



Delivering nutrition to the drylands

ICRISAT Annual Report 2017

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



INTERNATIONAL CROPS RESEARCH
INSTITUTE FOR THE SEMI-ARID TROPICS



ICRISAT is a member of the
CGIAR System Organization



Message from the Board Chair

Research in ICRISAT is unique and multidisciplinary and it delivers so much to so many vulnerable people who live in a very fragile environment. Resilient nutrition is extremely important for dryland communities and moving from 2018 and beyond, I am delighted that ICRISAT is putting an increased emphasis on nutritional research.

– Nigel Wells Kerby



Message from the Director General

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. Special appreciation to our partners and funders and to the many farmers who contributed to the design, development and delivery of demand-driven innovation for the drylands during 2017.

– David Bergvinson



For Research Highlights over 45 years, [click here](#)

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**



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**

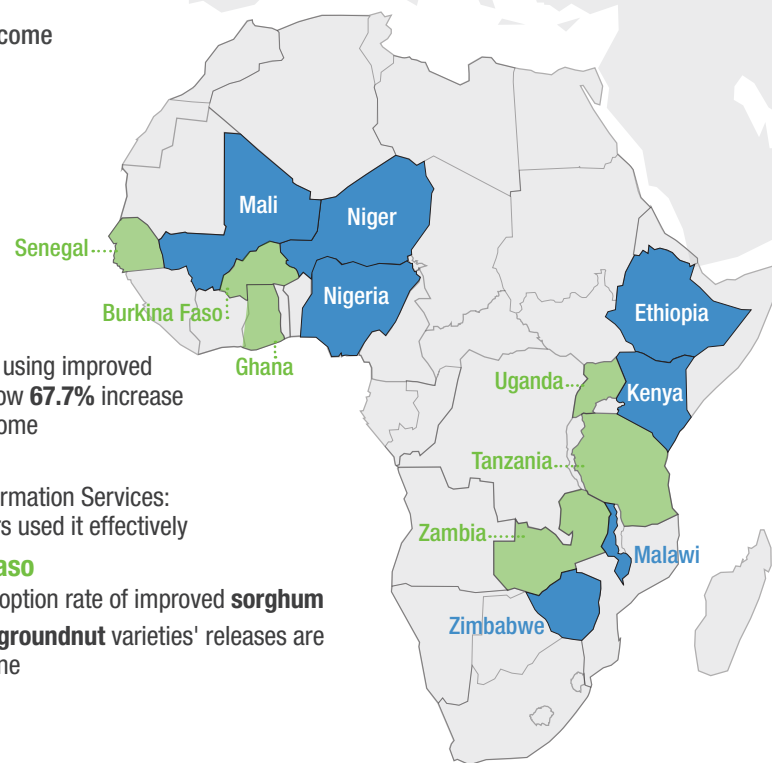


Ethiopia Increasing yields and market integration

> 51,000 chickpea farmers reached (about 30% are women)

▶ **Yield 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



Ghana
Households using improved varieties show **67.7%** increase in gross income

Senegal
Climate Information Services: **96%** farmers used it effectively

Burkina Faso
15.7% – Adoption rate of improved sorghum
4 best-bet groundnut varieties' releases are in the pipeline



Zimbabwe Climate resilience and improved food security

A study in Nkayi using a multi-model framework forecasts that

▶ 65% of farming households may suffer from climate change. Groundnuts have been identified as an opportunity to increase income for the poorest

130-200% improvement in yields can be achieved through improved groundnut crop management practices



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

*Corporate Social Responsibility

▶ **India's Doubling Farmers' Income program:**

Projects were identified in **18 districts** in Maharashtra and Uttar Pradesh states based on past CSR successes.



Myanmar ICRISAT-origin varieties as of 2017

9 out of 10 varieties

6 out of 9 varieties

5 out of 10 varieties

Bangladesh

Heat-tolerant chickpea variety released

Tanzania

2 stress-tolerant groundnut varieties of ICRISAT origin have been prioritized for production. Seed companies, farmer groups and agro-dealers are being mobilized for better production

Uganda

Groundnut seed roadmap designed to produce and deliver by 2019 – **267 tons** of basic seed and **4,000 tons** of certified/quality declared seed

Zambia

Groundnut seed production: 27.5 tons (against a target of 23.2 tons)

Mandate crops

- Sorghum
- Groundnut
- Pearl millet
- Pigeonpea
- Chickpea
- Finger millet

ICRISAT locations

- Major countries
- Other key areas



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**

>100,000

households reached with nutrition messages

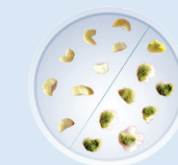
> 6,000 women farmers introduced to new recipes and energy-efficient innovations

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**

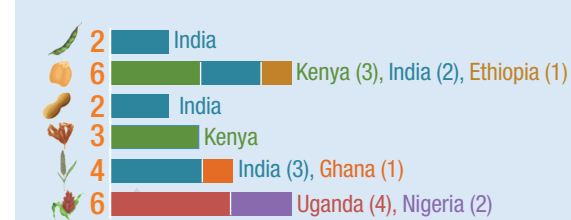
2,117

unique germplasm accessions assembled from regional genebanks



Crop improvement

23 varieties released in 6 countries



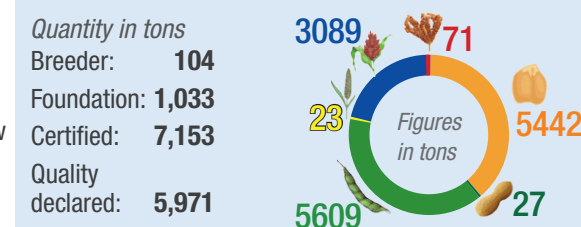
Digital agriculture

iHub (agri-tech incubator launched in early 2017)
9 start-ups incubated

Plantix (plant disease/deficiency diagnostic app)
1,400,000 downloads by farmers across 4 Indian states

Seed production

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



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.

A food package of pigeonpea, finger millet, groundnut, maize and vegetables was tested on children.



Ms Gladys Mugambi (R), Head of Nutrition, Ministry of Health, Kenya, congratulates Ms Esther Atieno, winner of the Smart Food contest.

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
Hosted by the Kenya Television Network to raise awareness on sorghum, millets and legumes.

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.

*As part of the UniBRAIN project in partnership with Forum for Agricultural Research in Africa from 2012-2016



Gog'Lilly team: (L-R) Ms Pretty Aphane, Ms Mbali Zondo and Mr Page Baloyi.

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 used was the harvest from their school farms.

▶ The trainings instilled the idea of seeing farming as a business rather than an activity for subsistence living.



Students of the Government Secondary School, Rano, operating the hammer mill.



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**



Using treated wastewater, S Sailu grew crops all year through. Last summer, he harvested 600 kg sorghum from 0.1 ha.

3 Breeding solutions for malnutrition and food safety

▶ **Biofortification**

1 high-iron pearl millet cultivar released in India (2013)

2 high-iron sorghum cultivars released in Nigeria (2017)

4 high-iron, high-zinc pearl millet biofortified cultivars released (2017)

Bioavailability studies were conducted on biofortified pearl millet variety ICTP 8203 Fe.

▶ Near aflatoxin-immune groundnut developed (2017)



School children in Maharashtra, India, eating high-iron pearl millet flatbread as part of their midday meal.

4 Driving diet diversity from farms to homes

▶ **Increase in dietary diversity in a year**, recorded in a Kenyan project

Children 100%↑ | **Women/households 20%↑**

ICRISAT mandate crops were used in this project



Ms Elizabeth Kanyote feeds her 17-month-old daughter sprouted pearl millet porridge in Kenya.

5 Technologies for safer food and higher yields

>5 billion people at **risk of aflatoxin** exposure

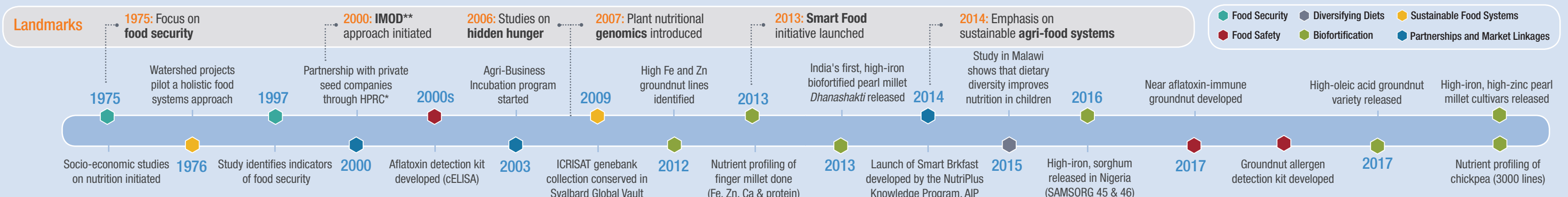
On-farm management techniques helped reduce contamination by:

70-84% in Mali (2003-2005) | **62-94%** in Anantapur, India (2013-2015)



Groundnut varieties and books on aflatoxin control on display at a field day in Mali.

Nutrition milestones across 45 years



* Hybrid Parents Research Consortium; ** Inclusive Market-Oriented Development

Communication initiatives

Smart Food initiative



Wins top 10 Global Food Innovation

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 Department of Foreign Affairs and Trade.



800,000 viewers per episode for reality TV show

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



Aistou Cuisine becomes Smart Food Ambassador

Senegalese chef based in Paris, Aistou Cuisine, developed recipes and championed Smart Food benefits through her social media.

473,222 people reached | 876,437 impressions | 5 videos produced
219,000 views | 85,657 minutes of views

ICRISAT timeline



Media coverage

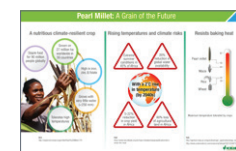
423 regional news posts

58 global news placements, includes coverage in:

- BBC
- The Guardian
- Thomson Reuters Foundation News
- Jamie Oliver's Food Revolution
- The Huffington Post



27 Infographics



100 Voices

19 videos in Youth in Agribusiness series

TAKE2 Highlights of Science Seminars

3 videos

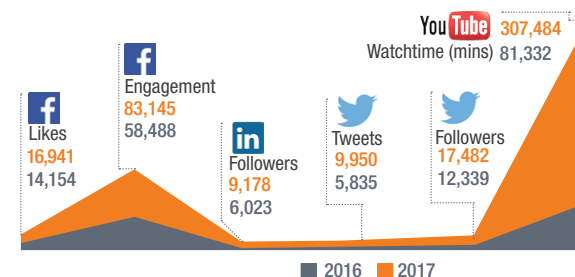
Agri-buzz

19 new blog posts

418 Research publications

- 201 Papers in ISI/Thomson Reuters listed journals
- 14 Monographs
- 38 Book chapters
- 8 Books and journal volumes
- 99 Papers in other peer-reviewed journals
- 53 Conference proceedings
- 5 Socio-economics discussion paper series

Social media



Our people

ICRISAT Governing Board

- Nigel Wells Kerby**, Britain, Chair, ICRISAT GB (From May 2017)
- Chandra A Madramootoo**, Canada, Chair, ICRISAT GB (Till April 2017)
- Trilochan Mohapatra**, India, Vice Chair, ICRISAT GB
- David Bergvinson**, Canada, Director General, ICRISAT
- Rachel K Chikwamba**, South Africa
- Sissel Rogne**, Norway
- Wendy Umberger**, Australia
- Oluwande Muoyo**, Nigeria
- Paul C Anderson**, USA
- Paco Sereme**, Burkina Faso
- Laurie Tollefson**, Canada
- Shobhana Pattanayak**, India
- SP Singh**, India (from Jan 2017)

Staff

26 Nationalities

- 6 USA, Europe and Australia
- 4 Asia and Southeast Asia
- 9 West and Central Africa
- 7 Eastern and Southern Africa

Age

- 37% 31-40 years
- 17% upto 30 years
- 20% 41-50 years
- 26% 51+ years

Gender

- ♂ 80%
- ♀ 20%

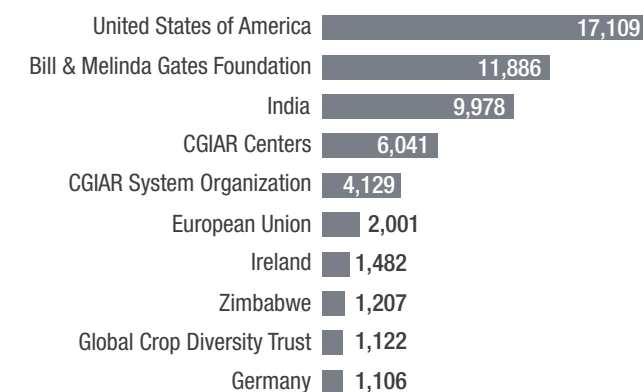
Knowledge sharing

355 Learner participants

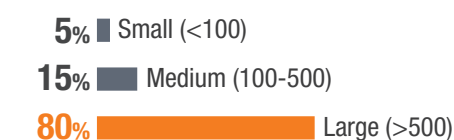
- 46% Interns
- 44% Scholars
- 10% Fellows

Financial summary

Top Ten Donors for 2017 (in US\$ thousands)



Contribution to grant revenue by project size (in US\$ thousands)



in US\$ thousands

Balance Sheet		
	2017	2016
Assets		
Cash and Cash Equivalents	22,221	22,882
Investments	31,812	44,961
Accounts Receivable	17,408	15,811
Inventories	610	702
Prepaid Expenses	346	295
Property, Plant and Equipment	7,418	7,654
Other Assets	3,212	2,884
Total Assets	83,027	95,189
Liabilities		
Accounts Payable	9,534	10,858
Accruals and Provisions	2,913	2,157
Deferred income from Donors	23,523	31,629
Employees Payables/Provisions	2,714	3,695
Total Liabilities	38,684	48,339
Net Assets		
Unrestricted Net Assets		
- Undesignated	18,664	20,385
- Designated	21,113	21,113
Restricted Net Assets	4,058	4,061
Temporary Net Assets - Other Comprehensive Income	508	1,291
Total Net Assets	44,343	46,850
Total Liabilities & Net Assets	83,027	95,189

Vision

A prosperous, food-secure and resilient dryland tropics

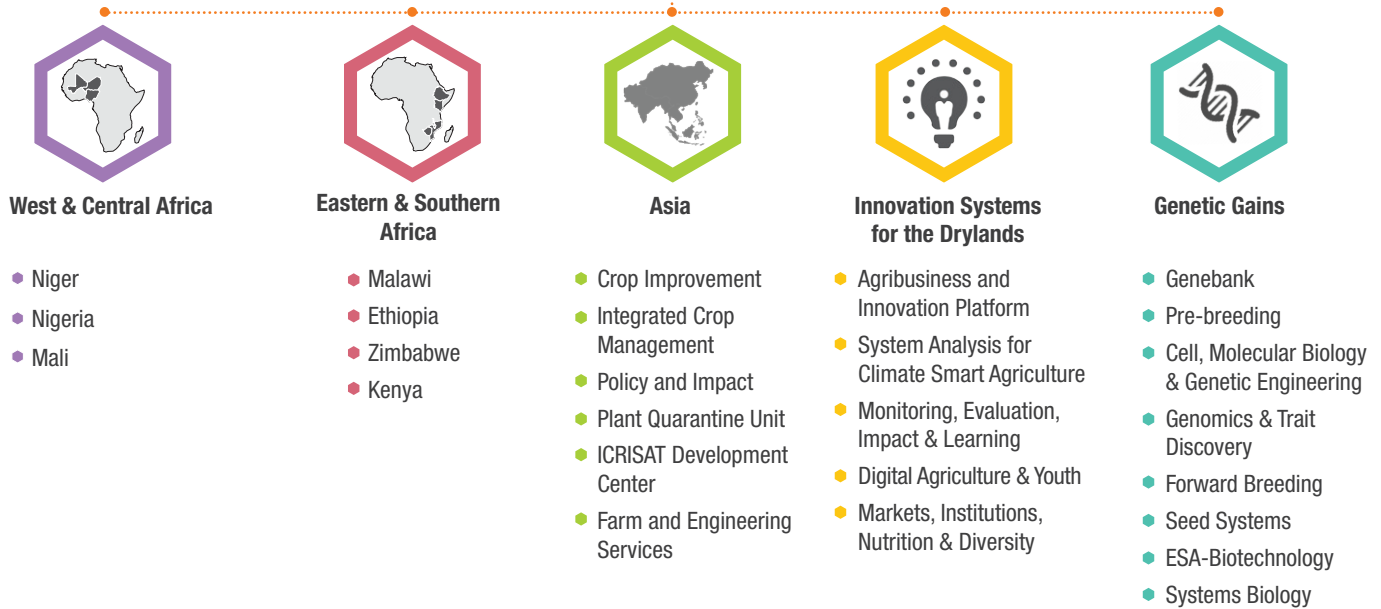
Mission

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

Approach

Inclusive Market-Oriented Development (IMOD)

Research Programs



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

