CROPS TO END HUNGER

Background

With food demand expected to double in low-income countries by 2050, the world needs to produce more and better food to reduce poverty and improve nutrition. Developing the right crop varieties is vital to match increasing food demand, pests, diseases and new environmental challenges linked to climate change. Breeding is slow magic. It takes 6-15 years to develop new varieties and investments in breeding take many years to produce useful outputs. However, the dividends continue to flow for many decades.

> **10:1 benefit-cost ratio:** Investments in CGIAR/ NARS Research and Development (mainly crop breeding) have generated a benefit-cost ratio (BCR) of 10 to 1 over the past five decades.

What is CtEH?

Crops to End Hunger (CtEH) is a multi-donor CGIAR initiative that aims to accelerate and modernize the development, delivery and widescale use of a steady stream of new crop varieties at the CGIAR, the world's largest global agricultural research network. These new varieties are developed to meet the food, nutrition and income needs of smallholder producers and poor consumers in vulnerable regions worldwide.

CtEH funders

CtEH launched in 2018-19, bringing together a multi-Funder consortium, consisting of German Federal Ministry for Economic Cooperation and Development (BMZ), the United States Agency for International Development (USAID), the Bill & Melinda Gates Foundation (BMGF), the UK Department for International Development (DFID), and the Australian Centre for International Agricultural Research (ACIAR).

Role of GIZ/BMZ

BMZ is the largest CtEH contributor, with its funds being implemented by GIZ. As of end 2020, BMZ contributed nearly 32,4 Million EUR to CtEH, which is approximately 87% of the total CtEH investments contributed by all Funders in the consortium.

How it works

To boost crop productivity and climate change adaptation, CtEH tasked the CGIAR Excellence in Breeding (EiB) platform to support breeding networks of CGIAR and NARS (national agricultural research systems) to deliver higher rates of genetic gain and varietal turnover. To do so, they must modernize and optimize their programs through defining market segments, developing product profiles, quantitatively optimizing their breeding pipelines, accessing centralized services, improving their breeding operations, and using the best breeding informatics tools to make decisions.

Glossary

Genetic gain is an indicator for a breeder's progress in creating adapted plants with new combinations of specific desirable traits.

Varietal turnover is the rate at which farmers replace the seed they use with modern varieties that were released more recently.

Market segment is the geographic area or a group of people (farmers, food processors, customers) with similar needs and preferences for a crop variety.

Breeding pipeline is the sum of activities focused on creating a new variety targeted at a particular market segment.

Product profile is a set of targeted attributes (traits) which a new plant variety is expected to meet to be released onto and adopted by a market segment, such as yield, disease tolerance, cooking quality, taste.

Genotyping: Technology that detects small genetic differences in the DNA of a plant that can lead to changes in phenotype.

Phenotyping: The assessment of how a plant looks and performs in the field.

95 low- and middle-income countries being served by CtEH supported breeding programs

615.000.000+
people living in poverty
(less than $1.90/day) living
within market segments
served by CtEH-supported
breeding programs

640.000.000+
undernourished people
(as defined by FAO) living
within market segments
served by CtEH-supported
breeding programs

SUCCESS: Program improvement

1 **78 international and national institutions** using shared services, including genotyping, biometric support, and breeding scheme optimization support.

2 For the first time, **all CGIAR breeding pipelines and market segments were identified:**
- **350 unique sub-regional market segments and**
- **135 CGIAR breeding pipelines.**

By better aligning breeding pipelines, market segments and product profiles, investments can better target geographies, crops and demographics to improve food security and livelihoods in priority areas.

Priority Crops	Number of Market segments	Number of pipelines
Cassava	28	11
Durum wheat	21	9
Maize	29	20
Rice	89	19
Spring wheat	34	7
Winter wheat	9	4

3 **400+ digitization devices provided to 24 NARS & CGIAR breeding programs:** The equipment (seed counters, label printers, handheld data collectors, tablets, package printers) helps speed up and enhance the accuracy of various breeding processes including seed preparation, data collection, data analysis and inventory management.

4 **25 % annual increase in sample processing** for shared Low-density SNP Genotyping (LDSG) services. Major crops serviced include wheat, maize, rice, cassava, potato, cowpea and soybean. Looking at the DNA of each plant by genotyping reduces cost and time for breeders who would otherwise test the performance of thousands of plants in different environments.

Seed counter