Kenya has recently acquired lower-middle-income status, but the increased wealth has not benefited all Kenyans equally. Over one third of the population still lives under the international poverty line and social, economic and gender disparities remain.

According to the World Food Programme, access to adequate nutritious food remains a challenge for many, especially in arid and semi-arid regions, which make up 80% of the country’s land area. Factors include rapid population growth – at a rate of 2.9% a year – climate change, stagnating agricultural production and inefficient food systems. Food insecure families typically live in rural areas, are poor and depend on daily agricultural labor for their income. Malnutrition remains unacceptably high, with stunting experienced by 29% of children in rural areas and 20% of those living in cities.

Agriculture remains the main economic driver but is highly vulnerable to climate shocks. Unpredictable rainfall and recurring droughts contribute to the disruption of crops, 95% of which are rainfed, along with the erosion of soils.

To build resilient livelihoods, ICRISAT provides farmers with climate-smart agricultural technologies and improved varieties of dryland crops, namely, sorghum, pearl millet, finger millet, groundnut, pigeonpea and chickpea. Some of the traits developed include drought tolerance, short to medium maturity duration, low external inputs requirements, climate-change resilience and nutrient recycling.

ICRISAT’s office in Kenya is the regional hub for Eastern and Southern Africa (ESA) which works with other ICRISAT offices in Ethiopia, Kenya, Zimbabwe, Malawi and Mozambique.
Partnerships

ICRISAT’s association with Kenya started in 1981 with the Semi-Arid Food Grain Research and Development Program (SAFGRAD), largely funded by the United States Agency for International Development (USAID).

Key completed projects

- **2007-2015**: Tropical Legumes I & II, and from 2009 Harnessing Opportunities for Productivity Enhancement (HOPE), both funded by the Bill & Melinda Gates Foundation.
- **2013-2015**: Development of a robust commercially sustainable Sorghum for Multiple Uses (SMU) value chains in Kenya and Tanzania funded by European Community and the International Fund for Agricultural Development (IFAD).
- **2017-2020**: Strengthening Sorghum and Millet Value Chains for Food, Nutritional and Income Security in Arid and Semi-Arid Lands of Kenya and Tanzania (SOMNI) funded by IFAD.
- **2015-2021**: Accelerated Value Chain Development of Drought Tolerant Crops (AVCD-DTC) funded by Feed the Future (USAID).

Ongoing projects

- **2021-2024 (Sep)**: Accelerated Institutional and funding Food Systems Development Program (AIFSD) funded by Feed the Future (USAID).
- **2021-2023 (Dec)**: Accelerating the Impact of CGIAR Climate Research in Africa (AICCRA) funded by the World Bank through the International Development Association (IDA).

ICRISAT works with various partners including the Kenya Agricultural Livestock and Research Organizations (KARLO), Ministry of Agriculture, Livestock Fisheries and Cooperatives (MoALF), National and County governments, Egerton University, Kenya Seed, CGIAR centers, NGOs, development partners, and the private sector to meet the goals of improving food and nutritional security, alleviating poverty and safeguarding the environment.

Farmers receive pigeonpea seed packs in Makueni county, Kenya.

Milestones

1. Promotion of improved drought tolerant varieties

Global Research Program: Accelerated Crop Improvement

A total of 52 improved varieties and hybrids comprising of sorghum (21), pearl millet (1), finger millet (8), chickpea (10), pigeonpea (8), and groundnut (4) were released in Kenya as of 2021.

- **430 tons** of seed of drought tolerant crops were produced by community seed producers. Seed production involved establishment of 40 community seed banks.
- **153,000** households received improved seeds of different drought tolerant crops.
- **364** model farms were established across 7 counties.
- Farmers growing the improved varieties registered higher yield. For example, sorghum yield increased from 0.7 t/ha to 2.0 t/ha, finger millet yield increased from 0.6 t/ha to 1.5 t/ha and pearl millet yield improved from an average of 0.5 t/ha to 1.2 t/ha.
- Cultivation of the snapping finger millet variety has resulted in increased production from an average of 0.5 acres per household to 1.0 acres.

Several projects have led to the development of varieties with traits preferred by farmers and markets and increased awareness and adoption of ICRISAT crops. Sorghum and millets have market demand in the brewing and animal feed industries, which provide an enormous opportunity for improving the income of farmers.

A farmer buying seed from the community seed bank.
2. Value addition and improved nutrition
Global Research Program: Enabling Systems Transformation

**Nutrition:** ICRISAT has validated and is promoting consumption of finger millet, pearl millet and sorghum. Products include bakery and confectionery items such as biscuits, cakes, bread and crackles; cooked dishes like sorghum/pearl millet ‘rice’ and porridges; and both brewed and non-alcoholic drinks. Sorghum and millets contain important macro and micronutrients that make them healthier staples compared to maize.

- The health of children (below 5 years and of school-going age) and women (breast feeding and expectant mothers) had improved according to a survey report of households targeted for interventions in eastern Kenya.

**Improved post-harvest handling of dryland cereals:** ICRISAT in collaboration with local fabricators is promoting affordable and efficient mechanical and motorized threshing machines to reduce manual labor and traditional wasteful post-harvest methods. Mechanization of post-harvest operations benefits women and children, on whom the burden usually falls on. Grain that is free of stones and sand fetches a higher price in markets. Women are the target beneficiaries for ICRISAT’s interventions such as threshers.

**Sustainable value chains:** The SOMNI project scaled up commercially sustainable dryland cereal-based value chains for 15,793 beneficiaries in 466 groups comprising producers, processors, grain traders, produce transporters, agro-dealers, seed producers, seed companies, crop protection companies, farm equipment fabricators and credit and finance service providers. A total of 121 extension officers were trained as Trainers of Trainers (TOTs) to enhance outreach to train farmers closer to their homes.

**Hybrid Parents Research Consortium:** The formation of a sorghum and pearl millet hybrid parents research consortium was initiated in Kenya by the Seed Traders Association of Kenya (STAK) and ICRISAT in 2015. This is a public-private partnership approach to building the seed industry for the supply of higher performing hybrids. Having ready hybrid parents shortens the time taken by seed companies to develop new hybrids.

3. Soil, water and climate interventions
Global Research Program: Resilient Farm and Food Systems

**Watershed management:** Farmers have been trained in better soil and water conservation practices (check dams and tied ridges) and climate-smart agronomic practices such as tumbukiza pits (where farmers plant grass in pits to sustain soil fertility and moisture, and to have optimum utilization of the available land) to establish grass and forage trees.

Representatives from Kenyan seed companies participate in a field day at the Kiboko Research Facility in Makindu to know more about sorghum hybrid parents developed by ICRISAT.
Digital tools for Climate Smart Agriculture (CSA):
An ongoing World Bank funded project is working on
knowledge generation and sharing of effective climate
information services, partnerships for delivery, and
supporting the uptake of CSA innovations through
piloting. So far, the project has achieved:
▪ A prototype of AgDataHub, the AICCRA Dashboard is
developed and deployed
▪ Training manual developed on choice of crop varieties
  and associated CSA packages
▪ Climate analysis in Makueni, Kitui and Taita Taveta
  counties using observed and gridded data
▪ Framework developed for integrating Computer
  Information Systems and tools into the data hub

Looking to the Future
ICRISAT’s Strategic Plan 2021-2025 envisions
prosperous, food secure and resilient dryland tropics
and aligns with the Kenyan government’s efforts
towards achieving food security, which is one of the
four pillars of the Big 4 Agenda. ICRISAT and its
partners will continue to develop and deliver
scientifically proven technologies and innovations to
contribute to resilient agri-food systems in the Arid and
Semi-Arid Lands (ASALs). Efforts will be made towards
development of technologies (improved crop varieties
and agronomic management), markets and institutions
to advance the value chains of grain legumes, sorghum
and millets due to their health benefits and their
suitability for cultivation under harsh conditions marked
by climate change. ICRISAT will leverage on its
Agribusiness and Innovation Platform experience to
build crop value chains that create job opportunities for
women and youth. ICRISAT is committed to engaging
the public and private sectors and other key
stakeholders while leveraging global opportunities such
as the 2023 International Year of Millets to continue
creating sustainable agri-food systems in the arid and
semi-arid areas.