

## Introduction

Agriculture in Asia is far more intensive than on any other continent. It supports about **60%** of the global population on only about **23%** of the world's agricultural land. The average farm size in Asia is small (about 1 ha), and more than **60%** of the land is under rainfed agriculture. The continent accounts for about:

**80%** of the global area under chickpea,  
**87%** of pigeonpea,  
**40%** of groundnut,  
**15%** of sorghum and  
**33%** of millets.

ICRISAT is a recognized global leader in breeding these crops.

Close to **500** improved varieties have been released in Asia (with a focus on India) from ICRISAT-bred materials through partnerships with other countries in the South Asian Association for Regional Cooperation (SAARC) and the Association of Southeast Asian Nations (ASEAN). These have directly contributed to increased crop productivity, improved climate resilience of cropping systems and increased incomes for farmers.



## India

ICRISAT and the Government of India have a long-standing partnership spanning several decades. The Institute's research has contributed to the Government's mission of strengthening agriculture and overcoming malnutrition. The UN endorsement of India's proposal for declaring 2023 as the "**International Year of Millets**" is an example of the outcome of this partnership.

ICRISAT scientists, along with partners, have worked to develop better pearl millet, improve seed production and upscale efforts to encourage its adoption among resource-poor farmers in the drylands. This is aimed at generating higher incomes through better yields. By 2010, pearl millet hybrid HHB 67 Improved was grown on more than **850,000 ha**, attesting to its success and acceptance among farmers.

ICRISAT has worked with many governments exemplified by a partnership with the Government of Karnataka, to design, develop, and implement a project called **Bhoochetana** (Revival of the soil). Starting with six districts and 200,000 farmers, the project reached **over 26,000** villages and **4.2 million** farmers over nine years.



## China

Ties between ICRISAT and China were established in May 1988 when the Chinese Academy of Agricultural Sciences (CAAS) and ICRISAT signed a Memorandum of Understanding (MoU). ICRISAT partnered with the Beijing Genomics Institute (BGI), Liaoning Academy of Agricultural Sciences (LAAS), Guizhou Academy of Agricultural Sciences (GZAAS), and Guangxi Academy of Agricultural Sciences (GXAAS) to enable the poor to move beyond subsistence farming through better agricultural practices.

### Notable projects:

- **2005 – 2009:** Enhanced utilization of **sorghum and pearl millet grain** in the poultry feed industry to improve the livelihoods of small-scale farmers in Asia, funded by the Common Fund for Commodities (CFC)
- **2010 – 2013:** Enhancing **livelihood opportunities of smallholders** in Asia: Linking smallholder sweet sorghum farmers to the bioethanol industry, funded by the Common Fund for Commodities (CFC), and the Food and Agriculture Organization of the United Nations (FAO).



## Myanmar

ICRISAT's partnership with Myanmar's Department of Agricultural Research (DAR) and the Myanmar Agriculture Service (MAS) under the Ministry of Agriculture and Irrigation, goes back to 1976. The partnership was strengthened by the participation of scientists from Myanmar in the Cereals and Legumes Asia Network (CLAN) led by ICRISAT. The first MoU between the two entities was signed in 1986. Over the last 40 years, ICRISAT has worked with DAR to modernize Myanmar's crop improvement programs, increasing genetic gains and enhancing operational efficiency. From extra-large-seeded kabuli chickpea and early-maturing pigeonpea, high-oleic acid groundnut to biofortified sorghum, crops with several beneficial traits were developed and promoted.

- **Chickpea revolution in Myanmar:** Production increased nearly eightfold (from 67,000 tons in 1998 to **527,000 tons** in 2017) due to a **300%** increase in area (101,000 to **376,000 ha**) and a doubling of productivity (660 to **1,400 kg/ha**).
- **Nutrition studies in Myanmar School Feeding Program:** Millets and pigeonpea were tested for consumer acceptance. A feeding program for children under the age of two showed that dietary diversification with these crops **improved the nutritional status** of infants.



## Philippines

Since 1975, ICRISAT has actively collaborated with the **Philippine National Agricultural Research and Extension System (NARES)**. In 2004, ICRISAT signed a Memorandum of Agreement with the Department of Agriculture – Bureau of Agricultural Research (DA-BAR) to collaborate on enhancing the adoption of legume technologies in the Philippines. ICRISAT has provided germplasm of groundnut, pigeonpea, chickpea, and sorghum (including sweet sorghum) for commercialization. ICRISAT was instrumental in two successful initiatives:

- Groundnut variety Asha for large-scale commercialization in select regions of the Philippines
- Bhoochetana watershed management approach was upscaled in three pilot provinces - Quezon, Zambaoanga and Leyte.




## Japan

**2009 – 2014:** The research project "**Development of sustainable soil fertility management for sorghum and sweet sorghum through effective use of biological nitrification inhibition (BNI)**" was funded by the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) and conducted at ICRISAT. This research was done in collaboration with the Japan International Research Center for Agricultural Sciences (JIRCAS).



## Vietnam

ICRISAT, in collaboration with the Ministry of Agriculture and Rural Development (MARD) and the Vietnam Academy of Agricultural Sciences (VAAS), worked on the development of the following:

- biofuel supply chains
- integrated watershed management
- strategies for adaptation to climate change
- improved crop cultivars and technologies

ICRISAT has been instrumental in developing the groundnut value chain in Vietnam since 1991. It not only supplied the breeding materials but also provided targeted support and training.

### Notable projects:

- **2002 – 2006:** Farmer participatory improvement of grain legumes in rainfed Asia, funded by the International Fund for Agricultural Development
- **2008 – 2011:** Vulnerability to climate change: adaptation strategies and layers of change, supported by the Asian Development Bank (ADB)

