We believe all people have a right to nutritious food and a better livelihood.

Delivering nutrition to the drylands

ICRISAT Annual Report 2017
Research Highlights | Contribution to country strategies

**Mali**
Accelerating agricultural growth and family farming
- Use of satellite imagery technology (Sentinel-2 Agriculture): >200% increase in the number of farm plots amenable to earth observation monitoring
- Benefits from improved varieties

**Ethiopia**
Increasing yields and market integration
- Yields increased from 1,000 to 3,200 kg/ha
- Chickpea farmers in Sodo and Wolayita earn an average extra income of US$ 127 per annum

**India**
Doubling Farmers’ Income and managing watersheds
- CSR watershed pilot sites record 100% increase in farmers’ income in Karnataka, Andhra Pradesh, Telangana, Maharashtra and Odisha
- India’s Doubling Farmers’ Income program: Projects were identified in 18 districts in Maharashtra and Uttar Pradesh states based on past CSR successes

**Niger**
Reducing malnutrition and land degradation
- Bioreclamation of degraded land (BDL)
- Benefit to women
- US$ 500–800 from a 0.02 ha plot
- BDL technology dissemination
- 10,770 farmers reached in 170 villages in 5 years

**Nigeria**
Increasing domestic food supply and creating jobs
- 10,000 undergo agribusiness training, includes 4,662 youth and women farmers and small-scale processors
- Benefits from improved varieties

**Zimbabwe**
Climate resilience and improved food security
- A study in Nkati using a multi-model framework forecasts that
- 65% of farming households may suffer from climate change.
- Groundnut have been identified as an opportunity to increase income for the poorest

**Malawi**
Reducing hunger and poverty
- Impact of newly-introduced ‘Double up legume technology’ (intercropping pigeonpea and groundnut)
- 800–1,100 kg/ha yield increase

**Kenya**
Focus on women and youth
- Diversifying diets and creating a market pull for traditional grains
- Over 45 years, ICRISAT has worked closely with national partners along value chains of its nutritious and climate-smart mandate crops – sorghum, pearl and finger millet, chickpea, pigeonpea and groundnut – to ensure our science improves the lives of farmers and nutrition for all consumers.

**Outputs contributing to global impact**

- Genetic gains
  - Pearl millet genome decoded and sequenced
  - Near aflatoxin-immune groundnut developed

- Genebank
  - 12,514 seed samples distributed in 19 countries
  - 2,117 unique germplasm accessions assembled from regional genebanks

- Crop improvement
  - 23 varieties released in 6 countries

- Digital agriculture
  - Plantix (plant disease/deficiency diagnostic app)
  - Agricultural start-ups incubated

- Seed production
  - 14,261 tons of seed of ICRISAT mandate crops shared with farmer groups, NARS and NGOs

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Delivering Nutrition to the Drylands

Integrating nutrition across the agricultural R4D value chain: This graphic represents ICRISAT’s holistic approach – working from land and water management all the way through to agribusiness and market development. Here are examples of how we have integrated nutrition at each stage.

1. Testing approaches to better nutrition

- 179 mothers of malnourished children in rural Malawi were trained in diet diversity, hygiene and food safety. They were also trained to record the anthropometric data of their babies.
- 21 days later, incidence of diarrhoea almost entirely disappeared, impact on wasting showed progressive improvements. Published in the Journal of Public Health Nutrition, Cambridge University Press.

2. Healthy soils, healthy crops, healthy people

- Soil health testing and use of treated wastewater
  - 300 locations in Asia & Africa under watershed development projects follow soil health protocols
  - 20,000 liters of wastewater is regenerated everyday by a processing unit set up in Kothapally, Telangana, India.
- Untreated wastewater, often used by farmers, comes with serious health risks

3. Breeding solutions for malnutrition and food safety

- Biofortification
  - 1 high-iron pearl millet cultivar released in India (2013)
  - 2 high-iron, high-zinc pearl millet cultivars released (2017)
- Near aflatoxin-immune groundnut developed (2017)

4. Driving diet diversity from farms to homes

- Increase in dietary diversity in a year, recorded in a Kenyan project
  - 100% Children
  - 20% Women/households
- ICRISAT mandate crops were used in this project

5. Technologies for safer food and higher yields

- >5 billion people at risk of aflatoxin exposure
- On-farm management techniques helped reduce contamination by:
  - 70-84% 62-94%
- High-oleic acid groundnut released in India (2013)
- High-iron, high-zinc pearl millet cultivated released in 2017
- Near aflatoxin-immune groundnut developed
- High-iron, high-zinc pearl millet cultivated released

6. Food processing trainings for better livelihoods

- Volunteer students trained on processing sorghum
  - 150 girls 50 boys trained through a project in Nigeria.
  - The grain was used as the harvest from their school farms.
  - The trainings instilled the idea of seeing farming as a business rather than an activity for subsistence living.

7. Inclusive Market-Oriented Development

- Agribusiness & Innovation Platform (AIP) has supported start-ups
  - 186 in Africa 87 in India (as of 2017)
- ICRISAT trained six South African interns. This resulted in the Gog’Lilly brand of confectionery peanuts and peanut butter making it to the market in 18 months.

8. Building demand for more nutritious food

- Smart Food initiative
  - Launched in 2013, it aims to popularize millets and legumes and build food systems where the food is good for you (highly nutritious), good for the planet and good for the smallholder farmer.
- Reality TV show
  - 800,000+ viewers per episode

Food processing trainings for better livelihoods

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Nutrition milestones across 45 years

Landmarks

- 1975: Focus on food security
- 1976: Watershed projects pilot a holistic food systems approach
- 1997: Partnership with private seed companies through HRC
- 2000: Agri-Business Incubation program started
- 2006: Studies on hidden hunger
- 2007: Plant nutritional genomics introduced
- 2013: Smart Food initiative launched
- 2014: Emphasis on sustainable agri-food systems
- 2016: Near aflatoxin-immune groundnut developed
- 2017: High-iron, high-zinc pearl millet cultivars released

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Communication initiatives

Smart Food initiative

ICRISAT timeline

Media coverage

ICRISAT timeline

45 years of innovation

Science of Discovery to Science of Delivery

Read the full report: annualreport2017.icrisat.org

Read the full report: annualreport2017.icrisat.org

ICRISAT Governing Board

Aistou Cuisine becomes Smart Food Ambassador

A 13-episode Smart Food reality TV show was hosted by the Kenya Television Network, to raise awareness on sorghum, millets and legumes.

The Smart Food initiative was selected as one of the winning innovations for 2017 by LAUNCH Food which is supported by the U.S. Agency for International Development and the Australian Government.
**Vision**
A prosperous, food-secure and resilient dryland tropics

**Mission**
To reduce poverty, hunger, malnutrition and environmental degradation in the dryland tropics

**Approach**
Inclusive Market-Oriented Development (IMOD)

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**Research Programs**

West & Central Africa
- Niger
- Nigeria
- Mali

Eastern & Southern Africa
- Malawi
- Ethiopia
- Zimbabwe
- Kenya

Asia
- Crop Improvement
- Integrated Crop Management
- Policy and Impact
- Plant Quarantine Unit
- ICRISAT Development Center
- Farm and Engineering Services

Innovation Systems for the Drylands
- Agribusiness and Innovation Platform
- System Analysis for Climate Smart Agriculture
- Monitoring, Evaluation, Impact & Learning
- Digital Agriculture & Youth
- Markets, Institutions, Nutrition & Diversity

Genetic Gains
- Genebank
- Pre-breeding
- Cell, Molecular Biology & Genetic Engineering
- Genomics & Trait Discovery
- Forward Breeding
- Seed Systems
- ESA-Biotechnology
- Systems Biology

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ICRISAT offices: HQ - Hyderabad, India; New Delhi, India; Bamako, Mali; Niamey, Niger; Kano, Nigeria; Bulawayo, Zimbabwe; Addis Ababa, Ethiopia; Nairobi, Kenya; Lilongwe, Malawi; Maputo, Mozambique.

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Front cover photo: C. Wangari, ICRISAT
Caption: Ms Elizabeth Kanyote and her 17-month-old daughter Seth Mukiri from Tharaka Nithi county in Kenya are among the over 6,000 participants of nutrition training under the Smart Food initiative in Kenya. These activities are supported by the United States Agency for International Development, Feed the Future Kenya Accelerated Value Chain Program.

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Our work contributes towards the following SDGs

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