Research Highlights - Quick Stats

A world without hunger is what ICRISAT envisions. With an ever-increasing population, the year 2019 saw us pursue this vision with greater vigor. **Mainstreaming nutrition** and **modernizing the breeding program** were top priorities even as we roped in the best of genomic and digital technologies to increase efficiencies and deliver improved farmer-preferred varieties in half the time. Landscape restoration adopting a holistic approach that spans the **entire agriculture value chain** has shown great impact in improving food security, incomes and **climate resilience** of farmers. Our partnerships with governments, the public and private sectors, NGOs, NARS and CGIAR partners have helped reap the impacts showcased in this report.

Dr Kiran K Sharma
Deputy Director General-Research, ICRISAT

WORK ACROSS THE SUSTAINABLE DEVELOPMENT GOALS*

In 2019, we worked with over **163 partners** from **27 countries** to contribute to **16 SDGs**

CROP IMPROVEMENT*

Variety releases

19 Varieties 6 Countries 6 Crops

- Tanzania 1
- Kenya 2 2
- Mozambique 3
- Zambia 1
- Ethiopia 3
- India 3 | 1 | 1 | 2

Varieties in National Performance Trials

336 germplasm/breeding lines/experimental hybrids

GENEBANK

2,840 accessions prepared in 2019 were deposited at **Svalbard Global Seed Vault** in early 2020

15,000 seed samples distributed in **15 countries**

SEED PRODUCTION*

Seed shared with farmer groups, NARS# and NGOs

64 tons breeder seed

8,729 tons certified seed

5,996 tons foundation seed

1,397 tons QDS/truthfully labelled

DIGITAL AGRICULTURE*

110,362,150 farmers reached through 22 digital initiatives

AGRI-FOOD SYSTEMS*

Soil management reach

Direct area ~**6,099,448 ha** (9 countries in Asia and Africa)

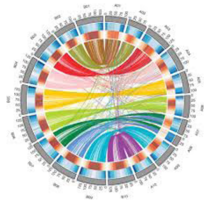
Watershed coverage (India, Ethiopia, Mali)

Direct area ~**117,955 ha**

Spillover ~**193,524 ha**

GENOME SEQUENCED

Decoded genome sequences for two subspecies of cultivated groundnut



National Agricultural Research Systems; * Figures sourced from MEASURE

Growing incomes, nutrition, resilience and gender equality

Livelihoods

Doubled yields, doubled incomes

- Pilot watershed projects in India and Ethiopia show how farmers' incomes can be doubled with landscape restoration and the use of improved varieties.
- High-yielding and machine-harvestable chickpea variety tested on Indian farms results in tripled yields and savings on labor costs.
- Improved groundnut varieties triple yields of seed producers in Africa.

Agronomy and market traits for released varieties

1. High grain yield
2. Early maturity
3. Abiotic stress tolerance
4. Biotic stress tolerance
5. Nutrition
6. Grain/pod size
7. Ethanol, biomass, others
8. Culinary
9. Fodder yield
10. Machine harvestability
(order based on weightage)

Nutrition

Biofortification and culinary traits

- High iron and zinc
- High iron and zinc
- Calcium, iron and zinc
- Protein
- Digestibility, protein
- High oleic, protein

Smart Food study shows significant increase in growth parameters (BMI and HAZ)* compared to control group in school children fed millet-based meals vs micronutrients fortified, rice-based meals.

* Body mass index (BMI); Height-for-age Z-scores (HAZ).

Environment & Climate

Digital technologies: Launched the world's first fully automated system for plot monitoring called agCelerant that provides climate solutions for Nigerian Agriculture.

The Meghdoot App, an ICT-enabled climate tool developed for the Indian government had >50,000 downloads.

Fewer hunger months: Reliance on food aid halves in a Ghanaian climate-smart village and Ethiopian watersheds.

Scaling up technologies: Watersheds in Africa and India have had requests for replication from governments.

Climate Research facility set up at ICRISAT headquarters.

Less land and water conflicts lead to improved prosperity in watershed projects in Ethiopia.

Gender

What women farmers want**

- Insights were generated on gendered seed knowledge, access and use in Uganda.
- GENDER Platform focuses on transforming food systems for gender equality in a climate crisis.
- Gender-responsive Plant Participatory Breeding Programs initiated in Africa.
- **South-South** collaborations in agribusiness: Participants from 22 African countries (50% women) trained to be entrepreneurs.
- Indigenous women farmers in India influence community diets and earn incomes.

** Contributions from the CRP Grain Legumes and Dryland Cereals led by ICRISAT

Sorghum | Finger millet | Pearl millet | Chickpea | Pigeonpea | Groundnut