



Australian Government

Australian Centre for
International Agricultural Research

Crops

Incorporating salt-tolerant wheat and pulses into smallholder farming systems in southern Bangladesh

Overview

The Government of Bangladesh has prioritised its coastal zone as most in need of development. Home to around 40 million people, about one-third of whom live below the poverty line, the region has large areas of flood-prone land with variable levels of salinity and low agricultural production.

This project is part of an initiative that links three ACIAR projects to lift agricultural productivity and rural welfare in the region.

Agriculture in the region centres around the annual cropping of monsoonal rice. While cropping in the dry season (called the rabi season, post monsoon) is profitable, it is limited by land topography/drainage, soil salinity and irrigation availability. Opportunities exist for more profitable dry season cropping by exploiting significant areas of fallow land between rice crops.

In order to increase smallholder household incomes through improved dry season cropping, critical research questions will address: which crops can be grown in non-saline land, and how to replace rice fallows and increase production and profitability in southern Bangladesh; and is it possible to identify variation in salinity tolerance in wheat, key pulses and forages for exploitation in breeding in saline-affected land in southern Bangladesh.



KEY FACTS

ACIAR Project No. CIM/2014/076

Duration: March 2017 to August 2021 (4.5 years)

Target areas: Bangladesh

Budget: A\$2,041,924

Project Leader

William Erskine, The University of Western Australia -
Centre for Plant Genetics and Breeding (PGB)

Key partners

- Commonwealth Scientific Industrial Research Organisation (CSIRO)
- Bangladesh Agricultural University (BAU)
- Bangladesh Agricultural Research Institute (BARI)
- Department of Agricultural Extension (DAE)

ACIAR Research Program Manager

Dr Eric Huttner

Objective

The project's overall aim is to improve smallholder incomes in southern Bangladesh through improved productivity and profitability of dry-season cropping on non-saline land and, with improved saline-tolerant pulses and wheat, on saline land.

The project's specific objectives are to:

- Understand the context for practice change in dry season cropping in southern Bangladesh and establish its evolution as a response to the project.
- Understand and evaluate production technologies for dry season cropping of pulses in saline-free land to increase productivity and profitability in the Barisal division in southern Bangladesh.
- Identify wheat germplasm with salinity tolerance adapted to southern Bangladesh.
- Identify germplasm of pulses and forages with tolerance to salinity and water-logging stress adapted to southern Bangladesh.

Expected scientific results

- International Public Goods shared through jointly-authored research articles to be published in international scientific journals, including publications on water-logging and salinity tolerance in mung bean, cowpea and pea; selection for salinity tolerance traits in wheat using high-throughput imaging platforms; and impacts on household livelihoods of intensified cropping systems.
- Development of greenhouse experimental protocols for characterizing plant response to salinity and waterlogging. These protocols will be applied by scientists at BARI to screen germplasm.
- Designing of technology options to seize opportunities for, and mitigate obstacles to, increased dry-season cropping.
- Access in Australia to novel sources (germplasm) of salinity and waterlogging tolerances in pulses such as mungbean.

Expected outcomes

- Increased utilisation by farmers of fallow land and increased production of pulses and wheat, leading to increased employment opportunities for women, improvements in dietary diversity and enhanced soil health outcomes.
- Researchers with improved understanding of household dynamics in southern Bangladesh.
- Researchers designing gender-sensitive technology options and approaches to technology testing and employing gender appropriate training methods.
- Greater awareness among researchers regarding division of labour and impact of increased productivity/profitability.
- Improved capacity of BARI researchers and DAE staff regarding profitable pulse production in non-saline lands.
- Involvement of private seed company(s)/ farmer groups to produce quality pulse seeds.
- Improved capacity among BARI researchers with modern technology for abiotic stress tolerance breeding and screening.
- Increased confidence of BARI physiologist to advise breeders in future.

