans given to the 12 ABLE SMEs was USD460,001. Interestingly, this is 85% more than the loan disbursement during the same period in Year 2 of the Activity to 11 ABLE SMEs. This trend is probably partly a result of pressure from the government on banks to lend more to the SME sector. In Bogura, GUK facilitated loans to seven workshops that had been trained for improved manufacturing and business standards by the Activity, totaling USD \$87,407 worth of loan products.

In the ZoR, CSISA–MEA facilitated four linkage meetings between dealers and MSPs, and BRAC Bank, the Association for Social Advancement (ASA), and Non-Resident Bangladeshis Bank (NRB). As a result of these meetings, two agricultural machinery dealers and two MSPs received loans worth a total of USD52,352. Most loans facilitated by the Activity in 2021 were for working capital needed by enterprises to survive the COVID-19 crisis. This continues to be the case in 2022, although out of the 12 loans provided in the ZOI, four were solely or partly for the purchase of new types of equipment, including induction furnaces or CNC lathes, or for expanding business premises. These machines were purchased with technical support from CSISA–MEA.

Intermediate Result II: Enhanced institutional capacity for agricultural mechanization through the development of skilled and youth workforce



Intermediate Result II

Technical skill training for ABLE company staff and management

Zone of Influence and Bogura

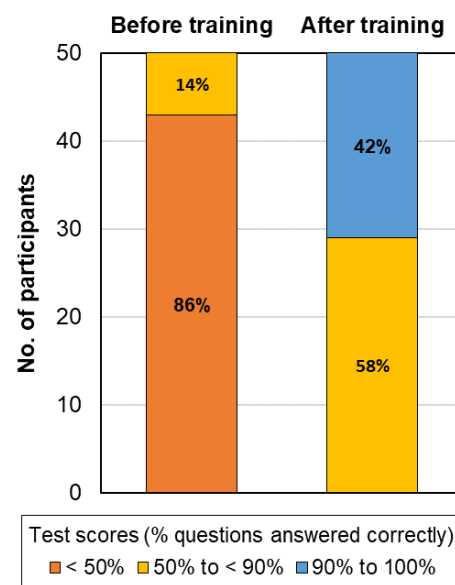
In the first two years of CSISA–MEA, the Activity provided 512 members of machinery manufacturing enterprises in Jashore and Bogura towns with training in basic machinery manufacturing skills. Implementing this training program afforded CSISA–MEA staff the opportunity to learn important lessons which have been incorporated in a revised training curriculum for the training this year. The main lessons learnt have been:



1. The Activity developed a worker-to-worker training model, in which ‘master trainers’ (members of the workforce trained by TSPs) train their co-workers. This model did not work as well as expected, mainly because master trainers have busy work schedules which makes it difficult for them to find time to train others. However, it was observed that the trained workforce members taught their co-workers informally as and when needed, supplying technical advice and correcting mistakes.
2. Training in the previous two years was held in the evening at the end of a long tiring day when participants found it hard to focus on learning. With this learning in mind, training is now held over two full days, every weekend for a four week period.
3. Women workers were never allowed to attend any training by their employers and by their family members. The Activity analyzed employers’ resistance to allowing women employees to attend training.
4. The Activity recognizes that knowledge of OHS is not new to the ABLE SMEs. However, implementation is a challenge at both worker and management levels. To address this, separate sessions were arranged for the two groups to facilitate their understanding of the negative effects of not following OHS practices. The Activity team insists that OHS is put in place at every opportunity, and has noticed gradual improvements as a result.
5. ABLE SMEs considered some of the lessons given during the training programs not relevant to their specific needs, and that more practical work and less theory was needed. As a result The Activity has removed from the curriculum lessons that were not considered not useful and reduced the amount of theory taught. Further revisions also reflected the specialist needs of the workers in each area. Thus in Jashore sheet metalworking was not considered important and was removed from the curriculum, but it was kept in Bogura. These revisions reduced the length of training from 108 hours to 72 hours in Jashore and 78 hours in Bogura (the curriculum for foundry worker training stayed the same and its duration remains at 42 hours).

Workforce training in machining skills

In the second year of the Activity, following a competitive selection process, CSISA–MEA contracted training providers Thengamara Mohila Sabuj Sangha (TMSS) and Rural Reconstruction Foundation (RRF) to conduct the training of ABLE SME staff. A second competitive selection process awarded the next year’s contracts to RRF and Gram Unnayan Karma (GUK), a Bogura-based NGO. As in the previous year, CSISA–MEA staff worked closely with the contracted TSPs to develop training modules for trainers.





At the start of this reporting year, the Activity recognized that Chuadanga, Kushtia and Faridpur towns in the northwestern part of the Zol possess large numbers of ABLE SMEs. As these provide important services to machinery owners and farmers in the Zol, it was decided to expand training and technical support activities to these light engineering hubs. The training program was launched first, with kick-off meetings with selected ABLE SMEs in Jashore, Faridpur, Kushtia and Bogura in February and March 2022. These kick-off meetings briefed ABLE SME owners on the activities of CSISA–MEA and the support they could receive from the Activity. The Activity’s communications unit circulated a USAID-approved press release, securing coverage of the training events in five local and national newspapers.

From January to March 2022, the TSPs provided 60 staff from 20 ABLE SMEs in Bogura, 40 staff from 15 ABLE SMEs in Jashore and 20 staff from five ABLE SMEs in Kushtia with machinery manufacturing skills training. Training for Faridpur-based enterprises will be provided later in 2022.



*Above: Following CSISA-MEA facilitated training First Aid boxes such as the above have started to appear in ABLE SME workshops, this one is in a Bogura ABLE SME
Jonathan Colton, 27 March 2022*

Machining skills training outcomes

A pre- and post-training survey was carried out, based on 10 multiple-choice questions. The results show that before training, only 8% of the trainees could answer 50% or more of the questions correctly but that after training, 62% of trainees could answer 90% to 100% of the questions correctly. Trainees will also be re-tested six to eight months after training to assess how well they have retained the knowledge gained through this training.

Occupational health and safety training

All of the above training included occupational health and safety training. Each participant learned how to operate a fire extinguisher, the importance of PPE and how to use it, and how to respond to emergencies in the workplace. This included PPE for

COVID-19 safety as well as for the operation of manufacturing machinery. To equip participants with the means to put into practice the OHS training, CSISA–MEA provided all trainees with a set of PPE comprising a laboratory coat, welding shield,



goggles, safety boots, cap or safety helmet, gloves, mask and hand sanitizer. For many of the participating workshops and foundries, this was the first time that they had been exposed to structured and comprehensive OHS principles. OHS posters provided by CSISA–MEA and displayed by workshop management on the workshop walls encourage their workers to continue to follow good OHS practice. CSISA–MEA also arranged online live sessions on OHS during which experts from BARI’s Farm Machinery and Post-Harvest Division demonstrated the use of PPE.

Training provided to the foundry workforce by foundries

In the last quarter of 2021, CSISA–MEA initiated the novel idea of contracting leading ABLE SMEs to train the workforce of other ABLE SMEs. This approach not only uses the skills and experience already available within the light engineering sector, but also builds the skills of the ABLE SME workforce to provide training for their own staff and, as a business venture, for the staff of other ABLE SMEs. It also builds relationships between ABLE SMEs, which are anticipated to result in increased collaboration, networking and sharing of business skills. Post-training follow-up indicated that participants considered the learning experience more effective than that provided by TSPs, as training took place in real-time situations. In this reporting year, therefore, CSISA–MEA has continued to work with the same three leading foundries – Uttara Metal Industry, Jashore, and Kamal Machine Tools and Reza Engineers, Bogura – which had provided the skills training in 2021. The Activity also revised the curriculum and training manual it produced in 2021, employing technical expertise from foundry experts working for BITAC and academic institutes in Bogura. In the same location, 60 foundry workers are currently completing a 42-hour course in foundry skills, as part of training planned for 180 in the current Activity year (October 2021 to September 2022).

Skills assessment of the workforce to inform the design of a need-based training curriculum

To support ABLE SMEs to identify their strengths and weaknesses in their capacity to manufacture spare parts and machines, the Activity asked ABLE SME owners to complete a questionnaire that assessed their workforce skill level in terms of the manufacture of spare parts and machinery.

When assessed for all technical skills such as welding, milling, grinding, metal cutting and drilling, about 96% of the workforce was deemed unskilled. However, when it came to the skills needed for the work they are actually employed to do, the workforce generally had more knowledge. Only 21% were assessed as unskilled in their main tasks; 33% were considered by their employer to be skilled and 46% only moderately (averagely) skilled.



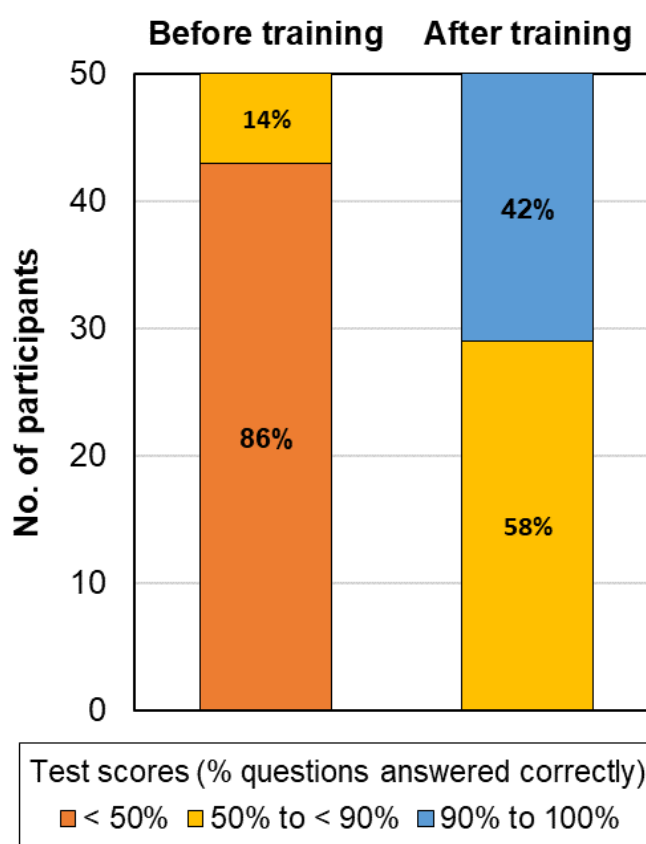
Skills assessment of workforce foundry skills

The Activity conducted an analysis of the skill level of the Activity's foundry workforce with respect to the skills needed to conduct their job, as well as any specific skill a worker is expected to have for their particular area of work. Foundry owners assessed their staff on a five-point rating scale. From a sample of 766 foundry workers, 764 workers were rated with a score of '1' and '2', which is considered unskilled. When the same workers were assessed for the skill they need to do their job, more than 31% were considered to be unskilled and 63% were considered to have only average skills. Only 6% of foundry workers were considered to be skilled in the work they are employed to do.

Training management staff in business-related concepts

Improving how equipment and facilities are arranged in the factory has been shown to be a way of improving efficiency in the workplace. At the same time, the Activity wanted to address the limited knowledge among ABLE SMEs of metal testing and certification procedures and protocols, that means they are not correctly measuring the quality of the raw materials they use. To provide ABLE SME owners with a workshop layout, metal testing skills, and knowledge of certification procedures and protocols, the Activity signed an agreement with the Farm Machinery and Post-Harvest Division of BARI in November 2021 to provide residential training in these subjects. The training was provided in January 2022 to 50 management staff from 39 ABLE SMEs.

The graph to the right depicts training evaluation scores of the participants. Before the training, 86% of the trainees answered less than 50% of questions correctly; afterwards all could answer more than 50% of the questions correctly and 42% could answer more than 90% of the questions correctly. The table below shows that many ABLE SME managers used their training to make major changes to their businesses.





Action taken by ABLEs following trainings facilitated by CSISA-MEA	Number of ABLEs
Installing safety equipment to ensure workplace safety and hanging of safety posters to educate the workers	17
Improving factory lay-out for a better production flow	16
Improving cleanliness and sanitation facilities ensuring good health of the staff	10
Procuring modern tools for precision in measurement leading to better quality of the product	9
Establishing inventory control and efficient book-keeping systems	8
Revising the delegation of roles & responsibilities of workers based on their skillset	8
Creating separate working spaces for women, building women toilets, engaging women in skilled work	5

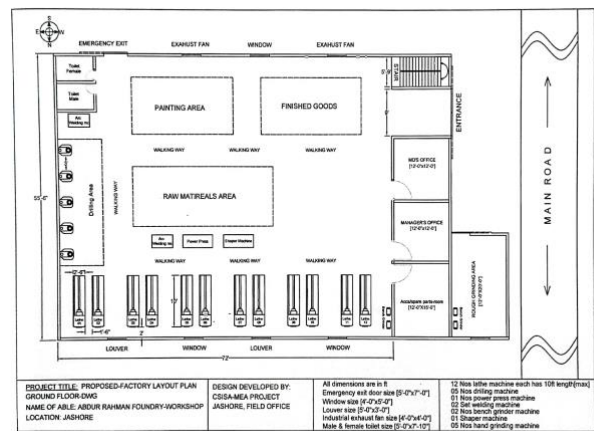


Above: Safety posters installed in and outside ABLE SMEs to raise occupational health and safety standards in, Bogura.
Photo: Jonathan Colton

The direct results of these training activities are an increased focus on occupational health and safety, environmental sensitivity (slag recycling and proper disposal, induction furnaces to replace coke-burring cupula furnaces), the provision of clean drinking water, facilities for women such as separate restrooms, and modern measurement instruments such as digital hardness metal testers and digital micrometers and calipers.



Above: Reza Engineering factory layout, devised as part of CSISA–MEA management training. Displayed on owner's office wall. Photo: Jonathan Colton



Above: Factory layout at A. Rahman Foundry, Jashore, co-designed with CSISA–MEA. Jonathan Colton

As a result of CSISA–MEA training and technical engineering support, Reza Engineering Ltd in Bogura and A. Rahman Foundry in Jashore are re-organizing their entire facilities, including the machine shop, metal-working shop and foundry, and are extending their ability to produce quality products in increased numbers. Reza Engineering Ltd is also adding a separate section that will employ women to do sand-casting mold preparation. This will include a women's restroom, changing room and childcare facilities.



Above: A CSISA–MEA engineer demonstrating a digital caliper, Mohammad Ali Engineering, Jashore, March 2022. Photo: Md. Khaleduzzaman



After participating in the Activity's management training, Kushtia Engineering Works (KEW) significantly upgraded its factory, raising and leveling the floor, installing brick flooring, installing concrete foundations underneath the machines, and spacing the machine tools to provide a safer and better work environment. KEW reports a happier and more productive workforce and increased profits, and is now one of the Activity's training providers.

Zone of Resilience

Following a series of kick-off meetings with ABLE SMEs from Cox's Bazar, Chattogram and Bandarban districts, the Activity signed agreements with 40 ABLE SMEs to train their workforce in basic machining skills through a 48 hour-long training program designed by CSISA-MEA engineers. The training will be conducted by the Ministry of Industry through its Chattogram BITAC office.

In Focus:

Using digital calipers to boost profits for Reza Engineering



Above: Md. Rezaul Korim, owner of Reza Engineers proudly displays his digital caliper.

Md. Rezaul Korim, owner of Reza Engineers and born in Bogura, took part in an Activity-facilitated management course at BARI, Gazipur in November 2021. The course explained why, despite the huge potential, the performance of the light engineering sector is below standard but that growth is possible if technological advancement and efficiency are ensured.

The training demonstrated the use of digital calipers and their significance in ensuring the exact measurement of spare parts, which helps reduce the

number of rejected parts. Following the training, Rezaul Karim purchased an INSIZE 6-inch digital caliper for his workshop. The management training also inspired Reza Engineers to design an improved workshop layout. The expansion of assembly industries combined with consistent growth in export-oriented sectors is likely to boost growth in the light engineering sector. "By using these digital slide calipers, I'll be able to reduce the quantity of rejected products, which will boost their business profit," Rezaul Karim stated.



Skills training for lead firm staff and dealers

In 2021, CSISA–MEA launched a [YouTube channel](#) featuring training videos in both Bangla and English to support the training of ABLE and lead firm engineers, technicians and workshop staff. Most importantly, a set of nine videos originally developed by trainers at Massachusetts Institute of Technology (MIT), USA and detailing important machine shop skills has been dubbed into Bangla and is used in conjunction with on-line learning activities provided by BARI. Lincoln Electric, a US-based, global producer of welding equipment provided videos on welding techniques and also supplied some welding posters, which have also been translated into Bangla by CSISA–MEA staff and printed by partner ABLE SMEs to hang on their workshop walls, allowing the workforce to better inspect their welds and assure their quality.



Above: Kushtia Engineering Works after renovations, Photo: Jonathan Colton.

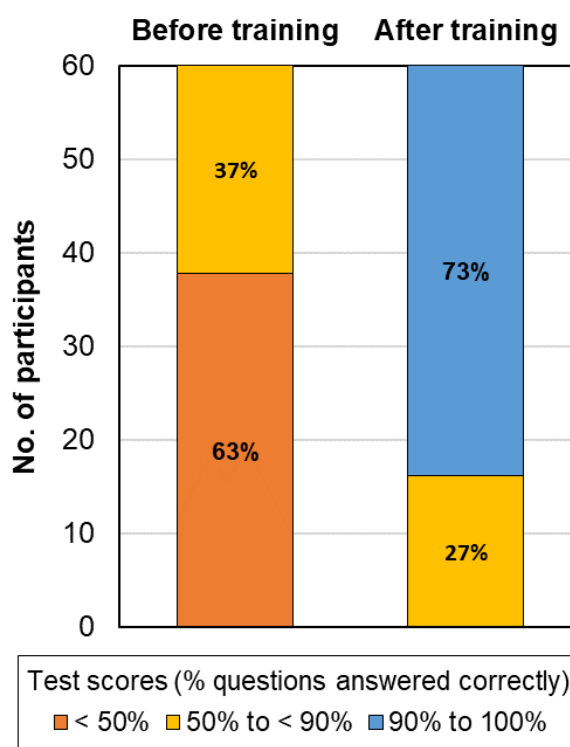
Through its collaboration with CSISA-MEA, Georgia Tech also provided Zoom-based training in May 2021 in three sessions live from Atlanta, Georgia, USA, for ABLE SME partners and CSISA–MEA institutional colleagues including BARI, BAU, BUET and BITAC. The topics covered included drawings, dimensions and tolerances, factory facility design and layout, the



costs and economics of manufacturing, and manufacturing systems. These educational opportunities have helped raise engineering quality levels, as well as exposing CSISA–MEA partners to new topics and supporting them to improve their factories and business income.

Providing women with training to improve their skills and working conditions

Women are employed in foundries in Bogura and Greater Jashore to carry out unskilled, low-paid work, such as sorting and carrying raw materials and cleaning the workshop. CSISA–MEA conducted a survey of partner ABLE SMEs to determine the appetite for employing women and the reasons why they would or would not want to do so. Of the 64 ABLE SME owners surveyed, 49 (75%) were more than open to employ women, reasoning that women, although not always for reasons of empowerment. Stated reasons for interest in employing more women included the perceptions that women would be willing (1) work for lower wages, (2) 'have better attendance', and (3) are more diligent than men. Those ABLE SMEs not wanting to employ women cited their limited facilities, such as a lack of separate working spaces for women and separate restroom facilities that prohibit considering employment.



Of the occupations that the Activity identified as being ones that women could perform, the most appropriate were painting, and grinding and fettling, which are less arduous than many engineering tasks and do not involve heavy and dangerous machinery. The Activity then designed a short course for women in spray gun painting, and a two-day course on grinding and fettling, facilitating the training of 60 women. The graph above presents the women's training evaluation scores. Before the training, 63% of participants answered fewer than 50% questions correctly, which increased to 73% of them answering more than 90% of the questions correctly after the course.

Online training sessions engaging women and youth

In partnership with the Farm Engineering and Post-Harvest Division at BARI, the Activity organized 13 one-hour online live training sessions on lathe operation, drilling, milling and jig



operation, and OHS. The training engaged members of the ABLE SME workforce from Greater Jashore and Bogura every day for four weeks. As participants could practice what they watched during the session, this on-line training approach was thought to have had a strong and immediate impact on their skills. CSISA–MEA provided a laptop, LCD projector, speakers, display screen and stand, WIFI router and Internet top-up to each of the 12 ABLE SMEs participating in the training (although workers owning a smartphone could watch classes on their phones, they generally preferred to do so in groups on a big screen). In these trainings, there were between 75 and 150 participants (65% youth, 12% women) at each of the 13 sessions.

In Focus:

Nilafur pushes for gender equality in Bangladesh's light engineering sector

Nilafur Begum, now aged 30, passed her Higher School Certificate when she was 18. Soon after that she married Rezaul Karim, owner of a light engineering workshop in Bogura. Nilafur's ambition was to do further studies, go out into the workplace and make her own money but instead she works with Reza managing the business. She is responsible for inventory management, marketing and business finance management.



Above: Nilafur Begum has become an advocate for women in light engineering. Photo: CSISA-MEA.

CSISA–MEA organized finance and business management training at BARI and Nilafur was one of the participants. With the confidence these new and enhanced skills gave her, she went back to the workshop and introduced a computerized finance management and stock management system. Nilafur also established a dedicated restroom for female employees.

Nilafur said, "We had no idea what a good source of strength women workers would be for the factory if we could provide them with adequate facilities – and that by doing so, we could create jobs for many women who really need them." Her current priority is workshop safety and occupational health, again utilizing knowledge learned through the CSISA–MEA training. She showed proudly displays OHS posters and maintains a list of workshop rules. "I used to think I wasn't cut out for light engineering because it's primarily male-dominated," she said, "but I was mistaken. This industry has a lot to offer women, and I'm excited at the prospect of hiring more women experts."

Training this number of learners using a conventional classroom training approach would have cost approximately USD \$25,000, which compares favorably with the cost of the 12 sets of online equipment which was approximately USD \$15,000. The on-line approach also gave participants access to training by leading scientists from BARI. It also provided the public



sector, in the form of BARI, with the opportunity to reach light engineering industry workers with their expertise.

Self-learning training program for youth

A survey of social media usage among ABLEs conducted by CSISA- MEA in 2021 found that 47% of the workforce owned a smartphone and a further 13% had access to a smartphone through friends and family. However, it was also found that the phones were only used to access entertainment and not work-related videos. To better utilize this resource, CSISA–MEA staff have been helping members of the ABLE SME workforce to install the WhatsApp application in their smartphones and created self-learning groups. There are now up to 369 members in four CSISA–MEA WhatsApp groups. The Activity has connected the WhatsApp groups to the CSISA–MEA YouTube channel, and created a self-learning platform which can be accessed through a video link posted every week. Workers are encouraged to watch the machining skills videos and answer the subsequent questions.

Intermediate Result III: Enhance farmer access to mechanization and other crop production and marketing services with particular emphasis on remote and underserved markets

Intermediate Result III



State of adoption and dis-adoption of agricultural machinery in the Zol and ZoR

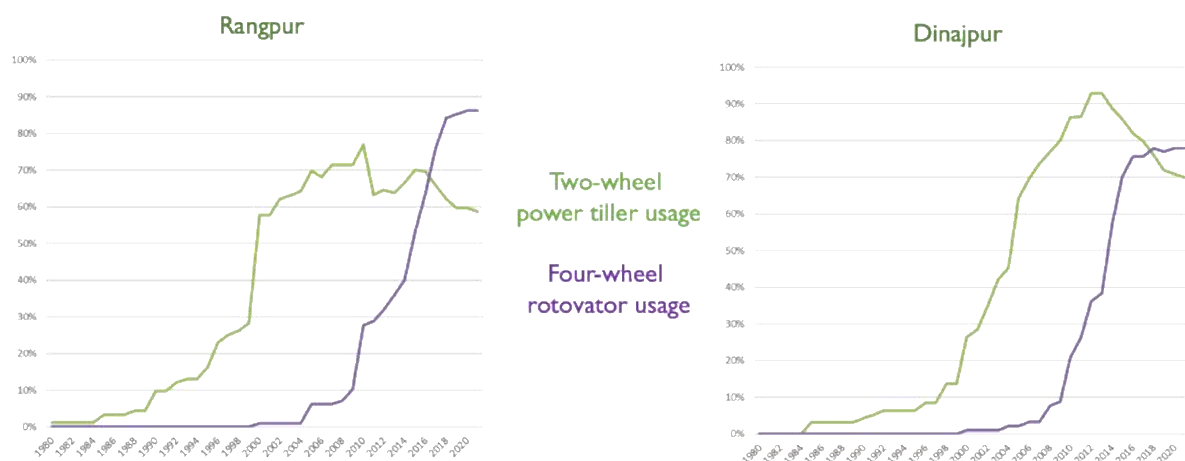
During the reporting period, the Activity conducted a random sample survey to determine to what extent farmers are adopting new agricultural mechanization technology such as combine harvesters and tractors, and what is constraining further adoption of this technology. The survey reviewed the status of 26 types of distinct machinery introduced to Bangladesh in recent years. These include two- and four-wheel tractors, tractor-mounted planters, rice transplanters, irrigation pumps including solar pumps, harvesting equipment including reapers, and combine harvesters and post-harvest equipment such as threshers, shellers and fodder choppers, among others.



The results suggest that machinery use is limited not just by availability, but also by farmers' limited knowledge of their functions and even of their existence. Adoption of many types of technology is therefore not only constrained by their cost and relevance to the farmer or availability of the machine, but also by a lack of up-to-date information. Most farmers would not typically consider owning a machine, though availability of subsidies makes it more likely they would consider buying a machine. Use of machines will therefore continue to be based on the hiring of machinery services provided by the small minority which own machines, as has been popularized by CSISA-MEA and CSISA-MI before it. Adoption of some of the more expensive machinery such as combine harvesters and tractors will therefore depend on machinery marketing companies finding those few individuals with the resources to purchase a machine, helping them source finance to enable to make the purchase and providing farmers with information about the machines and the MSPs.

Supporting MSPs to maintain and use agricultural machinery

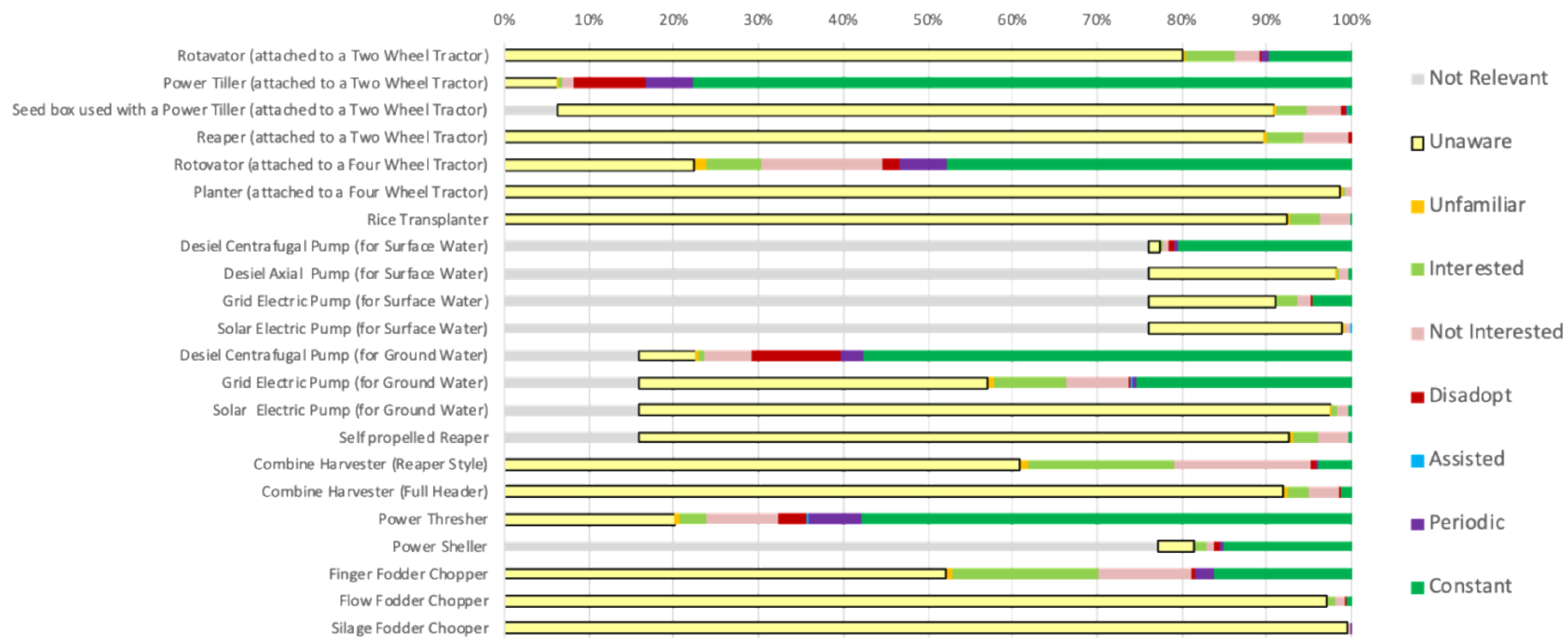
For MSPs to be able provide farmers with a wide range of cost- and labor-saving machinery services, they and their farmer clients need information and training in the use and value of this technology. They also need to have access to dealers close to home, with bank finance available when needed. To keep machines operating, MSPs need to be confident in their operation and maintenance, be able to buy spare parts easily, and have access to mechanics trained in how to repair them. If a machine breaks down because an MSP has not been shown how to use or maintain it, or does not have access to the services of a trained mechanic and a supply of spare parts, it will lie idle, instead of providing farmers with the mechanization services they require, in a timely manner. This intervention therefore aims to support lead firms and MSPs to address these issues.



Above: Change in the percentage of farmers using two-wheel and four-wheel tractors from 1990 to 2021 in Rangpur and Dinajpur districts, northwestern Bangladesh. Data taken from a survey of 1,000 farmers in 20 upazilas in 10 districts spread across the ZoI, ZoR and selected districts in northwestern Bangladesh.



*The Feed the Future Cereal Systems Initiative for South Asia
Mechanization and Extension Activity Semi-Annual Report, 2021-2022*



Above: The diagram shows the level of adoption of 16 different types of agricultural machinery from a survey of 1,000 farmers in 20 upazilas in 10 districts spread across the ZoI, ZoR and selected districts in northwestern Bangladesh.



The survey found that four-wheel tractors were starting to replace two-wheel tractors and that this was most evident in north-western Bangladesh. However, the main finding was that adoption of newer technology like combine harvesters was constrained not just by availability but also by farmers' limited knowledge of their functions and even of their existence. Adoption of many types of technology is therefore not only constrained by their cost, relevance to the farmer or availability of the machine but also by a lack of up-to-date information. Most farmers would not consider owning a machine, though availability of subsidies makes it more likely they would consider buying a machine. Use of machines will therefore continue to be based on the hiring of machinery services provided by the small minority which own machines. Adoption of some of the more expensive machinery such as combine harvesters and tractors will therefore depend on machinery marketing companies finding those few individuals with the resources to purchase a machine, helping them source finance to enable to make the purchase and providing farmers with information about the machines and the MSPs.



Above: Lead firms providing technical training for the mechanics, November 2021. Photo: Apurba Dubey

Training company engineers, mechanics and MSPs in the use of combine harvesters and rice transplanters

Combine harvesters are complex machines that need to be carefully maintained and operated with skill, to prevent frequent breakdown and the resulting lack of operational combines during the critical rice and wheat harvesting seasons. To reduce breakdowns, in 2021 CSISA–MEA supported three combine harvester marketing companies to train mechanics to maintain and repair combine harvesters, and combine harvester operators to use and maintain them.



This work continued in both the Zol and ZoR in 2022. In the Zol, lead firms TML, Abedin Equipment and ACI Motors, in partnership with CSISA–MEA conducted 124 pre-season maintenance campaigns, trained 55 mechanics in combine harvester maintenance, and 40 combine harvester owners and operators in combine harvester use and maintenance.

Mechanical transplanting of rice seedlings is another new technology that has become available to farmers in Bangladesh over the last three years. The use of rice transplanters dramatically reduces labor requirements for transplanting rice, but requires more care and labor for raising seedlings than manual rice transplanting. CSISA–MEA has been supporting lead firms which import mechanical rice transplanters, as well as regional seed companies marketing rice transplanter services, to market rice transplanters and train MSPs and farmers in how to use them. In the Greater Jashore region the Activity has partnered with three regional seed companies (Ali Seed Farm, Jashore, Konica Seed Company (Pvt.) Ltd, Chuadanga and UOMCSL, Narail district) to promote rice transplanter use.



Above: video explaining rice transplanter use, broadcast on local television in a tea shop, 20 March, 2022. Photo: Mominul Islam



Above: Rice transplanter operators, training to raise rice seedlings, 9 January, 2022. Photo: Md. Matinur Rhaman



The approach taken by these seed companies has been to develop a partnership facilitated by CSISA–MEA with the Activity’s three lead firms selling rice transplanters (TML, ACI Motors and Abedin Equipment), as part of which, the seed companies agreed to market transplanters on behalf of the lead firms, and, jointly with the lead firms, to provide training in raising rice seedlings for MSPs and farmers, and training for mechanics and rice transplanter operators. The seed companies also agreed to link MSPs with the DAE to facilitate access to subsidies to purchase rice transplanters, and to conduct demonstrations in collaboration with DAE. The lead firms’ side of the agreement is to ensure that dealers in the neighborhood where rice transplanters are operating will stock spare parts for rice transplanters.

To date, the partnership between seed companies and lead firms has resulted in the training of 110 farmers (28 women) as entrepreneurs raising seedlings, demonstrations on fields of 198 farmers (13 women) covering a total of 27 hectares, and 22 farmers’ field days with a total of 971 participants (130 women). Konica Seed Company and ACI Motors also provided training in rice transplanter use for 10 ACI rice transplanter customers and rice transplanter repair and maintenance training for 10 mechanics.



Above Farmers and rice transplanter service providers in Whykong, Teknaf, Cox’s Bazar district are excited about the opportunities for cost savings and increased profitability to be brought by rice transplanters..



In Focus:
Expanding appropriate mechanization in the Zone of Resilience

Ali Ahmed, a 22-year-old undergraduate student from Teknaf upazila, Cox's Bazar and Mosharof Hossain (55) from Lama upazila, Bandarban district, focal areas for USAID-financed activities. Ali and Mosharof have both become pioneers in mechanized farming, as the first in their neighborhood to buy and operate commercially rice transplanters. Both Ali and Mosharof found it hard to find the necessary labor for planting and harvesting, and so each decided to buy a rice transplanter from a CSISA–MEA partner lead firm, TML.



Above: Ali Ahmed, undergraduate farmer, using a rice transplanter, Teknaf, Cox's Bazar district, January 2022. Photo: Mahajabin Khan



Above: In Bandarban district, Mosharof's rice transplanter is at work, increasing his skills as a new entrepreneur, January 2022 Photo: Mahajabin Khan

The partnership provided training in raising seedlings for use with a rice transplanter, and how to operate and maintain a rice transplanter. In 2022, Ali and Mosharof hired out their services, using their transplanters to plant boro rice for neighboring farmers, with considerable success. Ali said, "I started with just eight hectares [of work], but I intend to expand to 30 hectares by next season – and I want to do major things with this machine in the near future."

Mosharof said, "I've had an order to plant seedlings on five hectares of land," adding, "I expect this to expand next season. Hill tract soil is quite suitable for using a rice transplanter – and if I get support, I'll buy a combine harvester as well."



In Faridpur, INSAF Seed Company provided training for all 15 of its staff on how to raise rice seedlings, and went on, by provide training in rice seedling production, to establish 80 farmers (including 55 women) as entrepreneurs in raising rice seedlings. It also trained 10 MSPs as rice transplanter operators and 12 mechanics as rice transplanter maintenance mechanics. It also marketed its rice transplanting services through 15 farmers meetings, which were attended by a total of 440 farmers (including 111 women), 11 demonstrations and posters, banners, and a video aired on local cable television. This generated business for transplanting 60 hectares of rice worth USD \$5,960. To stimulate the market for next season, INSAF organized three field days for farmers and government extension staff, which had a total of 190 attendees. Finally, in the ZOR, 19 rice transplanter MSPs took part in training provided by TML and ACI Motors, learning how to operate the rice planter and how to raise rice seedlings to plant out using the machine.

Private sector expansion and training of machinery salesforce staff

A hurdle faced by many lead firms in their attempts to reach new agricultural machinery and spare parts customers is the lack of a trained salesforce. To address this, and to provide a pathway towards the inclusion of women and youth in the sector, CSISA–MEA facilitated a meeting during the reporting period between lead firm ACI Motors and 15 potential sales agents (five women, nine youths and one combine harvester MSP) in Faridpur. Each attendee signed an agreement with ACI to act as commission-based sales agents dealing in combine harvesters, rice transplanters and spare parts.

After training by ACI Motors in the machinery it sells, they earn a small commission on each sale they facilitate. MSPs also need support to promote their services. In the ZOR, the Activity supported 20 MSPs to each hold a business development event and advertise their work. These events attracted 812 farmers (including 63 women). CSISA–MEA provided technical support by helping the MSPs to create promotional materials including banners, business cards and signboards.

In the ZOR, combine harvesters, reapers and rice transplanters are comparatively new technologies. To support the Activity's machinery marketing lead firms TML, ACI Motors and Abedin Equipment to promote the use of these machines, CSISA–MEA facilitated 19 marketing events attended by 526 farmers. This and other linkage events resulted in the sale of 14 combine harvesters, 10 rice transplanters and 4 reapers during this 6 month reporting period in the ZoR. In addition these linkage events have resulted in applications for government subsidies in the ZoR for the purchase of a further 19 combine harvesters, 12 rice transplanters and 19 reapers. It is likely that these subsidies will be issued and sale completed in May 2022.



Collaborating with other USAID implementing partners to facilitate new agricultural machinery technologies for maize and livestock farmers in the ZoR

Fresh maize cobs are a favorite snack of the Rohingya refugee and host communities of Teknaf and Ukhiya *upazilas*. Not surprisingly therefore, the arrival of the Rohingya community in large numbers in 2018 led to a big increase in the demand for fresh maize cobs in Cox's Bazar district, which in turn resulted in a large increase in the area planted with maize. Maize suitable for fresh green maize cobs is harvested a month before crop maturity, when the leaves and stem of the plant is still green and makes good livestock fodder. However, it remains suitable for livestock fodder for only about two weeks, after which it must be preserved as either hay or silage. Silage production as a practice has yet to be introduced into the Cox' Bazar region.



Above: (left) LPN and CSISA–MEA staff training farmers to make silage; (right): Compressing chopped maize leaves into a plastic bag as part of the silage making process, Hnila, Teknaf, Cox's Bazar, March 2022. Photo: Ashraful Alam

In response, CSISA–MEA and the USAID Feed the Future Bangladesh Livestock Nutrition Activity have teamed up to build machinery and service markets for silage-making. To make silage, the fodder has to be cut into bite-sized pieces that livestock can feed on more efficiently and which can be used to make silage. To do this, mechanical fodder choppers are being marketed by dealers in Cox's Bazar with support from CSISA–MEA and LPIN. This collaboration has resulted in five entrepreneurs setting up business to make silage, and is the result of action research with maize farmers and machinery dealers, as described below.



Dual-purpose maize production in South-West Bangladesh

Around Hnila union in under Cox's Bazar, the area of maize production is currently ca. 100 ha only. Compared with the rest of Bangladesh where most maize is harvested as grain for use in livestock and fish feed, in Teknaf Upazilla in the USAID ZoR maize is harvested before it is mature as green cobs for consumption as roasted/boiled maize in the winter by Rohingya camp refugees and Teknaf farmers. As the maize is harvested before it is mature the stems and leaves are still green and rich in proteins and sugars making them excellent livestock feed. To enable cattle to use the fodder from maize efficiently it needs to be chopped up into small bite sized pieces. Normally work for the women members of the family this is very laborious. In recent years machines, initially manually operated from India but more recently electric and diesel engine powered machines made in Bangladesh including by light engineering businesses in the USAID Zol have been introduced. These machines can do in five minutes what it would take the farmer up to an hour if chopping fodder by hand. These machines had not been widely available in Cox's Bazar District of the ZoR until CSISA-MEA began supporting companies from the Zol establish dealerships and market fodder chopping machines in the ZoR.

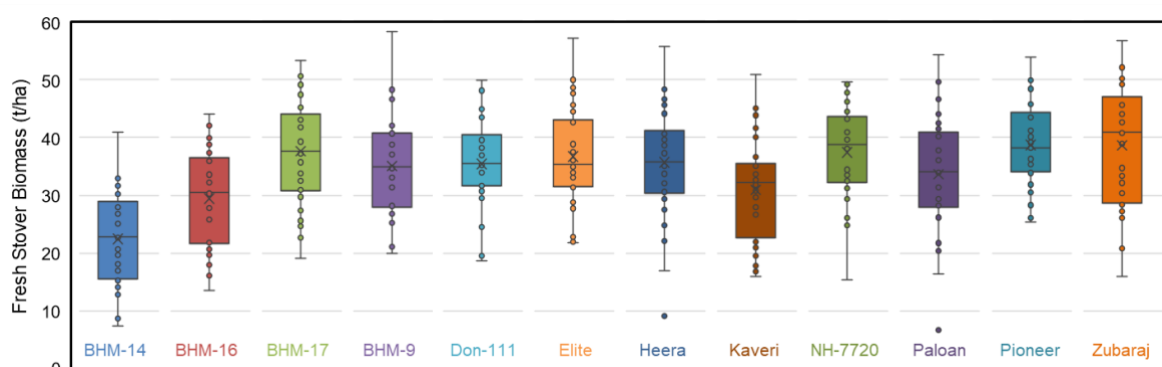
Fodder shortages for livestock are common during the summer season (pre-monsoon season from March to June), taking advantage of the by-product of green maize cob production is a compelling opportunity to increase efficiency in the current cropping system in this part of Bangladesh. To support farmers take advantage of this opportunity CSISA-MEA, as well as facilitating the marketing of fodder choppers has been supporting the mechanization of rice transplanting and harvesting. This allows for faster planting, quicker crop establishment and earlier and faster rice harvesting. This, combined with machine of maize with a power tiller operated seeder can aid in earlier maize establishment of maize crops and consequently farmers' earlier access to the lucrative maize cob harvest and the much-needed maize fodder.

The fodder a maize crop could produce is much more than cattle can consume before the plants dry out in the field. If a way of preserving the crop is not used the farmer would either have to sell the maize fodder or lose this valuable resource. One way of preserving maize leaves and stems is to make it into silage and to do that it needs to be chopped into small pieces which again requires the use of a fodder chopper. In a partnership with the USAID FtF Bangladesh LNA, training for dairy farmers in silage production by this activity has been linked to facilitation by CSISA-MEA to marketers of mechanized fodder chopper selling companies, becoming an important collaboration program for these two USAID activities. As can be seen from the table below, the production of green fodder and silage can be particularly profitable. On a typical 0.1 ha plot of maize in addition to the 6'000 to 8'000 green cobs ~2.5 tons of silage worth US \$250 could be produced. In response, the Activity has been drawing on its maize research expertise to identify which of the most common commercially available maize



hybrids in Bangladesh would make the best green maize cob and fodder producing hybrids for Cox's Bazaar district in the USAID ZoR.

Production (ton/ha)		Monetary value (BDT/ton)		
Green stover	Silage	Green stover (entire plant)	Green stover (chopped)	Silage
30-40	24-32	500-1,000	5,000	8,000



Above: Comparative yield (tons/ha) of fresh stover from 12 maize hybrids grown in a replicated trial carried out on 10 field each in 3 villages of Hnila Union, Cox's Bazar (N=30 farmers).

Examples of impact

Abul Hossen, a maize growers and livestock owner who collaborated with CSISA-MEA with in Hnila, reported hiring 1 labor force a day only for the fodder provision (cut, carry and chopping) of his 15 head of cattle last year. In October of 2021, he bought a fodder chopper sold from RK Metal in the ZoI, through a distributor in the ZOR, after having seen it demonstrated at a field day organized under CSISA-MEA. He estimates having already saved USD \$288 in labor costs since buying the fodder chopper in early February; and an additional USD \$23 per month in fodder as he observes far less waste since feeding chopped fodder. Adding sales of chopped green stover (~450 kg) and silage (~1.5 tons) Abul Hossen can proudly claim to have has already recovered the USD \$402 he invested into buying the fodder chopper October of 2021.

Linking value chain actors: lead firms, dealers, MSPs and farmers

The ZOR is new business territory for machinery marketing lead firms, where they have no established offices or dealers. To be able to effectively market new machinery technology such as combine harvesters, the firms need to establish partnerships with ZOR-based machinery dealers. To facilitate market development, CSISA-MEA supported TML, Abedin



Equipment and Alim Industries to meet dealers, as a result of which they established partnerships with three dealers.



Above: Abul Hossen and his wife, proud owners of a Zol manufactured RK Metal fodder chopper. Photos: S. Cheesman.



Above: Maize silage and rice straw as cattle fodder. Photos: S. Cheesman.

Support to MSPs to facilitate business expansion

A growing number of start-up companies are linking farmers through a network of village-based agents with input supply lead firms and food processing companies. MSPs being largely village-based have a wide range of networks which could be used to expand the services they provide to farmers, beyond just machinery services. Through partnerships CSISA–MEA has established with two of these startup companies (bhalo Social Enterprise and iFarmer) the Activity aims to broaden the services that MSPs can provide farmers, by either engaging them as agents for these companies or linking them with the company agents so that the agents can offer farmers machinery services as well as input supply and crop purchasing services.

In Jashore, CSISA–MEA supported bhalo Social Enterprises to conduct a survey of MSPs, retailers, and seed and pesticide dealers, in order to identify individuals who would make good sales agents (*'bhajians'*). To date, bhalo has identified four potential *bhajians* and trained them about products sold by partners and lead firms, including ACI Godrej, NAAFCO, Auto Crop Care, Lal Teer Seed Ltd, Jahid Mills, and Hasan Flour Mills. It has established four bhajan outlets in three upazilas which have already begun selling agricultural inputs and machinery services to farmers, who they also provide with technical advice. This has resulted in a weekly turnover of business worth USD \$1,400 at the time of writing.



iFarmer provides farmers and the food industry with an agricultural finance and supply chain platform which improves production and access to finance. It links agricultural producers and processors with financial institutions, input suppliers, and provides advisory services through an App called Sofol, which was developed by iFarmer. With support from CSISA–MEA, iFarmer collects MSP and farmer data using the Sofol app.

To raise awareness regarding its services, and with support from CSISA–MEA, iFarmer onboarded 95 MSPs to work with farmers directly and plans to reach out to 100 potential MSPs by September 2022. Data for these additional potential MSPs will be uploaded to the app and, once deemed interested and capable, will be assessed for training and financial requirements. iFarmer uses the data it collects to track and monitor industry information, provide links with input suppliers and financial institutions, and share information with farmers and MSPs. The collection of data allows iFarmer to better understand the needs of farmers and provide appropriate services.

During the reporting period, data were collected and uploaded on to the app for a total of 35 MSPs and 2,447 farmers. In addition to the data collection, CSISA–MEA assisted iFarmer in the organization of a meeting with six MSPs to conduct a needs assessment for crop-based training and financial requirements.

The bottom line – what all this work has achieved in terms of machinery sales: Through this intervention, six lead firms (The Metal Pvt. Ltd, ACI Motors, Abedin Equipment, Janata, Alim Industries and RK Metal) received support from CSISA–MEA for the sale of machinery (including combine harvesters, rice transplanters, PTOS, and thresher machines) to MSPs. To assist in the purchase of the machines, CSISA–MEA supported the MSPs to obtain government subsidies and establish connections with appropriate lead firms. During the reporting period, a total of 131 MSPs in the ZOI together bought 119 combine harvesters, one mini combine harvester, nine reapers and two rice transplanters, together worth USD1,948,673. In the ZOR, 22 LSPs bought a total of eight combine harvesters, four reapers and 10 rice transplanters, together worth USD120,449

Communications and outreach

CSISA–MEA has used SMS messaging, messenger groups, social media, blogs and newspapers to communicate the activities and achievements of the Activity to a wide audience. These are detailed below:

- CSISA–MEA has published a [trifold brochure](#) to distribute among the private sector, government officials, donor and partners.
- A workshop on “Agricultural Mechanization In Bangladesh –The Future” (21–22 March, 2022) by CSISA–MEA in collaboration with BAU. Several national media representatives took part in this event and the discussion was covered by two leading newspapers. The



following are links to coverage of the activity: [Dhaka Tribune](#); [Daily Star](#); [Business Post](#); [Daily Sun](#); [The Financial Express](#); [Agrinews24](#); [Agrinews24](#); [Prothom-alo](#); [Jagonews24](#); [Sarabangla](#); [Swadesh](#); [Manob-jomin](#); [BTV](#)

- News about CSISA–MEA activities has been published several times on the USAID Bangladesh official Facebook page: [First mechanization in hill tracts](#); [Online training for Light Engineering Workforces](#); [Agricultural mechanization in Bangladesh – The Future](#)

Challenges encountered during the reporting period

COVID-19 risks continued to be a challenge during the reporting period, with the rise of the OMICRON variant in late 2021 causing a number of key staff to fall sick and work from home. The Activity has also experienced challenges in accessing Bandarban, within the ZoR, given the extensive amount of governmental permissions required for foreign experts to work there. Efforts are however underway to rectify this situation. Aside from these concerns, the Activity was largely unencumbered by significant challenges in the reporting period.



Annex I: Detailed information about Activity implementing partners



The International Maize and Wheat Improvement Center (also known as *Centro Internacional de Mejoramiento de Maíz y Trigo*, or CIMMYT by its Spanish acronym) is the Activity's prime. In addition to being responsible for the overall administration and financial management of the Activity, responsible for employing field staff with agricultural development and engineering skills. CIMMYT is also responsible for reporting to the donor on progress of the Activity, lessons learnt through its implementation, and its impact. For this it employs a Monitoring, Evaluation and Learning (MEL) team that collects monitoring data, conducts surveys to evaluate Activity progress and conducts internal data quality assessments (iDQA) to ensure the data reported to USAID is accurate. CIMMYT is also responsible for maintaining and administering field offices (see below for their locations). From these offices, CIMMYT and iDE field staff design, implement and supervise the training and technical support given to MSMEs in the light engineering sector, to machinery service providers (MSPs) aka LSP and machinery dealers, and to the farmers. This work is done in partnership with the Government of Bangladesh and the private sector.



International Development Enterprises (iDE) was a partner in the implementation of the CSISA–MI Activity and is a key implementation partner for CSISA–MEA, where its responsibility is to design and implement market-driven interventions in partnership with private sector firms. Within this CSISA–MEA, iDE plays a pivotal role in facilitating partnerships between SMEs and larger firms for process, technology and market improvements, and in leading the financial inclusion component with a range of national and international partners.



Georgia Institute of Technology (Georgia Tech) is CSISA–MEA's core engineering adviser and educational partner. In the USA, Georgia Tech provides a technologically focused education to undergraduate and graduate students in fields ranging from engineering, computing and sciences to business, design and the liberal arts. Within CSISA–MEA, Georgia Tech is leading efforts in the mechanization and industrialization activities and in the design and implementation of the apprenticeship program, as well as anchoring US-based industry collaborations.



Annex 2: CSISA–MEA staff overview

CIMMYT	No. of posts	iDE	No. of posts
<i>Dhaka Office</i>			
Project Leader*	1	Team Leader*	1
Project Manager (interim)	1	Project Manager	1
Senior Agronomist* [@]	1	Senior Technical Specialists	2
Associate Scientist * [@]	1	Intervention Manager	1
Post-Doctoral Fellow, Cropping Systems *	1	Specialists Evidence & Analytics	1
Field Team & Private Sector Engagement lead*	1	MSA consultant	1
Lead Training Coordinator*	1		
Training Coordinator	2		
MEL Manager† (interim)	1		
Communication Coordinator	1		
MSME Market System Development Coordinator	1		
Project Administrator	1		
Research Coordinator	1		
International consultants* - 1	3		
Locally recruited consultants – 1	4		
Total Dhaka office	21	Total Dhaka office	7
Field Offices (Jashore, Faridpur, Cox's Bazar and Bogura)			
Field Office Coordinator	4	Field Office Coordinator	1
Agricultural Development Officer	7	Market Development Specialists	2
Machinery Development Officers (engineers)	10	Officer, Market Development	10
Senior MEL Officer	3		
Admin & Finance	3		
Total field offices	27	Total field offices	13
Total employed by CIMMYT	48	Total employed by iDE	20

*Internationally recruited staff



Annex 3 Agricultural mechanization workshop agenda



*The Feed the Future Cereal Systems Initiative for South Asia
Mechanization and Extension Activity Semi-Annual Report, 2021-2022*


FEED the FUTURE
U.S. Developmental Global Hunger & Food Security Initiative

Agricultural Mechanization in Bangladesh – The Future

21st and 22nd March 2022
 Grand Ballroom, Pan Pacific Sonargaon, Dhaka, Bangladesh

Sessions will be broadcast live on Zoom for participants unable to attend in person.
Zoom link: <https://us02web.zoom.us/j/7087547517?pwd=cXQ2SElCbStya09qeHhJOHRiTWNaZz09>
Meeting ID: 708 754 7517; Passcode: 534932

Day 1 - Morning

Registration: (08:00- 08:50)
Inauguration Session: (09:00-11:30)
Session Chair: Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, Bangladesh Agricultural Research Council (BARC)
 Welcome and Overview of workshop objectives and sessions plan (20 minutes): (Dr. Timothy J. Krupnik, Country Representative, CIMMYT Bangladesh and Prof. Dr. Md. Monjurul Alam, Department of Farm Power and Machinery, BAU)
Speech by Special Guest (10 minutes) - Mr. Md. Sayedul Islam, Secretary, Ministry of Agriculture
Speech by Chief Guest (30 minutes) - Dr. Muhammad Abdur Razaque, MP, Minister, Ministry of Agriculture
Speech by Director General, BARI (10 minutes) - Dr. Debasish Sarker, Director General, Bangladesh Agricultural Research Institute (BARI)
Speech by Director General, DAE (10 minutes) - Mr. Md. Benojir Alam, Director General, Department of Agricultural Extension (DAE)
Speech by Director General, BVWMRI (10 minutes) - Dr. Golam Faruq, Director General (Current charge), Bangladesh Wheat and Maize Research Institute (BVWMRI)
Speech by Director General, BRRI (10 minutes) - Dr. Shahjahan Kabir, Director General, Bangladesh Rice Research Institute (BRRI)
Speech by the USAID Bangladesh Official (10 minutes) - Dr. Muhammad Khan, Acting Director, Office of Economic Growth (USAID)
Speech by the Chair: (10 minutes) - Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, BARC

Tea Break and Snacks

Session 1 (12:00-13:00): Agricultural mechanization in the context of economic development in Bangladesh)
Session Chair - Dr. Debasish Sarker, Director General, Bangladesh Agricultural Research Institute (BARI)
 12:00 - 12:25: How Bangladesh is transforming from a predominantly agro-based to a vibrant agro-industrial society? The role of agricultural mechanizations:
Keynote presentation: Dr. Shahidur Rashid, Director for South Asia, IFPRI and Dr. Xiaobo Jhang, Senior Research Fellow, IFPRI
 12:25 - 12:50: Achievements and future plan for agricultural mechanization in Bangladesh.
Keynote presentation: Mr. Md Benojir Alam, Director General, Department of Agricultural Extension (DAE).

Lunch and Prayer

Day 1 - Afternoon

Session 2 (14:00-17:00): What have we learnt about adoption of agricultural mechanization?
Session Chair: Prof. Dr. Lutful Hassan, Vice-Chancellor Bangladesh Agricultural University (BAU), Mymensingh
 14:00 - 14:25: The adoption, dis-adoption and constraints to further adoption of new agricultural machinery in Bangladesh.
Scene setting presentation: Dr. Brendan Brown, Socio-economist, CIMMYT, South Asia
 14:25 to 14:50: Adoption and adaptation of pre & post harvest rice farming technologies: Bangladesh experience
Scene setting presentation: Dr. Md. Monjurul Alam and Dr. Chayan Kumar Saha, Professor, Department of Farm Power and Machinery, BAU
 14:50 to 15:15: Mechanisation in South East Asian countries with rice based farming systems.
Scene setting presentation: Dr. Martin Gummert, Senior Scientist - Postharvest Development, Sustainable Impact through Rice Based Systems, IRRI
 15:15 - 15:40: Mechanisation in South Asian countries with rice based farming systems
Scene setting presentation: Dr. Avinash Kishore, Research Fellow, IFPRI
 15:40 to 16:05: The role of Public Private Partnerships (PPPs) in the rapid transfer of agricultural machinery technology to farmers - Public Sector Perspective
Scene setting presentation: Dr. AKM Saiful Islam, Principal Scientific Officer (PSO), BRRI
 16:05 to 16:30: The role of Public Private Partnerships (PPPs) in the rapid transfer of agricultural machinery technology to farmers - Private Sector Perspective
Scene setting presentation: Dr. F H Ansary, President, ACI Agribusiness Division and Managing Director, ACI Motors Ltd. and Mr. Subrata Ranjan Das, Executive Director, ACI Motors

Tea Break and Snacks

17:00 to 18:00: Panel discussion on presentations made in session 1 and 2
Moderator: Prof. Dr. M.A. Sattar Mandal, Emeritus Professor in the Dept. of Ag. Economics & Former Vice-Chancellor of Bangladesh Agricultural University, Mymensingh (BAU). Form Member of Planning Commission (Gen. Econ.: Agriculture), Govt. of the People's Republic of Bangladesh.
Panellists:
Government representatives: Sheikh Md. Nazimuddin, Coordinator, Agri. Machinery Development Assistance Cell, Field Service Wing, Department of Agricultural Extension (DAE)
Industry representatives: Mr. Sadid Jamil, Managing Director, The Metal (Pvt.) Limited
Research institutions: Dr. Israel Hossain, Ex. Director General, BVWMRI
Development Organizations: Dr. Sieglinde Star Snapp, Program Director, Sustainable Agrifood Systems program, CIMMYT, Mr. Kevin Fath, Agricultural Development Officer, USAID Mission, Bangladesh, Deepak Dhoj Khadka, Vice President, Asia, IDE, Mr. Arnoud Hamelers, Country Director, IFAD Bangladesh, Dr. Shawkat A Begum, Country Director, Practical Action Bangladesh





*The Feed the Future Cereal Systems Initiative for South Asia
Mechanization and Extension Activity Semi-Annual Report, 2021-2022*

Day 2 - Morning:

Registration: (08:30-09:30)

Session 3: (9:30-13:00) Manufacture of agricultural machines and spare parts

Session Chair: Mr. Kazi Sakawat Hossain, Additional Secretary, (BSCIC, SME & BITAC), Ministry of Industries

9:30 to 9:55: Trends in agricultural machinery and spare parts manufacture and sale in Bangladesh

Scene setting presentation: Prof. Dr. Md. Monjurul Alam, Professor, Department of Farm Power and Machinery, BAU

9:55 to 10:20: Current practices and perceived constraints to agricultural machinery manufacturers in the light engineering hubs of Bogura and Jashore.

Scene setting presentation: Prof. Dr. Jonathan Colton, Georgia Institute of Technology, USA

10:20 to 10:45: Constraints to the development of the light engineering sector in Bangladesh - practical experience from Jashore:

Scene setting presentation: Ms. Mehjabin Ahmed, Senior Manager, Private Sector Development, Prabhridhhi- Local Economic Development, Swiss Contact

Tea Break and Snacks

11:00 to 11:25: Innovative approaches toward sustainable provision of skills training for agriculture based light engineering enterprises

Scene setting presentation: Ms. Bharathi Parupalli, Lead Training Coordinator, CSISA-MEA, CIMMYT Bangladesh

11:25 to 11:40: New perspectives on innovation processes for Agriculture

Scene setting presentation: Mr. Arnaud Hameleers, Country Director, IFAD Bangladesh

11:40 to 11:55: An interactive session to elicit their views of workshop participants on the prospects for and the challenges with the development of the agricultural mechanisation value chain from manufacturing to machinery service provision.

Scene setting presentation: Dr. Brendan Brown, Socio-economist, CIMMYT, South Asia

11:55 to 13:00: Panel discussion on presentations in morning session

Moderator: Dr. Md. Ayub Hossain, Chief Scientific Officer, FMPE, BARI

Panellists:

Government Representatives: Dr. Md. Abdul Wohab, Ex-Director General, BARI, Dr. Engr. Syed Md. Ihsanul Karim, Director, Tools & Technology Institute (TTI), BITAC

Industry representatives: Mr. Alimul Ahsan Chowdhury, Managing Director, Alim Industries Limited.

Machinery hubs representatives: Mr. Ole Ullah, Managing Director, Janata Engineering, Chuadanga, Mr. Paritosh Malo, Proprietor, RK Metal, Faridpur, Mr. Md. Rezaul Karim (Reza), Reza Engineers, Bogura, Md. Samsul Alam Sapon, Shilpy Metal Foundry, BSCIC, Jashore.

Development organizations: Dr. Ms. Shawkat A. Begum, Country Director, Practical Action Bangladesh and Mr. Mashfiq Akbar, Private Sector Advisor, UKAid, FCDO, Bangladesh

Technical/Vocational Institutes: Mr. Philip Biswas, Founder Executive Director Rural Reconstruction Foundation (RRF)

Lunch and Prayer

Day 2 - Afternoon:

Session 4: (14:00- 16:30-): Access to Finance and business development

Session chair: Dr. F.H. Ansary, President, ACI Agribusiness Division and Managing Director, ACI Motors Ltd.

14:00 to 14:30: Current practices, challenges, prospects and new approaches for accessing finance for investment in machinery manufacturers and finance for machinery importers and buyers.

Scene setting presentation: CSISA-MEA – IDE (Ms. Elizabeth Lahiff, Team Leader, CSISA-MEA, IDE and Ms. Tanzila Tajireen, STS - Access to Finance) and Ms. Tamanna Sohanee, Business Consultant, LightCastle Partners

14:30 to 15:00: Light Engineering & agricultural mechanization businesses led by women and youth

Scene setting presentation: Ms. Bidowra Khan, Regional Gender and Inclusive Development Advisor, ACI/VOCA

Tea Break and Snacks

15:30 to 16:30 Panel discussion on financial services

Moderator: Mr. Md. Abdul Hakim, General Manager, Agricultural Credit Department, Bangladesh Bank

Panellists:

Private Banks: Mr. Syed Abdul Momen (Deputy Managing Director, BRAC), Mr. Majidul Haque (Prime Bank), Ms. Shahnaz Akter Shahin, First Vice President and Head of Agricultural Lending, Bank Asia Limited

Non-Bank Financing Institutes: Mr. Syed Javed Noor (Deputy Managing Director, IDLC)

Microcredit Organizations: Prof. Dr. Hosne Ara Begum, Executive Director, TMSS, Dr. Md. Mahub Alam, Senior Director, Gram Unnayan Karma (GUK)

Machinery importers/distributors: Mr. Md. Amir Hossain, FCMA, FCA, Head of Business, Abedin Equipment Ltd.

Development Organizations: Dr. Bidyut K. Mahalder, Senior Programme Advisor, Food and Agriculture Organization of the United Nations (FAO), Arafat Hossain, Team Leader, Bangladesh Microinsurance Market Development Project (BMMDP), Swiss contact Bangladesh

16:30-17:30: Wrap Up session

Chair and Plenary speaker (30 minutes): Prof. Dr. M.A. Sattar Mandal, Emeritus Professor in the Dept. of Ag. Economics & Former Vice-Chancellor of Bangladesh Agricultural University, Mymensingh (BAU), Former Member of Planning Commission (Gen. Econ.; Agriculture), Govt. of the People's Republic of Bangladesh.

Take home messages and Vote of Thanks – (30 Minutes)

Mr. Kazi Sakawat Hossain, Additional Secretary, (BSCIC, SME & BITAC), Ministry of Industries

Mr. Md. Benojir Alam, Director General, Department of Agricultural Extension (DAE)

Mr. Md. Abdul Hakim, General Manager, Agricultural Credit Department, Bangladesh Bank

Sheikh Md. Nazimuddin, Coordinator, Agril. Machinery Development Assistance Cell, Field Service Wing, Department of Agricultural Extension (DAE)

Dr. F.H. Ansary, President, ACI Agribusiness Division and Managing Director, ACI Motors Ltd.

Prof. Dr. Md. Monjurul Alam, Department of Farm Power and Machinery, BAU

Dr. Timothy J. Krupnik, Country Representative, CIMMYT Bangladesh



Annex 4: ABLE's investment/contribution determination guideline for Stage 2 ABLE SME support

▪ What is meant by ABLE SME investment/contribution?

In the Stage 1 collaboration between ABLE SMEs and the Activity, ABLE SMEs received support in the form of capacity building of their workforce and management, as well as linkages with financial institutions and product supply networks.

However, Stage 2 collaboration depends on (1) the capacity of each ABLE SME, and (2) a more proactive commitment. A joint investment plan is essential for customized support, where beside Activity support, investment from the SME (cash and in-kind) would be expected. This means that each ABLE SME must have the willingness to contribute cash and in-kind support towards implementing the activities specified in the joint venture agreement.

This includes new long-term capital investments (such as property, plant and equipment, and other fixed assets) and new operating capital investments (for example, inputs, promotional expenses and inventory), leveraged by CSISA–MEA.

▪ Types of ABLE SME investment/contribution

- **Cash investment/contribution:** direct cash contribution to the specific activities related to Activity.
- **In-kind investment/contribution:** contributions from ABLE SMEs through in-kind support that will be converted into monetary value.

The table below presents details of in-kind contributions expected from ABLE SMEs signing a JVA with CSISA–MEA:

▪ Types of in-kind contribution (investment) from ABLE SMEs

SL	Item name	Considerable areas of ABLE SME contribution to JVA activities	Investment/contribution descriptions
I	Human resources	<ul style="list-style-type: none"> - staff/workforce time involvement for JVA related activities - owner's time involvement for the JVA related activities - expert trainer's time for the project activities - hiring additional staff/workforce for JVA-related activities 	<ul style="list-style-type: none"> - involvement of staff, workforce, owner and expert trainer's time with shared activities or plan to hire new human resources or retain the staff/workforces with higher remuneration for implementing the joint activities will be considered as in-kind contributions. To determine this in-kind investment amount, salary/wages/honorarium of the engaged personnel will be calculated in the following way:



SL	Item name	Considerable areas of ABLE SME contribution to JVA activities	Investment/contribution descriptions
		<ul style="list-style-type: none"> - retain the staff/workforce with higher remuneration for JVA related activities 	<ul style="list-style-type: none"> ○ per day honorarium for staff who will be engaged in JVA-specific activities ○ owner's engagement time with JVA activities will be considered; in this case, owner's monthly honorarium will be calculated ○ trainer's daily honorarium or monthly salary will be considered for the time involved with JVA related activities
2	Equipment/tools or capital machinery	<ul style="list-style-type: none"> - uses of the capital machineries for JVA related spare parts manufacturing - Plan to buy any new equipment/tools or capital machineries 	<ul style="list-style-type: none"> - ABLE has the capital machinery which can be used for fabrication of the spare parts. Rent per day for the capital machineries and how many days/hours the machines are used for JVA related work will be considered. - The ABLE SME must buy new equipment/tools or capital machinery that is required to achieve the JVA related activities. Full price and installation cost of the new machineries will be considered as in-kind investment
3	Office vehicles, including motorbikes	<ul style="list-style-type: none"> - The official vehicle or bikes for delivery or promotional purposes used by the ABLE SME. If the official vehicle is used for JVA related work, this will be considered as a contribution 	<ul style="list-style-type: none"> - Per day rent will be calculated and time/period of engagement of the official vehicle or motorbikes for JVA specific works (such as raw material collection, spare parts delivery) will be considered as contribution
4	Training	<ul style="list-style-type: none"> - training fee, travel, incentive for staff/workforces capacity building or additional space might be needed beyond the existing facilities for technical training purposes. 	<ul style="list-style-type: none"> - Money spent by an ABLE SME on staff/workforce training will be considered as an investment or contribution. - additional space rent for JVA related training purposes will be considered as contribution on a per day basis
5	Additional space, storage/invent ory space	<ul style="list-style-type: none"> - production floor (new/extension/maintenance, change layout) - fabricated parts are stored in the existing 	<ul style="list-style-type: none"> - Full expenses of production floor development (new/extension/maintenance, change layout) as needed for JVA purposes will be considered as contribution



SL	Item name	Considerable areas of ABLE SME contribution to JVA activities	Investment/contribution descriptions
		workshop area. If any bulk production is required as a result of the JVA related work or orders from lead firms, additional storage facilities may be required	- Per day rent for the additional space will be calculated and total rent for the additional space during the JVA implementation period will be considered as in-kind investment or contribution.
6	Administration, overheads and other costs	<ul style="list-style-type: none"> - percentage of the ABLE SMEs' administration and overhead costs including utilities and rent - software/information system/Website (finance/inventory management) - improving of organizational management functions including governance, environment/legal and certification 	<ul style="list-style-type: none"> - in the case of administration costs, overheads must be proportionate to the human resources engaged in JVA activities. - software costs (finance/inventory management/information system/Website development) will be considered as contribution if it is required for JVA implementation - costs for improving the ABLE SME's organizational management functions (including governance, environment/legal and certification) will be considered as contribution if it is required for smooth implementation of JVA initiatives
7	Marketing, promotional activities and materials	- each ABLE SME conducts its own marketing activities and develops promotional materials. As implementation of the JVA by the ABLE SME may produce a larger volume of materials the ABLE SME will have to run its own marketing activities	- dealer commission/incentives, sales incentives, linkages events, advertisement, sales discount offer, promotional campaign cost, promotional materials development costs (including leaflets, signboards, branding materials development costs) specifically related to the JVA will be considered as contribution
8	Technology design and development	-the ABLE SME usually develops parts or prototypes as part of R&D with the help of government linkages or a relevant company.	- prototype design and development-related costs will be considered as contribution if needed for implementing the JVA



FEED THE FUTURE

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

SEMI-ANNUAL REPORT (OCTOBER 2021-MARCH 2022)

Cereal Systems Initiative for South Asia- Mechanization and Extension Activity (CSISA-MEA)



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