



Australian Government

Australian Centre for
International Agricultural Research

Crops

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 300 million people. With the world's highest concentration of rural poverty, communities depend on a strong dependence on agriculture for food security and livelihoods.

The EGP has the potential to become a major contributor to South Asian regional food security. However, 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 also becoming more acute.

These factors lead to smallholder vulnerability, climate and market risks that limit farmer and private sector investments in productivity-enhancing technologies.

The project is a collaboration between the International Maize and Wheat Improvement Centre (CIMMYT), ACIAR, and more than 20 partners representing the research, development and educational sectors. The project is taking place in 40 locations in the EGP – across Bangladesh, India and Nepal – contributing towards sustainable and resilient farming intensification in the region and making smallholder agriculture more productive, profitable and sustainable, while safeguarding the environment, and encouraging women to participate.



KEY FACTS

ACIAR Project No. CSE/2011/077

Duration: May 2014 to June 2020 (6 years)

Target areas: Bangladesh, India, Nepal

Budget: A\$9.7 million

Project leader

Dr Thakur Tiwari, International Maize and Wheat Improvement Center (CIMMYT)

Key partners

- Bangladesh Agricultural Research Council
- Rangpur-Dinajpur Rural Services, Bangladesh
- Indian Council for Agricultural Research
- Bihar Agricultural University, India
- Uttar Banga Krishi Vishwavidyalaya University
- JEEViKA
- Sakhi, Bihar
- Nepal Agricultural Research Council
- Nepal Department of Agriculture
- CSIRO
- Curtin University
- University of Queensland
- University of New England
- International Development Enterprises
- International Food Policy

ACIAR Research Program Manager

Dr Eric Huttner

Objective

The project's specific objectives are to:

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

In the current phase 2018-2020 the project focuses on object 3 and 4.

Outcomes

Technology:

The project promoted conservation agriculture-based system intensification (CASI) technology that helped to change agriculture in the region through: introducing new crop varieties; intensifying and diversifying systems; introducing new crops like maize, wheat or legumes; intercropping vegetables and legumes with maize in new areas; introducing mechanisation-based conservation agriculture; increasing water, energy, labour use efficiencies; building farm women and men's knowledge, skills and capacity; and convergence with national plans/schemes (eg, Bringing Green Revolution in eastern India and the Prime Minister Agriculture Modernisation Project in Nepal).

CASI technology proved more profitable than conventional practices because it reduced production costs (labour use, tillage/seeding time, water use, and total energy inputs). In particular, zero-till wheat and maize in India and Nepal, along with strip-till maize and wheat in Bangladesh, consistently showed higher yield performance and lower production costs, resulting in higher profits.

Research:

Research undertaken in the project indicates that best agronomic practices coupled with new seeds, such as conservation agriculture can increase the productivity (5-10%) over conventional practices. These technologies and practices as compared to conventional practices have positive economic returns (16-56%), use less water (8-17%), less labour (26-44%), and less energy (16-62%), and are also lowering the greenhouse gas emissions (11-16%). These benefits are realized by some 100,000 farmers who benefited from the project.

Partnerships:

The project worked through partnerships, which 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. Some partners have activities from this project in their regular program, which helps guarantee ownership beyond the life of the project.

Gender:

Gender has been a focus of the project since the beginning using a targeted approach such as focus group discussions with women-only groups, conducting field-level trainings and field days near the villages. Nearly one-third (32%) of the 101,723 total beneficiaries were women, including in activities integrated into government plans and schemes. In the context of local social norms, this level of participation is encouraging.

