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CSISA-BD NEWSLETTER

USAID launches a New Initiative in South West Bangladesh to Popularize Mechanized Agriculture

The southwest of Bangladesh is the world's largest delta with a plentiful supply of fresh surface water that could be used to irrigate dry season crops such as maize and wheat. Over 600,000 hectares of land are left fallow during the dry season through lack of appropriate varieties, crop tillage equipment and irrigation equipment. To address this issue a new project was launched on July 01, 2013 called the "Cereal Systems Initiative for South Asia Mechanization and Irrigation (CSISA-M.I.)". This $13 million, 5 years project will be implemented by a partnership between CIMMYT and International Development Enterprises (iDE).

CSISA-M.I. is supported by US President Obama's Feed the Future Initiative, administered by the United States Agency for International Development (USAID) Mission in Bangladesh. CSISA-MI is a sister initiative and falls under the Cereal Systems Initiative for South Asia (CSISA) in Bangladesh project implemented by IRRI, CIMMYT, and WorldFish.

The CSISA-M.I. initiative will unlock the agricultural productivity of southern Bangladesh by increasing the availability and adoption of resource conserving irrigation equipment, Conservation Agriculture (CA) based crop management practices and the use of scale-appropriate farm machineries.

Local irrigation service providers in Putakhali, southern Bangladesh, demonstrate how a two-wheeled tractor can be used to power an axial flow pump to provide fuel-efficient surface water irrigation.

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These technologies respond to increasing rural labor scarcity and declining water resources and soil fertility.


Seed and fertilizer drill
Photo: Santiago Santos Valle CIMMYT


Bed Planter
Photo: CIMMYT

Crop production in southern Bangladesh is constrained by farmers' inability to invest in resource-conserving and productivity enhancing machinery, the high cost of pumping water , and lack of awareness about the potential for dry season crops like wheat, maize, sunflower, and grain legumes. CSISA-MI responds by developing smart business models to link farmers and agricultural service providers, and service providers to machinery and irrigation equipment dealers, to boost the use of irrigation and machinery for CA. The initiative will also bridge the gap between the public and private sectors by facilitating partner-ships with Government of Bangladesh institutions and private sector partners engaged in irrigation, agricultural mechanization and extension.

CSISA-MI will create broad access to low-cost surface water irrigation in the dry season. The MI initiative will also increase the commercial availability of smart agricultural machineries and associated services for farmers – to enable the optimal use of water, labor, time, seed and fertilizer for their fields. Research will be conducted on methods for the improvement of irrigation water use, agricultural water management and the fuel-saving axial flow pump (AFPs).

The value chains for the supply of two wheeled tractor compatible seed -fertilizer drills, strip tillage equipments and bed planters will be developed. Further, multi-crop reapers, and rice transplanters will also be tested. All this equipment helps farmers reduce turn-around time between crops.

CSISA-MI harnesses the power of the market to align incentives towards large-scale smart-technology adoption – and the initiative has already made significant progress. Memorandums of Understanding (MoUs) with leading industry leading firms, including RFL-Pran Group and ACI Agribusiness, have been signed to accelerate commercial the availability of AFPs, bed planters, and seed-fertilizer drills. The initiative targets that, by the end of the project, 90,000 hectare of land will be irrigated with surface water supplied by LSPs. Another 11,000 LSPs will be developed to provide scale-appropriate agricultural machinery services, including CA, to benefit 490,000 households.

Short season rice varieties allow oil seed mustard production in Aman Rice-Boro Rice cropping systems in Faridpur

Rice is the dominant food crop of Bangladesh. In Faridpur region, growing Aman Rice followed by Boro Rice is a popular cropping pattern. The time between Aman rice harvest in December and Boro Rice transplanting in February is not sufficient to grow a crop and so the land is not used for two months. Replacing traditional Aman rice varieties with varieties which mature 30 days earlier without significant yield loss would allow farmers to grow a short season crops such as oil seed mustard between the Aman and Boro rice crops.


Photo: Bushra Rahman/ CSISA-BD

Cereal Systems Initiative for South Asia in Bangladesh (CSISA-BD) has been working in Faridpur region from its inception to introduce oil seed mustard. Farmers were initially reluctant to adopt this crop as they feared cultivating this third crop would delay the transplanting of the Boro rice.

Therefore, to popularize this third crop, CSISA-BD conducted field demonstrations in 34 farmers' field at

Faridpur Sadar and Nagarkanda *Upazilas* showcasing Aman-Mustard-Boro cropping patterns compared with an Aman-Boro cropping pattern. In the demonstration plots, short duration mustard verities Tori-7, BARI Sarisha 14 and BARI Sarisha 15 were grown after new short duration Aman rice varieties such as BBRI Dhan49 and Bina Dhan7. To save time the mustard was sown onto the wet paddy soils just before the harvest of the aman rice crop. By the time the aman crop was harvested, the mustard seed had germinated and the crop was established. Using conventional tillage systems would have required delaying sowing the mustard seed after the harvest of the rice crop and after the rice fields had dried out sufficiently to allow power tillers to till the land. The two or three passes of the power tiller required to achieve a fine enough tilth for mustard seed sowing would have further delayed planting. By using this relay system at least 20 days are saved which is vital if the mustard crop is to be harvested before the optimal time for Boro rice transplanting. As it is not necessary to hire power tillers to prepare the land for mustard seed sowing and as the system takes advantage of residual moisture from the rice crop to induce mustard seed germination this eliminates most land preparation and irrigation costs.

The yield and production costs from the demonstration plots were carefully collected by the Faridpur team and showed that farmers earned an extra $316 / ha from the plots growing the best yielding mustard, BARI Sarisha 14. This variety produced 0.94 t/ha grain in 80 days.

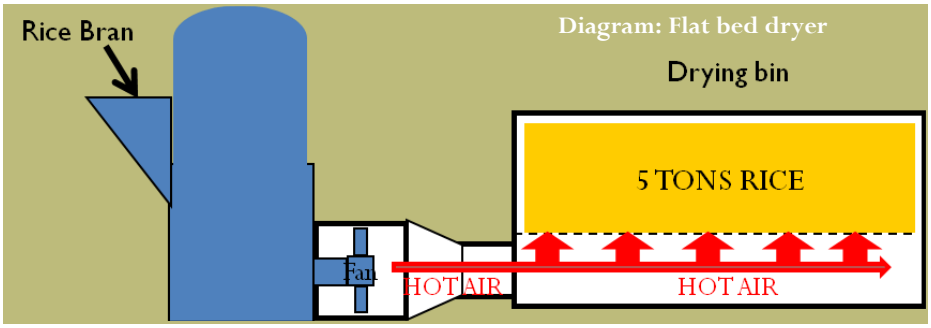
The demonstrations showed farmers that by planting early maturing, high yielding aman rice varieties it was possible to grow a dry season cash earner such as oil seed mustard without delaying boro rice transplanting and as a result many farmers are now adopting this cropping system.

Flatbed Dryers facilitate rice seed drying in the monsoon rains for Jessore based seed company

Shahanwas Ali, owner of Ali Seeds of Jessore, has been involved in the paddy seed business for more than a decade. Mr. Ali buys Boro and Aus season rice seed from contracted farmers in May and June when the monsoon rains are starting. The seed he buys is often too wet to be successfully stored until the next planting season and so he tries to dry the seed in the sun on concrete drying floors. Two to three days good weather brings the moisture content down to the desired 11% but if it rains, as often occurs with the start of the monsoon, drying is slowed and the seed germination declines in storage. In 2012, he lost around 400 tons of paddy seed.

At the beginning of 2012, Shahanwas approached the Cereal Systems Initiative for South Asia in Bangladesh (CSISA-BD) project seeking technical assistance. It was suggested that he install a rice husk fueled flat bed drier. This uses a fan to push heat generated in a furnace fueled by rice husk through a "flat bed" of rice seed. The diagram below shows the furnace, the fan and the large bin holding the rice seed. Hot air from the furnace is pushed through slats in the metal sheet floor of the bin by the fan. The fan is driven by a diesel or electricity powered motor. The photograph shows the furnace and the fan housing. A drier like this can be designed to dry grain or seed in batches of one to 10 tons each. The drier Mr. Ali built has a capacity to dry five tons batches.

Flatbed Dryer installed for Ali Seed Farm in Jessore/ Photo: IRRI



On average the drier reduces grain moisture content by one percentage per hour . Thus taking grain from 16% moisture to 11% takes 5 hours. In one day Mr. Ali can dry down 10 tones of seed. Although the cost of drying in the sun using the cement floor is the same as using the flat bed drier the speed at which the seed can be dried is only 1 day as opposed to three days using sun drying. Most importantly, though, Mr. Ali is no longer dependent on the provision of good, rain free weather to dry his seed. He has full control over the process and can dry his seed whenever he wishes.

CSISA-BD consider these flat bed driers will become popular with small seed companies and millers wanting to dry down relatively small batches of seed and grain at the start of the monsoon. This is a very common requirement for millers buying boro rice after harvest in May and June. Driers could also become business for village entrepreneurs selling grain drying services to farmers wanting to store grain until prices rise later in the year.

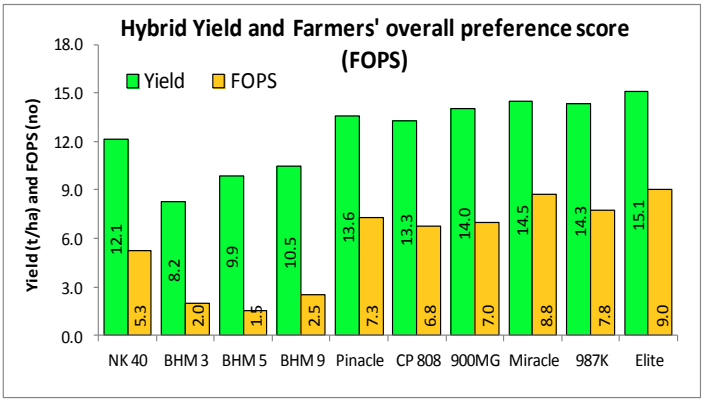
Flatbed Dryer at Ali Seed Farm in Jessore

Myminsingh Maize Farmers use their Researcher skills to select New Hybrid Maize Varieties

The idea that farmers are passive recipients of new technology has been shown over and over again all over the world to be erroneous. Farmers are, and have always been investigating ways of improving their production. This particularly applies to testing new varieties. Farmers are always interested in trying out a new variety. They may not plant their whole farm to a new variety but they will try it out on a small patch of their land. Thus when researchers come and ask them if they are interested in planting a trial plot that will compare their variety with one or more new varieties most farmers are eager to take advantage of this opportunity to become a research scientist.

In Bangladesh, Scientists are developing a wide range of crop varieties and management technologies in the research centers. But when farmers are left out of the process, they often resist accepting innovations as they do not suit their agronomic and socioeconomic circumstances. Research partnerships with farmers bridge the knowledge gaps and improve rates of innovation and adoption.

In Mymensingh CSISA-BD maize scientists have been helping farmers test new maize hybrids and through this have brought farmers directly into the crop breeding process by field testing and evaluating the new varieties in their fields.



Average Yield, and Farmers' overall preference scores (FOPS) to varieties of PVS-maize trial

10 hybrid maize varieties tested by 10 lead farmers in each of 20 locations evaluated new hybrid maize varieties, including the widely used variety NK-40. They used a scoring system to rank the varieties in which they selected the varietal characteristics they preferred and gave a score for each variety for each characteristic. The Figure below shows the average grain yield and the score given for each variety.

With the exception of NK-40 the highest yielding varieties were also given the highest scores.

NK-40 is very susceptible to lodging and so it scored badly for this reason

whereas varieties such as Pinnacle which has good lodging resistance were given high scores.

Knowing that farmers place characteristics like lodging above grain yield not only helps the farmer when selecting a new variety it also helps the plant breeder as it indicates the types of characteristics that are needed by farmers and this will result in varieties being produced which are acceptable to farmers.


Photo: CIMMYT

Highlights


Photo: WorldFish

During National Fish Week-2013, 19 CSISA-BD farmers were awarded by the Department of Fisheries, Government of Bangladesh for their leadership in motivating others for disseminating Improved Aquaculture Technologies. Ms. Jhorna Rani Makhal is one of these award winners.

Ms. Jhorna Rani Makhal of Bajuadanga Village in Satkhira *Sadar* received the best farmer in the district award in the National Fish Week 2013. Ms. Jhorna is one of the CSISA-BD farmers. Ms. Jorna adopted modern technology for household pond aquaculture and homestead gardening. She also played a vital role in leading 20 poor families adopt homestead gardening and household pond aquaculture.

Parimal Chandra Sarker achieved 2nd Best Presenter Award at the 12th Bangladesh Society of Agronomy (BSA) Conference held on September 20, 2013 at BARC, Dhaka. Parimal presented paper on Effect of zinc dose on grain zinc content, yield and profitability of rice.

CGIAR centers based in Bangladesh representing international agricultural research institutes and the Bangladesh Agriculture Research Council representing the national agriculture research system (NARS) formed the CGIAR Advisory Committee on the 22nd August with support from CSISA-BD. The CAC will be a forum for the planning of collaborative programmes and coordination of activities between the CGIAR centers and NARS.

Five Bangladeshi young rice scientists win travel awards in a global competition. The young scientists traveled to IRRI Head Quarters in Philippines and presented research findings at an international workshop for Young Rice Researchers on October 16 and 17, 2013. From CSISA-BD the award winners are: Debabrata Mahalder, Deb Kumar Nath, Md. Shuhan Hossain , Ireen Sultana and Shama Nasrin.


CSISA-BD winners with CCISA-BD Chief of Party

CSISA-BD organized a two days long training course on Capacity Building on Commercial Aquaculture Management for Marketing Officer (MO) of Spectra Hexa Feed Ltd. (SHFL) on June 27-28, 2013 at Spectra Hexa Feed Ltd. Gulshan, Dhaka office conference room. The objective of training was to improve the knowledge and skills of SHFL marketing officers' on Commercial Aquaculture Management.

CEREAL SYSTEMS INITIATIVE FOR SOUTH ASIA IN BANGLADESH

The Cereal Systems Initiative for South Asia in Bangladesh project (CSISA-BD) is implemented through a partnership between 3 CGIAR centers, International Rice Research Institute (IRRI), International Maize and Wheat Improvement Center (CIMMYT) and WorldFish (WF). CSISA-BD is funded by USAID's Feed the Future (FtF) initiative, and aims to test and disseminate new cereal system-based technologies that will raise family incomes by at least $350 for 60,000 farming families. It is anticipated that a further 300,000 farmers will adopt new technology through participation in field days and farmer to farmer information and technology transfer.

USAID are investing $24.4 million in the CSISA-BD. The project is now completing its third year of implementation.

Achievements to date

Developed production packages that in crease income for the average project farmer cultivating 0.12 ha.

- **Aman rice / mustard / Boro rice - $80**
- **Aman rice / sunflower -$100**
- **Rice / wheat / mungbean - $205**
- **Rice / Maize - $516**
- **Fish - $1,619**
- **Shrimp – $1,472**

All these production packages are now being scaled out through partnerships with the private sector currently under development.

Identified varieties (rice and wheat) and crops (sunflower) that allow farmers to cultivate moderately saline soils in coastal Bangladesh

Developed crop machinery that reduces tillage for dry season crops from 3 operations to 1 and conserves moisture and organic matter.

Developed irrigation equipment that reduces irrigation costs by a third

Over 90,000 farmers annually trained in rice, wheat, maize or fish production.

44,000 trials and demonstrations on rice, wheat, maize and fish production

Scaled out through $5 million USAID investment salt, submergence and drought tolerant rice varieties to 0.976 million farmers. A further 1.277 million are estimated to have obtained seed through seed purchase and exchange from these farmers.

Scaling out farm machinery for planting, harvesting and processing rice, wheat and maize through $13 million investment by USAID to 490,000 households on 90,000 ha.

Photo: A.K.M Ferdous / CSISA-BD

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