



Sustainable and resilient farming systems intensification in the Eastern Gangetic Plains

Overview

The Eastern Gangetic Plains (EGP) of Bangladesh, India and Nepal is home to some 300 million people, with the world's highest concentration of rural poverty and a strong dependence on agriculture for their food security and livelihoods. The EGP has the potential to become a major contributor to South Asian regional food security, but rice and wheat productivity remain low and diversification is limited because of poorly developed markets, sparse agricultural knowledge and service networks, and inadequate development of available water resources and sustainable production practices. Labour shortages are becoming more acute. These factors lead to smallholder vulnerability to climate and market risks that limit farmer and private sector investments in productivity-enhancing technologies. While there is variation across the EGP, in northwest Bangladesh water policy and agricultural technologies have increased crop yields, however the sustainability of present rates of groundwater use is a concern.

Research

This project addresses two research questions:

1. Would farm management practices based on the principles of conservation agriculture and the efficient use of water resources provide a foundation for increasing smallholder crop productivity and resilience?
2. Would institutional innovations that strengthen adaptive capacity and link farmers to markets and support services enable both women and men farmers to continue to innovate in the face of climate and economic change?

ACIAR project number	CSE/2011/077
Start date and duration (years)	May 2014 (5 years)
Location	Bangladesh, India and Nepal
Budget	AU \$9.7 million

Project leader(s) and Commissioned Organisation

Thakur Prasad Tiwari
 International Maize and Wheat Improvement Center

Partner country project leaders and their institutions

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The overall aim of the project is to reduce poverty in the EGP by improving the productivity, profitability and sustainability of smallholder agriculture. The project has four objectives that will lead towards sustainable and resilient farming systems intensification in the EGP:

- » Understand farmer circumstances with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation.
- » Develop, with farmers more productive and sustainable technologies that are resilient and profitable for smallholders.
- » Catalyse, support and evaluate institutional and policy changes that establish an enabling environment for the adoption of high-impact technologies from Objective 2.
- » Facilitate widespread adoption of sustainable, resilient and more profitable farming systems.

Achievements

- » The project has established 40 innovation platforms (of which 34 are functional), where input dealers, local service providers, and research and development staff work together.
- » Research undertaken during the project indicates that best agronomic practices coupled with new seeds, such as conservation agriculture can increase productivity (5-10%), compared with conventional practices (CP). These technologies and practices as compared to CP have positive economic returns (16-56%), less water (8-17%), less labour (26-44%), and less use of energy (16-62%), along with also lowering the GHG emission (11-16%). These benefits have been realized by almost 101,000 farmers from specific and limited geographical locations.
- » The project has been working through partnerships, which has created a true culture of team work, while National Agricultural Research an Extension Systems partners are now more confident about on-farm research and development. Importantly, some partners now have activities from this project in their regular program, which helps guarantee ownership and sustainability of the project.
- » Nearly one-third (32%) of the 101,723 total beneficiaries were women, including the activities which were integrated into government plans and schemes. Considering the region's socio-politics and culture, this level of participation is encouraging.

Impact story

Bangladesh

Rabiul Islam, his wife and their son live in Kolkondo, a small village in Rangpur district, Bangladesh. They have a small piece of land near their homestead, and a 0.4 ha plot where they used to grow maize in a traditional way (ploughing three to four times before sowing).

When not working on the farm, Mr Islam worked as an unskilled labourer to support his family.

After receiving training in 2013 (during the pre-project activities), Mr Islam first used strip-till technology to grow maize in his field, then to cultivate his neighbours' maize and wheat crops. Farmers using strip-till technology were amazed by their yields of maize and wheat, and neighbours wanted to do the same in next season.

Mr Islam continued to provide services in his available time. He became a skilled machine operator and provided strip-till, bed planting, reaper and mechanical rice transplanting services with support from the project team.

Within two years, he was recognised as a local service provider for the community, and so many farmers approach him for his services that it is now becoming difficult for him to meet demand.

While he previously struggled to support his family, he is now able to save money. In 2016, he earned BDT 40,000 (equivalent to A\$682), which he used to build a new tin-roofed house.

He is now a master trainer, and trains other operators in his and neighbouring districts, and is working towards buying his own power tiller with seed and fertiliser drill.



Caption: Strip-till maize Photographer: Rashadul Islam