Tech-sheets

The dynamic **innovations** behind the success of **CSISA-MI**

This document details the innovative techniques deployed by CSISA-MI, the Pathway to Agricultural Development, Human Centered Design, Private Sector Engagement and Adaptive Management; the four key components instrumental to the success of CSISA-MI.

USAID FROM THE AMERICAN PEOPLE

CIMMYT International Maize and Wheat Improvement Center

iDE

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CSISA-MI has transformed agriculture in southern Bangladesh by unlocking the potential productivity of the region's farmers ...

Pathway to Agricultural Development - CSISA-MI Overview

The USAID Feed the Future (FtF) Zone in Bangladesh's southwest delta, faces greater food insecurity and lower crop productivity than anywhere else in the country. This is due to a combination of high energy costs, high labor scarcity, low crop intensity, limited access and use of innovative agricultural technologies. Family run smallholder farms in this zone rely on hired farm labor which perpetuate the low use of agricultural machinery. Historically, these types of machinery are used on large scale farms and when labor is cost prohibitive.

To address the challenges, the USAID-funded Cereal Systems Initiative for South Asia- Mechanization and Irrigation (CSISA-MI) project was initiated in 2013 to promote the adoption of efficient and low cost agricultural machinery by smallholder farmers in the southern region of Bangladesh. This ongoing project is a partnership between CIMMYT and iDE; two organizations with both complementary and distinct areas of expertise. iDE has extensive experience in engaging private sector partners and other value chain actors to establish a sustainable market system solution. CIMMYT's role focuses on mobilizing public sector partnerships, agronomic research and technical expertize on agricultural machinery development.

CSISA-MI introduced the axial flow pump (AFP), power tiller operated seeder (PTOS) and the reaper in the project. Through human-centred design processes, the team contextualized the machinery according to Bangladeshi standards. These resource-conserving machines significantly decreased the costs of farming production and increased productivity across the crop life-cycle which comprises of irrigation, tillage and harvest. As they have relatively higher flow rates than previously used centrifugal low-lift pumps, axial flow pumps (AFPs) are proving to be game-changers for irrigation. They are also able to move much more water with less fuel which is revolutionary for gher (fisheries) de-watering and watering purposes. Therefore in this region, surface water is abundant even during the dry season.

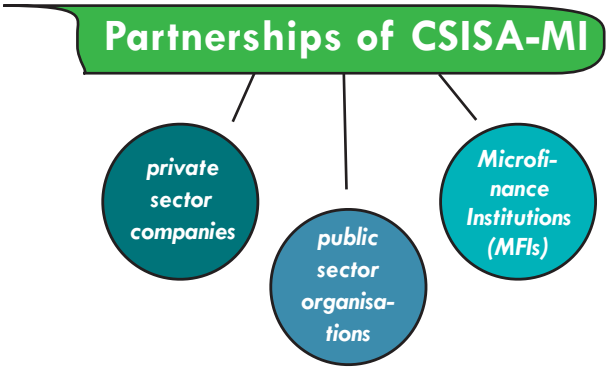
Power Tiller-Operated Seeder (PTOS) is an attachment for two-wheel tractors that allows for ploughing, seeding and leveling in a single pass. The two-wheel tractors are saturated in the market and there are over 500,000 units in Bangladesh. Mechanical Reapers can measurably improve harvest efficiency therefore allowing farmers to save time and labor, combat inclement weather and expedite harvest, which makes it possible to plant the next crop more quickly as well as increase the productivity of the land. Farmers traditionally harvest rice and wheat by either contracting laborers or by themselves.

These resource conserving machines significantly decreased the costs of farming production and increased productivity

At the heart of CSISA-MI's solution are service entrepreneurs know as Local Service Providers (LSPs) who risk their own finances to purchase innovative agricultural machines from local dealers. To gain returns on their investment, they are highly motivated to provide faster and cheaper services to smallholder farmers in the community. These LSPs are the risk takers and early adopters who provide the "seeing-is-believing" example for others to follow. However, introducing improved technology alone was not the only solution, as adoption will not work in a vacuum. LSPs need a combination of useful technology and services that complement it such as product knowledge, access to finance, after sales service and awareness raising for demand creation among farmers where they can find steady paying customers who use their service. This requires a connected network of market actors, ranging from large private sector companies, Government of Bangladesh ministries to the local mechanics who provide different type of services. Each actor has a value proposition that motivates them to provide these services.

The project worked with machinery that had performed well in the research of previous projects and was approved by the Government of Bangladesh (GoB) but had not yet gone to market in widespread fashion. Among other challenges, the project team needed to figure out potential barriers for the adoption of these technologies in the market and consequently use their findings to adapt and refine strategies.

CSISA-MI worked with three types of partnerships which were mutually beneficial as they allowed the partners to pool core competencies as well as share risks, responsibilities, resources and expenses.



Starting with two private companies and eventually expanding to several other companies helped to increase the market competition. The project also worked intensively with two major public sector partners namely Bangladesh Agricultural Research Institute (BARI) and Department of Agricultural Extension (DAE). BARI provided quality control testing for domestically produced AFPs and DAE, with its wide nationwide network, helped to increase the benefits of using the new technologies among the farmers in the project region. Moreover, another critical partnership was formulated with MFIs such as TMSS, GJUS, AID, Padakhep, JCF and SDC, all of which were located in the project sites. The MFIs worked with the LSPs to ensure that they may purchase the machineries on time and provide smooth services to the farmers.

The private companies were initially selling the machineries only to government institutions, which were irregular and less profitable. The project approached and negotiated with several private companies to sell their machines directly to LSPs . This allowed for a steadier, larger volume of sales and was more profitable for them. In order to alleviate initial skepticism on the part of private sector partners, the project agreed to buy down risk through cost sharing to help them leverage their brands and build their confidence in this new arrangement



The companies soon realized that by selling their machines to LSPs, they could enter into an expansive untapped market of small farmers across southwest Bangladesh. Additionally, the private companies realized that by providing embedded after-sales service and provision of spare parts, their brand value was improving. On the other hand, the project also helped LSPs with limited finances to invest in buying machines by linking them with MFIs for loans. In some cases, they have been able to recover the cost of the machines in just one season.

With this new partnership between private companies and LSPs, farmers in southwest Bangladesh could avail mechanized farming services and could achieve higher yields and increased income.

Through mechanized services, farmers can benefit through higher yield and crop intensification; private companies realize higher profits through increased and more diversified machines sales; mechanics have increased demand for after-sales services (repairing and maintenance); local businesses see increased sales and demand for fabrication of spare parts; and finally LSPs have an increasing client base of satisfied farmers who are demanding services from them.

The rural economy throughout Bangladesh is still heavily reliant on agriculture, hence there is significant potential to introduce, adapt and scale these technologies to other regions. The project experiences and results will encourage future development projects to adopt a similar market-system development approach to commercial scaling of innovations, and donors to consider funding more of these types of projects.

This methodology was used to deeply understand the needs of smallholder farmers and create a sustainable solution

Human-Centered Design

CSISA-MI's introduction of three new agricultural technologies - axial flow pump, reaper, and power tiller operated seeder (PTOS), came with a promise of benefiting smallholder farmers to achieve decreased production costs and increased cropping intensity. To begin the journey towards reaching this challenging goal, the project searched for the right blend of products, partnerships and business models that would create a synergetic effect and permeate the entire supply chain. They eventually found the right market-system mixture with the help of human-centeered design.

Human-centered Design (HCD) is a leading innovation methodology that maximizes the likelihood of adoption, long-term sustainability and scalability of a market-based solution.

HCD is a recognized best practice amongst the world's largest market-based consumer goods and services firms. It has gained recent credence in the development sector as a means to improve the ROI (return on investment) as well as the probability of scale and sustainability of market-based initiatives. It is used to design and deliver holistic solutions, usually a combination of product(s), service(s), marketing, financing and distribution.

HCD utilizes an ethnography-like approach to deeply understand latent user and stakeholder needs and combines this with design methods and expertise from product design, industrial design, business design, service design and marketing strategy. The

HCD helped develop commercial partnerships and service models that enable sustainable businesses.

result is a market-based solution that is desirable, accessible, usable, maintainable and affordable to consumersas well as technically feasible and economically viable. All three of the products selected by CSISA-MI had previously been proven as technically feasible, but not necessarily desirable or viable in the market.

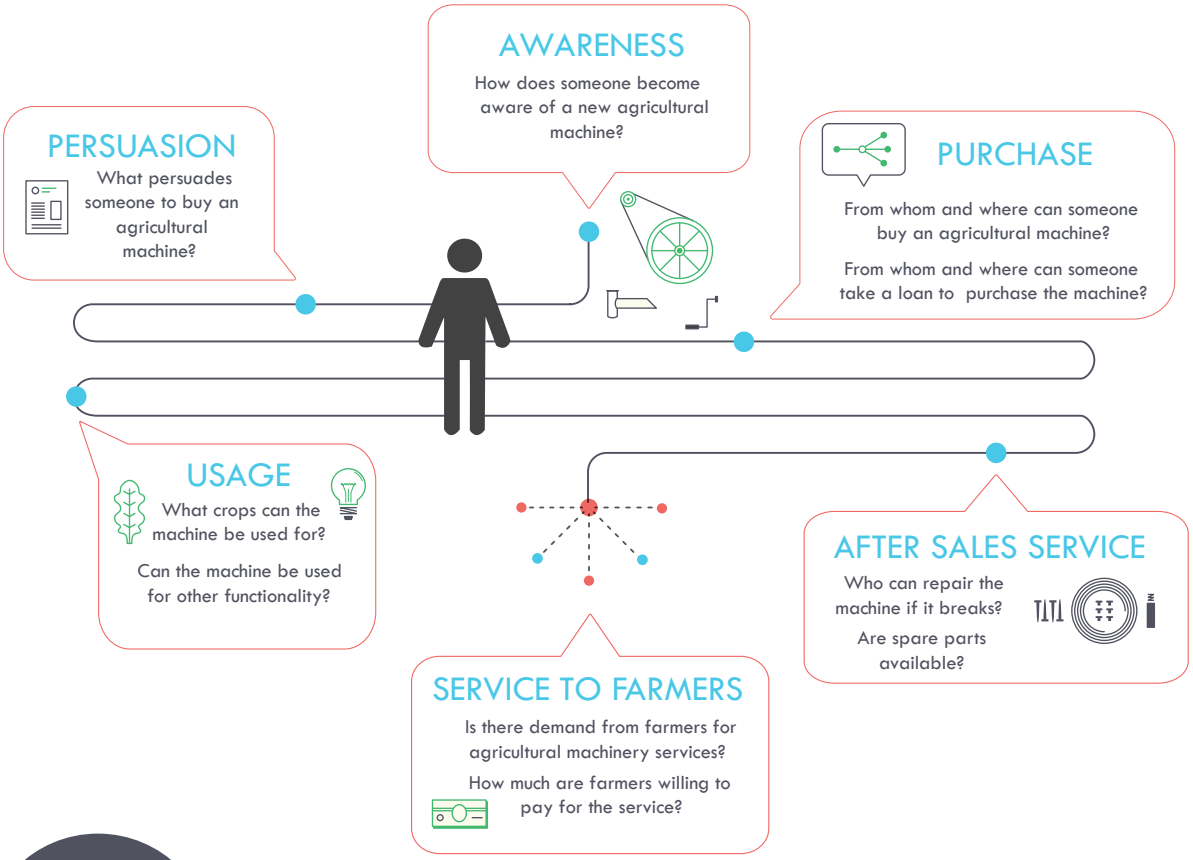
CSISA-MI used the principles of Human Centered Design to identify design elements of these products that met all three of these criteria. HCD helped develop commercial partnerships and service models that enable sustainable businesses.

CSISA-MI integrated HCD into all aspects of product, services, partnerships and business models. During the initial stages of research, the project realized that technology commercialization is part of a larger web of interconnections between users and suppliers/market actors.Project interventions in product refinement, partnership development, machine adoption and service delivery all benefitted through adapting their approach to meet the needs identified in the HCD research.

During the first “deep dives” (a key research tool in the HCD toolbox) the team listened to farmers and service providers of existing agricultural machineries to better understand their needs to make traditionally unpopular machines more desirable. The “deep dives” explored how entrepreneurs would use the technologies to provide agricultural services to farmers. The answers eventually led CSISA-MI to develop the local service provision model. The local service provider (LSP) is an entrepreneur who buys agricultural machinery and then provides paid services to farmers to earn a return on their investment. Keeping LSPs at the focal point, they focused on the perceptions, needs and desires of the LSPs to understand what they value as key features or benefits of agricultural machineries. The team used an empathy map to record sensory and behavioral feedback of the LSPs’ interactions with the technologies, which helped to understand challenges and opportunities in LSP business models. Additionally, the team used a journey map to record the experiences of the LSPs, starting from when they heard of the technology to how they provide services to farmers.

The team realized that in order to enhance the LSP’s business model to function more efficiently, project interventions should have a deep understanding of value proposition in the market. Uncovering the underlying value propositions enabled the team to connect solutions to problems by identifying gaps in services, utilizing opportunities and minimizing challenges. Maintaining the agricultural machinery market’s value proposition became the guiding principle of CSISA-MI’s strategy for sustained adoption.

LSP JOURNEY MAP



Case Studies

Power Tiller Operated Seeder (PTOS)

The impetus for the PTOS was to introduce a technology that could till and seed simultaneously. In Bangladesh, the market for two wheel tractors, locally known as power tillers (PT), was already saturated with more than 500,000 in operation throughout the country. An attachment seemed the best approach to introduce a multi-functional technology.

PTs are the current practice for mechanized tilling, but with the seeder as an attachment, an acre of land could be tilled and seeded in one pass requiring only half the amount of time and half the amount of fuel. Previous research had verified the agronomic utility of the PTOS, but HCD helped us better understand the user experience:

• Although the intent was for the machine to be used for line sowing and strip tillage together, LSPs would buy the PTOS, remove the seed-box and only use it for tilling.

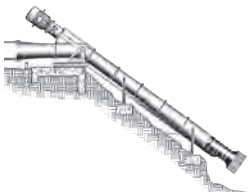
• LSPs did not like the way dust flew up into their faces as they used the machine and they longed for a seat to reduce physical stress.

• When it came to purchasing the machines, dealers often unpacked the machines to display them in their shops and save space. However,

LSPs preferred buying machines packed in wooden crates as it was a sign of import and quality.

The CSISA-MI team decided to redirect a combination of people, time and money to focus on improving the design and marketing for the machines. By addressing the desirability, viability and feasibility challenges, CSISA-MI is now reaping the rewards of adoption.

PTOS has now passed the tipping point of 16% of the potential market in the FTF zone. Additionally, there are 4 private sector firms supplying PTOS with after-sales services and dealership networks beyond the FTF zone.



Axial Flow Pump (AFP)

The push for adoption of AFPs in CSISA-MI aimed to replace traditional Low Lift Centrifugal Pumps (LLPs), which were a popular technology for irrigation in Bangladesh. The LLP is an astonishingly sturdy pump, lasting for more than 30 years. However, the AFPs had some key advantages:

• LSPs did not like the way dust flew up into their faces as they used the machine and they longed for a seat to reduce physical stress.

• AFPs require less fuel to pump the same amount of water in less time, saving farmers' time and money.

• AFPs do not need to be primed by pouring water down them during the cold winter months, which often involved farmers getting into the water and required at least two people to start the machine.

The AFP, based on a profitable business model, appeared to be agronomically and technically superior to the LLP, however, adoption remained lower than expected.

The AFP, based on a profitable business model, appeared to be superior then the LLP in agronomical and technical terms. However, first year adoption was lower than expected.

During "Deep Dives", the team began to understand that although LSPs were excited about the greater water pumping and the fuel savings, they were deeply nervous about a pump that they perceived as flimsy and unreliable in comparison to the LLPs. In a context where the LSPs' communal reputation as a reliable service provider was on the line, the pump proved too large a risk for many.

To address the problem, the CSISA-MI team worked with its private sector partners to reverse engineer the AFPs using nationally available materials to design the pump to suit the Bangladeshi context. This re-modelling made the AFPs appear more durable due the use of thicker gauge steel, addressing some of the visceral concerns of potential LSPs. The reverse engineered designs were open sourced, allowing Bangladeshi manufacturers to produce domestically.

However, this created new challenges in production quality of the AFPs, leading to frequent breakages. The team is now addressing the supply chain quality issues with a deep dive into the manufacturing process. By uncovering the specific challenges and by getting feedback from our private sector partners, the project plans to co-create a standard operating procedure (SOP) and train supply chain technicians and managers on the SOP to maintain a consistent quality standard in dealership networks beyond the FTF zone.

PRIVATE SECTOR ENGAGEMENT

The CSISA-MI project undertook a deep and broad market analysis process to identify why the agricultural machinery market in Bangladesh was not efficient. It listened to every stakeholder; the suppliers, producers, dealers, mechanics and others, who might have an influence on LSPs, and created a holistic understanding of the links in the value chain and the roles of each market player. The project eas built on the insight to develop business solutions that made new connections and strengthened existing ones to achieve a more robust market ecosystem.

CSISA-MI's role as a market facilitator, technical support provider and co-investor supported private partners' incentives in finding competitive advantage and the next market opportunity. Similar to how the project targeted early adopters of agricultural machinery, it also targeted vertically integrated firms for partnerships. The aim was to have private sector partners fold agricultural machinery into their strategic priorities such as incorporating a dedicated unit focusing on the supply and sales of agricultural machinery products.

In selecting its partners, CSISA MI took following 4 steps:

- Conducted research on potential partner companies and further screened the respondents using interviews.
- Reviewed and assessed the companies in order to develop a "short list".
- Additional dialogues to gauge their interest in particular technologies and strategies.
- Preparation of necessary legal documents to formalize the collaboration.

The table below illustrates the private companies that have been associated with CSISA-MI over the course of the project and when they came on board.

Technology	RFL	Metal	Janata	ACI	Alim
PTOS	2014	2016	2015	2016	2015
Reaper (Self propelled & Attachment)	n/a	2015	2015	2013	2015
Axial Flow Pump	2013	2015	n/a	n/a	2015

The project used a set criterion for the preliminary selection of the private firms. One criterion was that the private firm had to have a pre-existing market presence in the ag-machinery sector. If so, the project evaluated the relative market demand for their products or services in the target areas of CSISA-MI. Partners were also required to have demonstrated ability to compete in the target geographical areas in retailing their products or services and have a relative focus on the agricultural mechanization sector as the core business of the firm. Capacity for innovation was also important.

The project analyzed their relative willingness to make investments, to improve or expand relations with agricultural mechanization supply chain actors over an extended period of time, and their reputation in leadership and market innovation. Lastly, the project also focused on the ability of the firms to deliver commercialization such as established commercial linkages with a large number of suppliers/dealers in the target areas, potential to influence other supply chain actors and the potential to make investments or allocate resources to activities that resulted in improved and/or expanded relationships in the agricultural supply chain.

In year one, the project worked with two very large private sector partners: ACI (to introduce reapers and bed planters) and RFL (to introduce PTOS and AFPs). Since the market was not yet tested and established for the new products and the companies were not fully ready to completely assume the financial and business risks involved, the project entered into a cost-sharing agreement. CSISA-MI also provided these companies with incentives such as capacity building of its sales agents and in-kind technical assistance. These two companies had large logistical networks and were willing and able to take measured risks by integrating a new strategy into their existing business model plan. RFL and ACI's success paved the way for other companies to enter into similar partnership agreements, such as, The Metal (Pvt.) Ltd. (for Reaper), Janata Engineering (Reaper Attachment) and Alim Industries (for Reaper and PTOS) who subsequently formed partnerships with the project and entered into the market.

The cost share with these companies was gradually reduced during the project's third year as companies were seeing increased sales, profit, confidence and ownership. In the third year, companies were increasingly willingly to implement activities at their own cost and by the end of that year, private sector players such as RealPower, Janata (PTOS), and Chittagong Builders (Reaper) also stepped into the market. More partners coming forward to import or manufacture agricultural machines, helped to deepen and broaden the market and improve competitiveness. This also helped to bring down the retail cost of the machines and improve access for consumers such as small farmers. The Metal (Pvt.) Ltd. expanded its product line and introduced two additional machines (Reaper and AFP) and RFL, Metal (Pvt.) Ltd and RK Metal began to manufacture AFPs.

Companies such as RealPower, Janata, and Chittagong Builders are examples of private sector companies "crowding-in" to the agricultural machinery market, reinforcing the project's theory of change. As a case in point, Janata Engineering, now known as Janata Industries, was an agricultural machinery workshop based in Chuadanga district that the project supported in its early years. Janata Industries grew their business exponentially, hiring additional staff to focus on business development, marketing, and after-sales service. Based on their success with the reaper attachment, the proprietor of the business along with a technology advisor from the project visited China to inspect and assess local manufacturers in that country. After the visit, they later placed orders for 192 customized reaper attachments.

In addition to Janata, RK Metal, a local

workshop operating out of Faridpur, had previously fabricated prototypes of the axial flow pump and is in full production. The project, facilitated by assistance from BARI conducted prototype field-testing for the domestically produced pumps. RealPower purchased a reaper attachment from Janata Engineering in order to conduct their own assessment of the product. Based on farmers' responses to demonstrations, they later imported 20 reaper attachment units and one reaper binder to further test the market.

For CSISA-MI, although all the partner companies had prior experience in dealing with agricultural machineries, they had very little experience in handling the particular type of advanced machineries the project was introducing.

Private sector companies often prioritize efficiency and conventional practices that provide the fastest route to maximum profit. Thus, partnerships with them can have many challenges. From agreeing on a common goal, to building trust and resolving possible conflicts - all these take time and require strategic communication. For CSISA-MI, although all the partner companies had prior experience in dealing with agricultural machineries, they had very little experience in handling the particular type of advanced machineries the project was introducing. The fear of taking a risk with these new machines, which involved testing a completely new market segment, was counteracted by the potential benefit of partnering with a development project and was an important factor in the decision-making process. Another challenge for the private companies was that their field staff were already promoting and selling several other existing products. With limited knowledge of the new products and no guaranteed sales, many sales representatives were reluctant to talk to LSPs.

CSISA-MI helped mitigate some of these risks through activities that were a part of the cost sharing. Activities included helping companies develop new marketing strategies and spare parts. The idea behind focusing on sales agents was to build ideas by building the capacity of company sales agents to pitch the new products and working with local mechanics to provide after sales service. Their enthusiasm grew at the prospect of exploring sustainable business opportunities that will lead to increased sales and a loyal customer base. The project has also learned that in an ever changing market system, there is no single pathway to getting it right. Rather, one has to try different routes, making mistakes along the way and changing course accordingly with the market.

Adaptive management offers flexidility in implementation of strategies associated with cropping, technology and work plans and considerably helps improve the commercial sustainability of a business.

Adaptive Management

What is adaptive management?

Adaptive Management is defined as a structured, iterative process of robust decision making in the face of uncertainty. It is designed to reduce uncertainty over time via system monitoring. Adaptive management is a tool which can be used as a means to learn about a market system as well as influence change within it. Adaptive management is not about randomly trying things to see what works; rather, it is about intentionally and strategically honing in on strategies that will yield specific, positive development outcomes. There is no well-defined process or guidebook for adaptive management implementation; applying adaptive management is specific to the context of the project.

The objective of CSISA-MI is to introduce and promote adoption of new agricultural machinery to smallholder farmers to increase their productivity and incomes. This ongoing project is a partnership between CIMMYT and iDE. CIMMYT's role as the lead partner focuses on mobilizing public sector partnerships, agronomy research and technical expertise on agricultural machinery development. iDE brings in extensive experience in engaging private sector partners and other value chain actors to establish a sustainable market system solution. CSISA-MI operates which are characterzed by market forces, behaviors and social and political norms that are dynamic and often invisible.
To navigate the changing dynamics of the market system, CSISA-MI chose to use an adaptive management approach as part of its implementation strategy.

Application of adaptive management in CSISA-MI

Applying an adaptive management approach allows CSISA-MI to alter, or pivot, its strategy related to crops, technology or geographical locations targeted for commercialization. For example, CSISA-MI has been able to successfully adopt this approach at all levels of implementation, including overall strategy, work plans and activities. Because of this approach, CSISA-MI has improved impacts in commercial sustainability on the part of private companies who produce the machines, local service providers who adopt the machines and farmers who use the services. CSISA-MI has identified four key principles through implementation that are required for building a supportive environment for adaptive management. Adaptive management helps CSISA-MI to find the right balance between gaining knowledge to improve implementation in the future and achieving the best results based on the current knowledge at all levels of implementation. This report ends with two examples of adaptive management in practice.

Four key principles

For building a supportive environment for implementation of an adaptive management approach :

Organizational Culture

One of the key elements in successfully implementing adaptive management is building an organizational culture that supports staff to learn through experimenting and failing with different ideas and individually analyzing results as a means to identify new directions in which to go. In the Bangladeshi context, CSISA-MI observed that staff found this process difficult to adopt as they were accustomed to a top-down style of implementation. To address this challenge, the CSISA-MI leadership team championed a cultural shift toward the team working together to create innovative solutions rather than implementing handed down directives. This took the shape of routine meetings at all levels of implementation that provided the space for staff to discuss findings from activities and created a culture where management did not always know the right answer; peer review, respectful dissent and creative tension were encouraged.

CSISA-MI has learned that introducing adaptive management takes time to diffuse and become adopted by all levels of staff, as it represents a significant behavior change to traditional implementation style and inherently confronts embedded social hierarchies.

People and Skills

Adopting adaptive management requires a respected, empowered and accountable team that has the necessary skills to gather and use data to inform their work. For CSISA-MI finding the right structure and composition of the team did not come instantly. For instance, iDE originally designated their private sector engagement team as part-time, and their responsibilities were split with other projects, but this allocation proved inadequate to the task. The client relationship management, communication at the Dhaka and field levels, troubleshooting of agreements, and solving supply chain challenges required full-time intervention managers.

Therefore, iDE redesigned the composition of the team to have three dedicated intervention managers replace the two-person, part-time private sector engagement team. CSISA-MI has learnt through trial and error that minimum staffing impacts on implementation as there are not enough resources to effectively establish collaboration and feedback loops within teams and external partners.

Monitoring and Evaluation Tools

Monitoring and evaluation tools lie at the center of adaptive management; to be able to test ideas, teams need a monitoring and evaluation system that can provide information feedback loops. The CSISA-MI monitoring and evaluation system was designed to track FTF indicators such as; farmer adoption and hectares under cultivation from improved technology, but proved inadequate at tracking technology and business model interventions. Therefore, the CSISA-MI team developed an additional M&E system in the second year of the project that focused on collecting sales and adoption data to inform team decisions regarding strategy and activities. In combination with developing this new system, the project also launched a "Digital CSISA-MI" campaign to encourage teams to use ICT to access and share information. ICT platforms developments included dashboards tracking progress against machine sales and data visualization through mapping of market actors and sales. CSISA-MI has learnt that building an environment that encourages project field staff to regularly engage with the data and perform some of their own analysis and it requires intensive support and follow-up.

Navigating Reporting Regulations

Implementing an adaptive management approach requires buy-in from donor organizations to allow project teams to change their work plans rapidly to adapt to the needs and dynamic shift within the market system. In the first year of CSISA-MI, it became apparent that hitting the targets originally envisioned would be impossible both overall and in encouraging maize and wheat production in fallow land in particular, and required CSISA-MI to change its targeting approach in collaboration with the USAID Bangladesh Mission. For CSISA-MI, having a donor that was not just willing to pursue what appeared to be a high-risk experimental approach, but also champion the approach and change the targeting strategy provided to be the supportive environment needed to fully pursue an adaptive management approach. This was possible in part as CSISA-MI was a grant, not a contract or a cooperative agreement with USAID. CSISA-MI has learned that regularly communicating with donors has improved their understanding and buy-in of CSISA-MI's approach and activities, and in turn, builds the donor's comfortability with CSISA-MI pivoting and changing activities to follow market signals.

Adaptive Management in Practice

Machinery commercialization

CSISA-MI has adapted its strategy round selecting machinery for commercialization over the course of the project. Initially, machinery was chosen based on its relevance to cereal production and less emphasis was placed on farmer needs and market demand. Over the first year of the project, it became clear that the initially-selected machinery models, especially reapers and axial flow pumps, did not interest farmers as they were difficult to use and unreliable. Based on these early lessons, CSISA-MI applied adaptive management.

Firstly, the project started field testing machinery with farmers and Local Service Providers (LSPs) in order to understand the consumer experience and support private partners adapting machinery to meet the needs of the market. CSISA-MI also learned that it needed to concentrate not only on commercializing pro-farmer machines, but also ensuring after-sales servicing and availability of spare parts for end users. CSISA-MI determined that in addition to encouraging PSPs to offer more machine-focused training and increasing availability of company mechanics, it also needed to train independent local mechanics to bolster accessibility of after sales service options to farmers.

Partnership

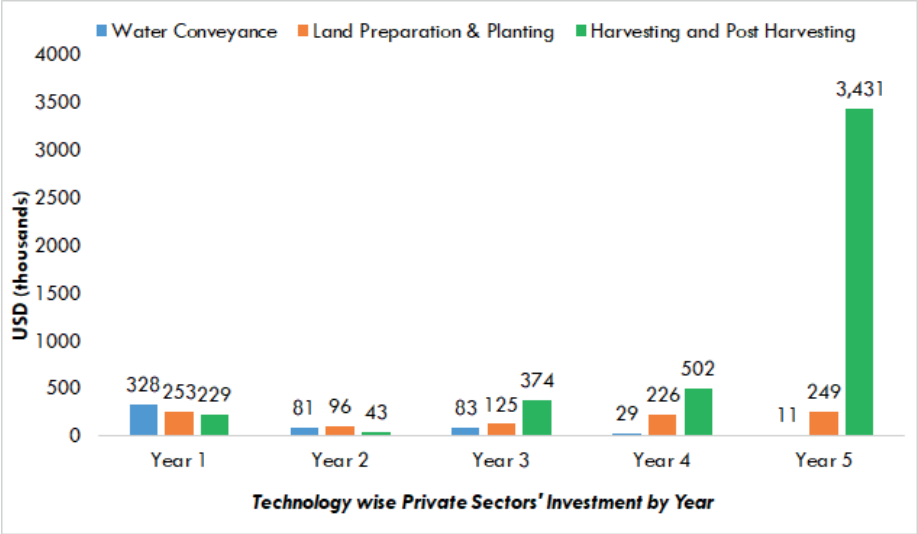
To build the necessary supply chains to support machinery commercialization, CSISA-MI needed to form partnerships with private sector partners to build demand at three different levels of the value chain: companies to dealers, dealers to LSPs, LSPs to farmers. Formal agreements played an important role in partnerships with the private sector. In Year 1, most CSISA-MI partnerships were established through letters of agreement (LOAs) which did not mention responsibilities, timelines or budgets. CSISA-MI found that dictating terms to the PSPs to meet project goals did not work.

The crowding-in has enhanced competition in the market, and increased sales volumes across the board as companies begin to perceive the immense potential of the agricultural machinery market.

Subsequently, the project switched to a joint venture agreement (JVA), which was in line with the company's goals, perception of value addition and was more adaptive in nature.

The JVAs captured the spirit of co-investment, capacity building and risk mitigation; they were less prescriptive, and more adaptive. One of the key successes of CSISA-MI has been demonstrated by the "crowding-in" of private-sector companies. CSISA-MI began with two private sector partners, RFL and ACI but other smaller companies such as the Metal (Pvt.) Limited, Alim Industries and Janata Engineering voluntarily approached the project to form partnerships after seeing the benefits these could bring. The crowding-in has increased competition in the market and increased sales volume across the board as companies begin to perceive the immense potential of the agricultural machinery market.

CSISA-MI **ACHIEVED** so far...



LSP **Developed**

2,867 are serving through 3,127 machines (AFP 1,006, PTOS 3,127, and Reaper 708)

Land **Covered**

About 100,949 Hectares (AFP 31,102 ha, PTOS 57,842 ha, Reaper 12005 ha)

Farmers **Reached**

More than 213,673 (AFP 38402, PTOS 147,330 Reaper 27,941)

Training **Provided**

About 40,061 Farmers, LSPs, Mechanics, Dealers, Civil Society and GoB officials.

CSISA-MI is a five-year project (July 2013 to September 2018), led by the International Maize and Wheat Improvement Center (CIMMYT), in partnership with iDE and funded by the USAID Mission in Bangladesh under the Feed the Future (FtF) Initiative. It has transformed agriculture in southern Bangladesh by unlocking the potential productivity of the region's farmers through surface water irrigation, efficient agricultural machinery and local service provision.

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