



# Science and Innovation for Food Security and Peace

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# Drivers of Disruption



**Climate Change**

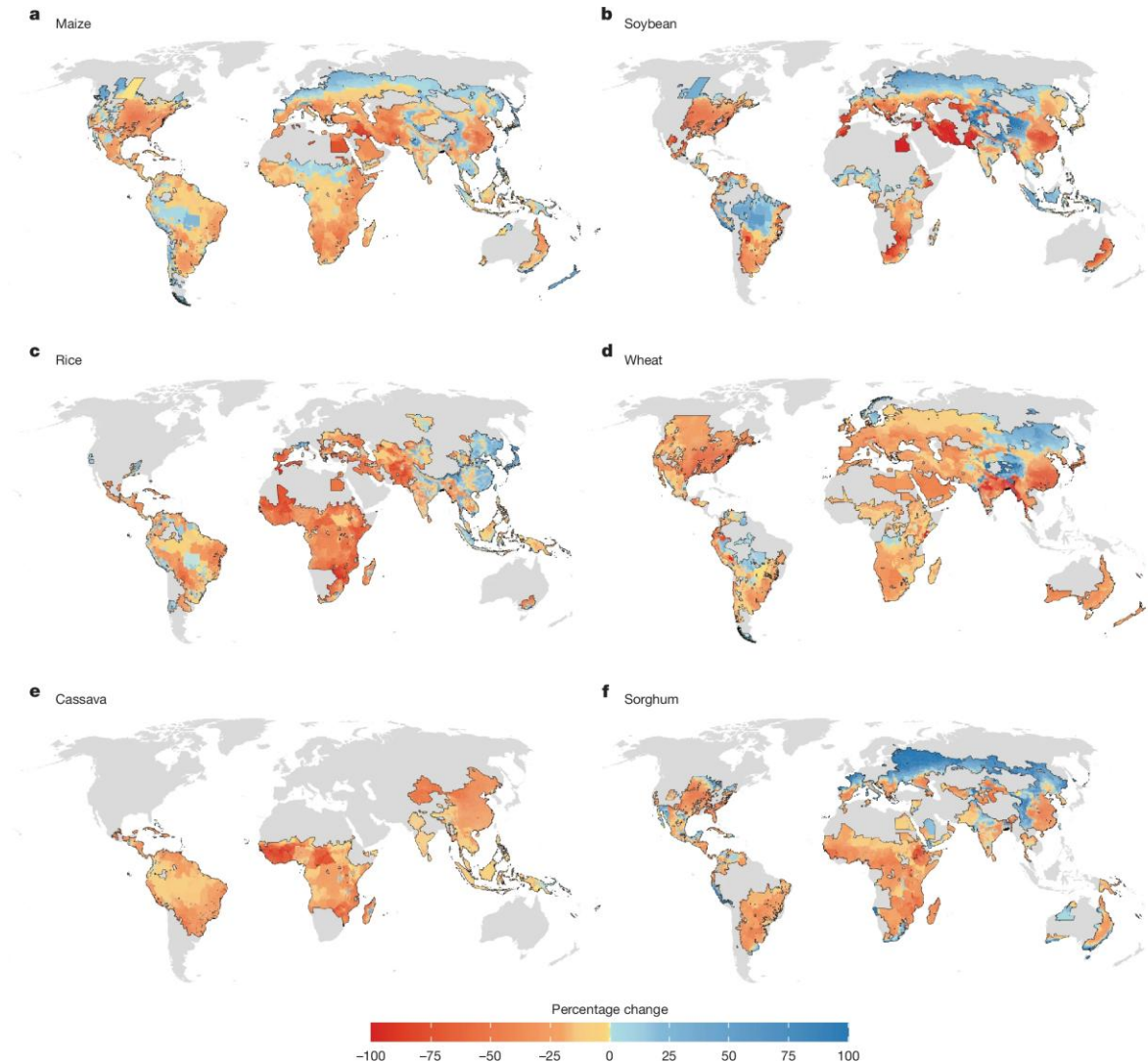


**Trade Disruptions**



**Geopolitics and  
Conflict**

# Impact of climate change on yields

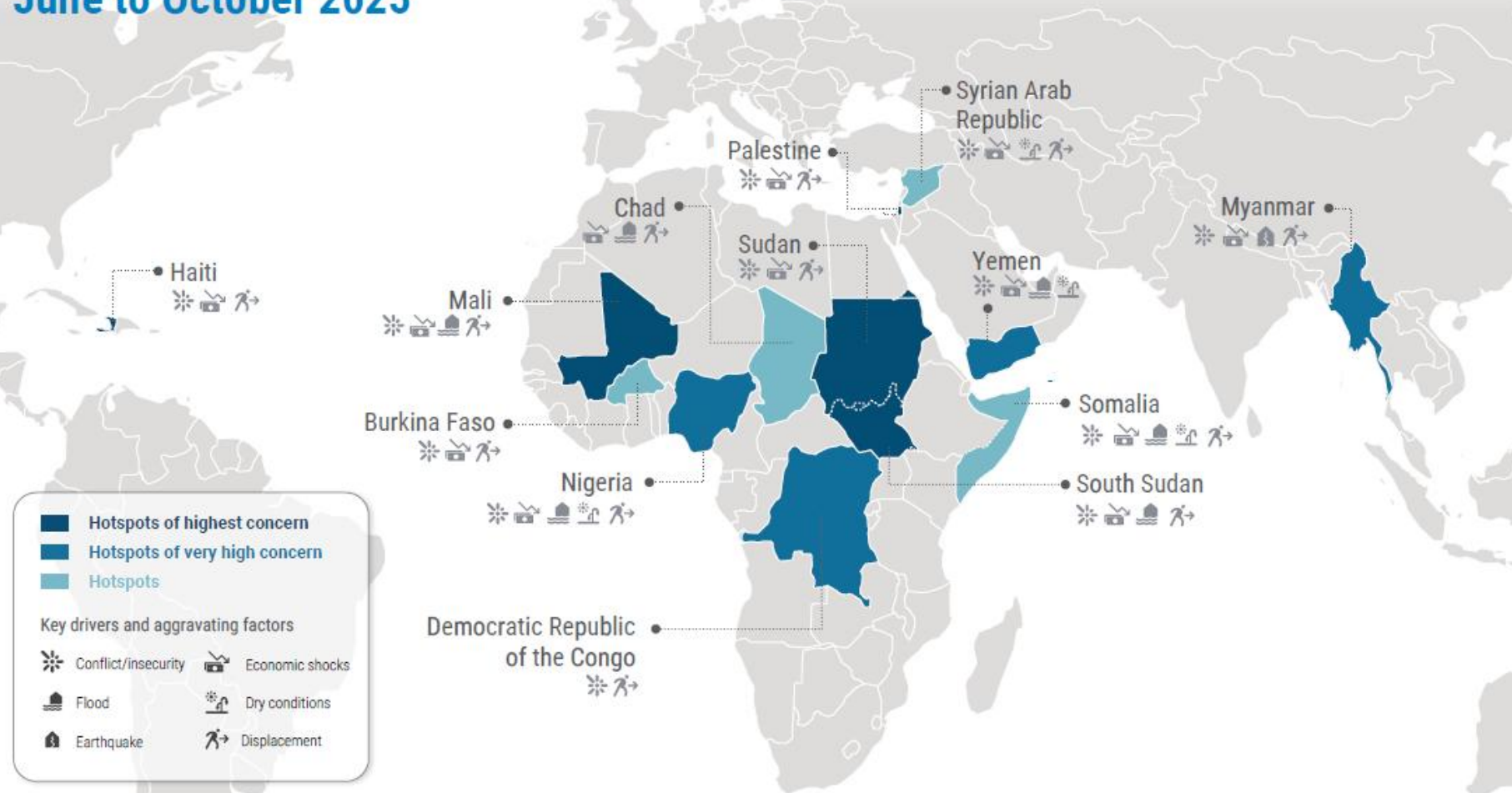


Projected end-of-century change in crop yields resulting from climate change, accounting for adaptation to climate and increasing incomes.

Hultgren et al., 2025

## Map of early warning hunger hotspots: June to October 2025

MORE INFORMATION



**FAO and WFP  
warn that acute  
food insecurity  
is likely to  
worsen across  
13 countries  
and territories  
identified as  
hotspots**

Source of data: WFP and FAO. 2025. *Hunger Hotspots analysis (June to October 2025)*. Rome.

Source of map: United Nations Geospatial. 2025. Map of the World. In: *United Nations*. [Cited 7 April 2025]. <https://www.un.org/geospatial/content/map-world-1>. Refer to the disclaimer on page ii for the names and boundaries used in this map. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Note: The displacement icon is used when displacement is a key driver of acute food insecurity, or when it is a significant factor contributing to vulnerability, even if not a direct driver. It applies to internally displaced persons as well as migrants and refugees.

Source:  
WFP and FAO. 2025. *Hunger Hotspots. FAO-WFP early warnings on acute food insecurity: June to October 2025 outlook*. Rome.

<https://doi.org/10.4060/cd5684en>

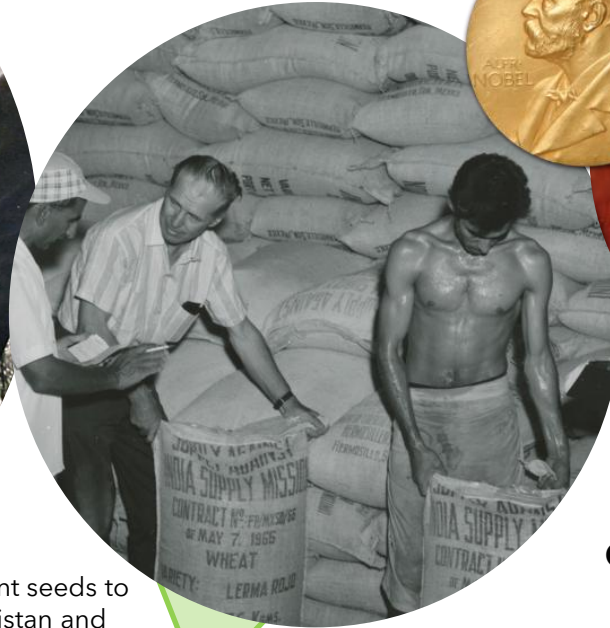
# CIMMYT's History



Norman Borlaug with  
Vice President  
Henry Wallace (1944)

**Dwarf wheat potential**

1944



CIMMYT sent seeds to  
India, Pakistan and  
Bangladesh

**Green Revolution**

1960's



**"You can't build  
peace  
on empty stomachs"**

**Nobel Peace Prize**

1970



**Focus on research  
projects to strengthen  
global food security**

**Current global impact**

CIMMYT generates  
benefits of  
**US \$3.5-\$4 billion  
annually worldwide  
for the  
agricultural sector.**



CIMMYT scientists win  
the World Food Prize

2000's

**NOW**

# Working for a world with resilient agri-food systems and protecting biodiversity



**70% of wheat and more than 50% of maize** varieties sown worldwide are derived from CIMMYT materials

Benefit-cost ratio for **wheat** research ranges from **73:1 to 103:1** & for **maize** research from **22:1 to 35:1**

**Operations in more than 80 countries.**  
Improving people's livelihoods

# CIMMYT's global footprint

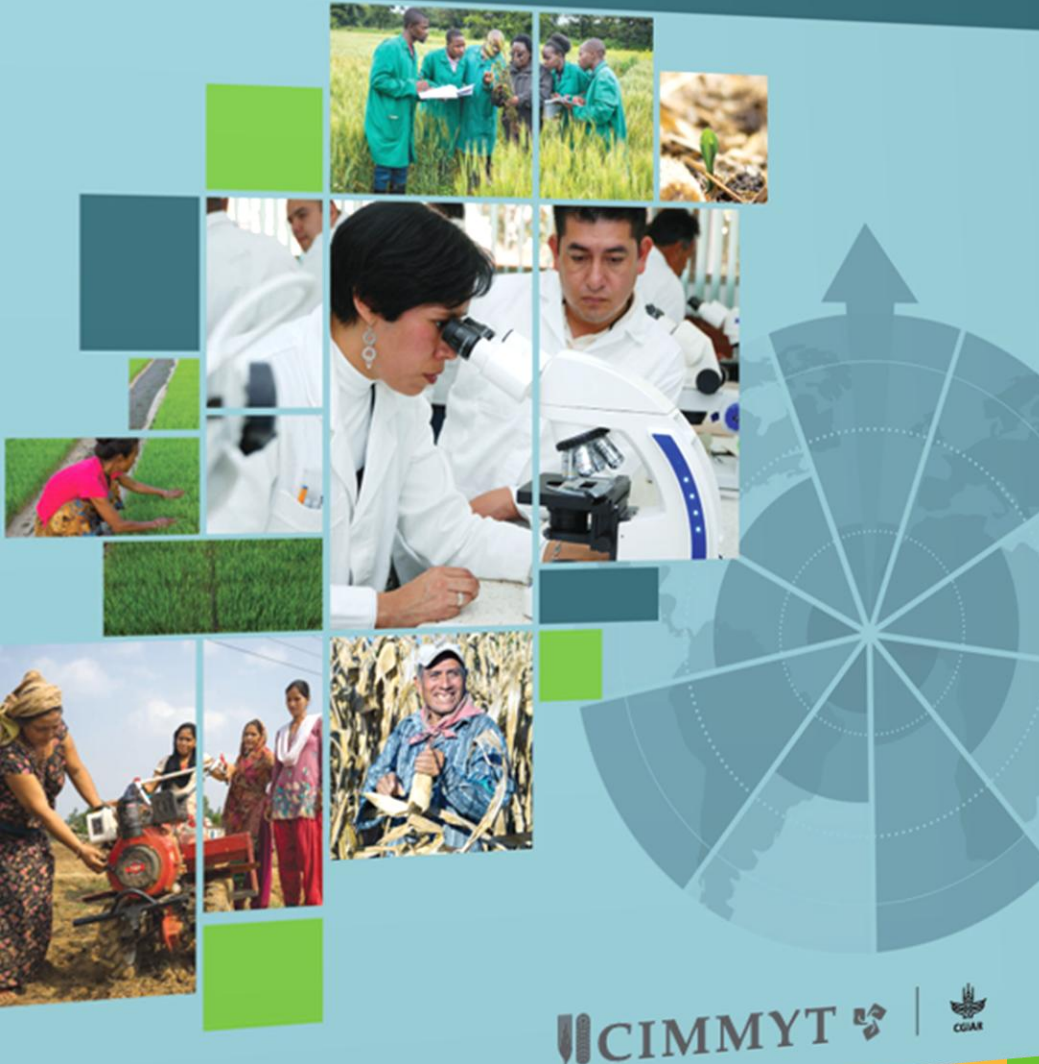


Afghanistan	Botswana	Congo	France	Japan	Mauritius	Panama	Sudan	Uganda
Algeria	Brazil	Costa Rica	Germany	Kazakhstan	Mexico	Peru	Suriname	United Kingdom
Angola	Burkina Faso	Cote d'Ivoire	Ghana	Kenya	Morocco	Philippines	Sweden	Uruguay
Australia	Burundi	Cuba	Guatemala	Laos	Mozambique	Rwanda	Switzerland	Uzbekistan
Argentina	Cambodia	DRC	Honduras	Lesotho	Myanmar	Senegal	Syria	Venezuela
Austria	Cameroon	Ecuador	Indonesia	Madagascar	Namibia	Singapore	Tanzania	Vietnam
Bangladesh	Canada	Egypt	Iran**	Malawi	Nicaragua	Spain	Trinidad & Tobago	Zambia
Benin	Chile	El Salvador	Ireland	Malaysia	Nigeria	South Africa	Turkey	Zimbabwe
Bhutan	China	Eswatini	Israel	Maldives	Pakistan	South Sudan	UAE	
Bolivia	Colombia	Ethiopia		Mali		Sri Lanka	USA	

# Our mission

**Science and innovation  
for a food and nutrition  
secure world.**

# Science and Innovation for a Food and Nutrition Secure World CIMMYT's 2030 Strategy



- CIMMYT's 2030 Strategy **supports the One CGIAR strategy**
- It comes from an **inclusive and participatory process**
- A vision for **transforming agriculture & improving lives**

# Our evolving core business

## Accelerating food systems transformation:

- Collective action for science and innovation
- Foster productive, inclusive and resilient agrifood systems
- To advance global food and nutrition security within planetary boundaries



# Strategic and organizational effectiveness



# Safeguarding, characterizing and using biodiversity



close to **124,000** unique seed collections of wheat and relatives of wheat



over **28,500** unique seed collections of maize and relatives of maize



# Multi-crop, multi-institutional and multi-disciplinary



Cassava and  
cowpea breeding  
and genetics



Cassava and  
bean pre-  
breeding



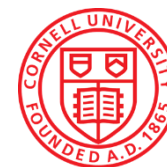
Rice pre-  
breeding and  
trait pipeline  
models  
Maize pre  
breeding,  
EnvGWAS &  
predictions,  
genetic foresight



Sorghum  
genomics

UNIVERSITY  
OF  
CALIFORNIA

Population and  
evolutionary  
genetics



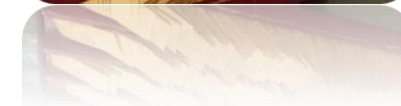
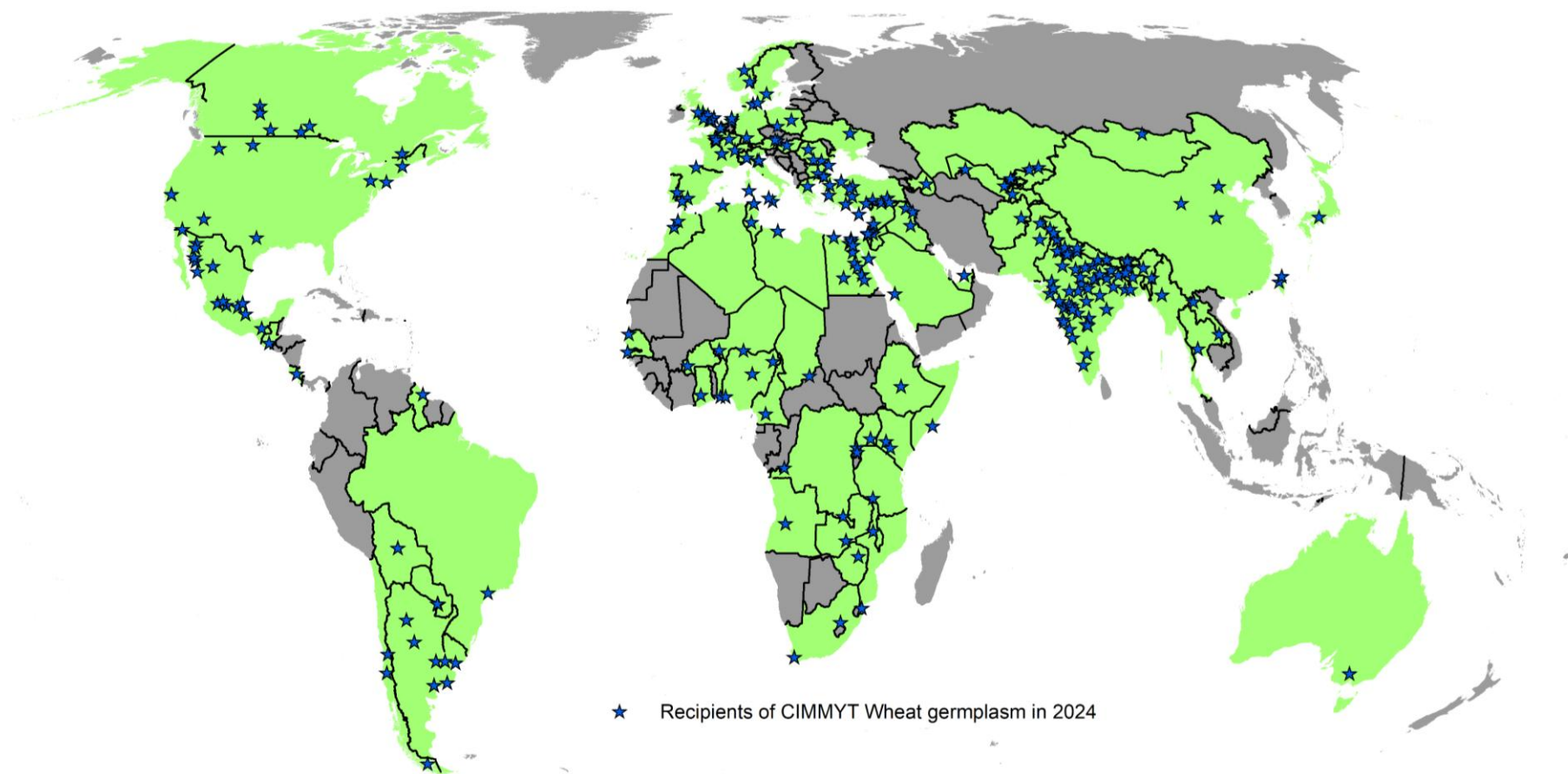
Genomics and  
genomic  
imputation

Genomics, quantitative genetics, gene-sequencing, population genetics, biometrics, bioinformatics, programming, GIS, genebank curation, physiology, project management, phenotyping, breeding, artificial intelligence, satellite imagery ....

**A state-of-the-art  
maize doubled  
haploid (DH)  
facility, first of its  
kind in Asia, is  
established in  
Kunigal, Karnataka**



# CIMMYT Wheat germplasm distribution in 2024



# CIMMYT and partners are working on **7 crops**, which are already being commercialized & are creating new opportunities in consumer demand in Africa



**Bambara Groundnut**



**Finger millet**



**Sesame**



**Pigeon Pea**



**Okra**



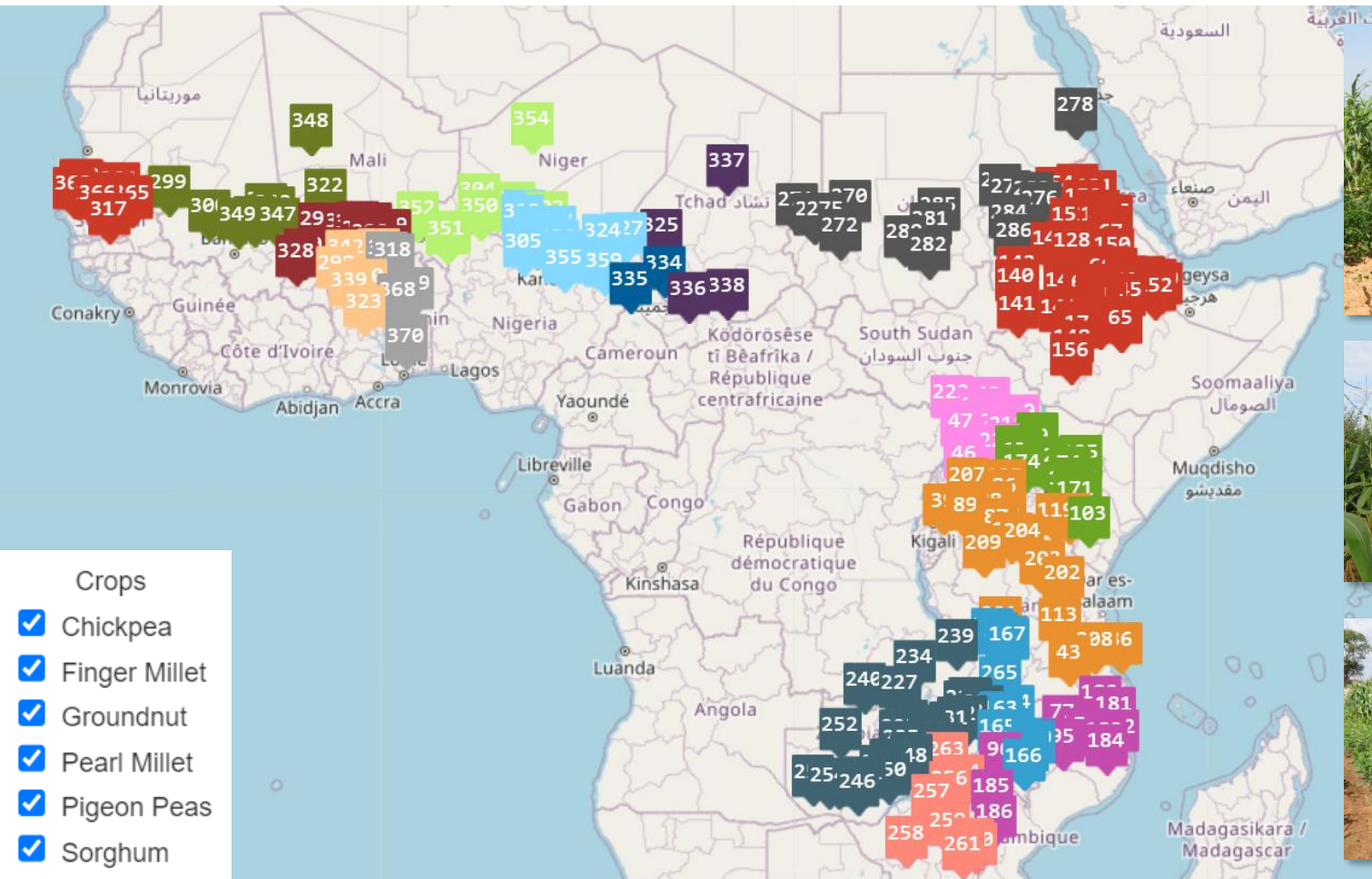
**Amaranth**



**Taro**

*Photos: CropTrust, CGIAR Genebank*

# Regional Trialing network for dryland crops



Pearl millet /  
cowpea  
Farmer's field  
near Kano, Nigeria  
Sept 2023



Pigeon pea / maize  
Farmer's field  
near Kiboko, Kenya  
June 2024



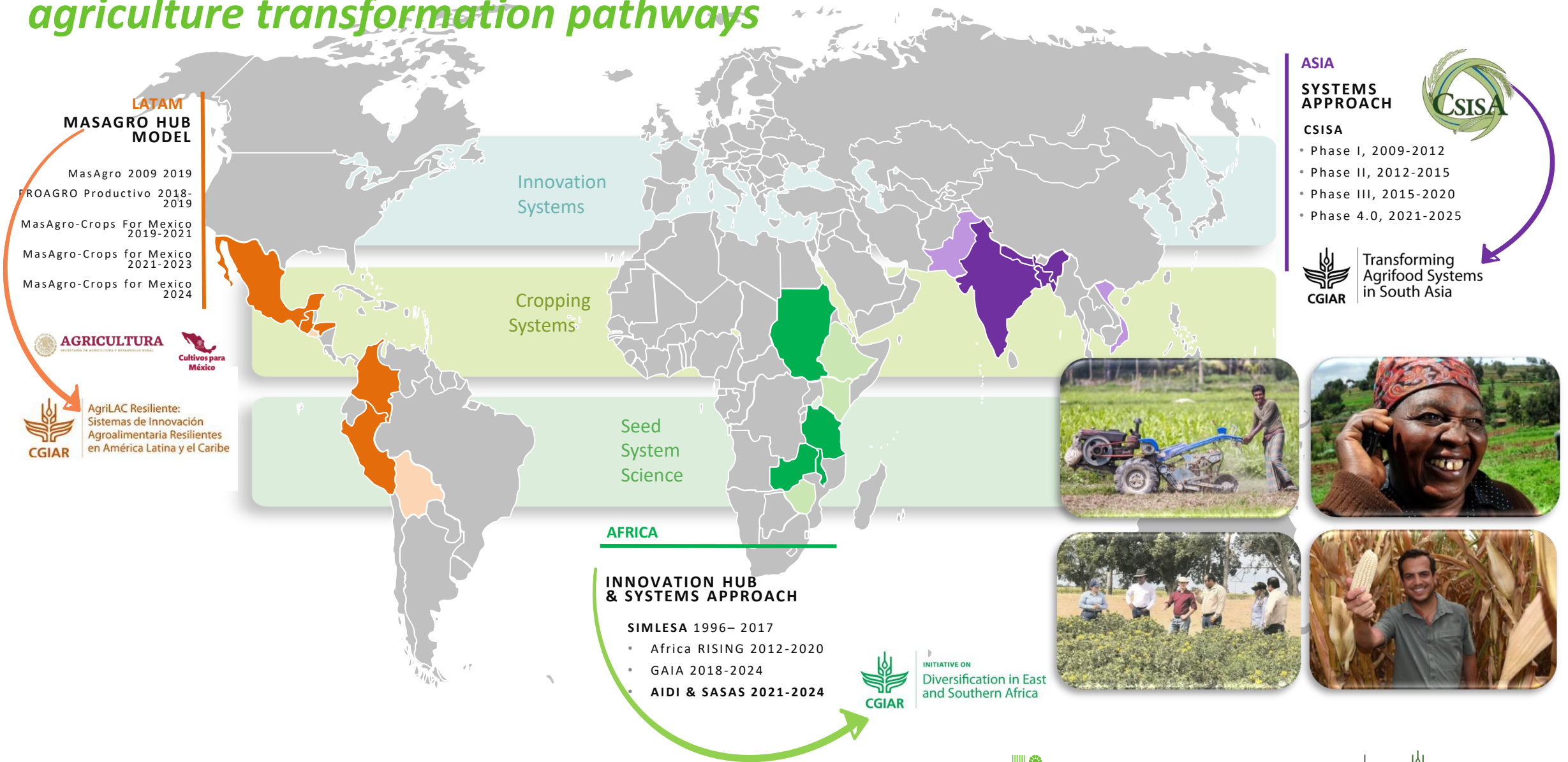
**A New Paradigm**  
Breeding  
(pigeon pea)  
for performance  
in intercrop  
CIMMYT,  
Kiboko, Kenya 2024

# Regenerative Agriculture

CIMMYT's work resulted in 1 billion liters of fungicide application avoided since 2000 alone.



# Sustainable Agrifood Systems at CIMMYT: *regenerative agriculture transformation pathways*





# India is benefiting from CIMMYT's global impact

- CIMMYT contributes to **50% of the improved wheat** cultivated in India.
- In **2023**, the harvest of wheat surpassed **110 million tons for the first time**.
- **Six of the top 10 bread wheat varieties in India** by current coverage of area **are derived from the ICAR-CIMMYT-BISA collaboration**.

# The beginning



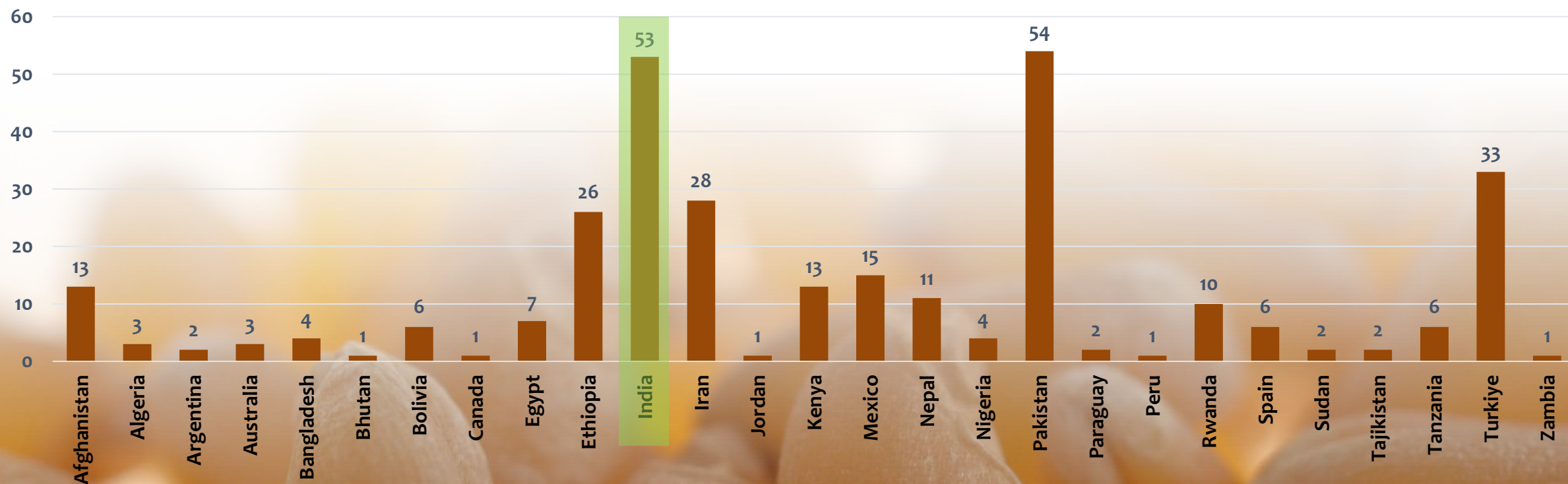
The collaboration started with Nobel laureate **Dr. Norman E. Borlaug** **visiting India in 1963** to usher in the Green Revolution in active partnership with the Government of India.



- CIMMYT currently working in **Delhi, Punjab, Haryana, Bihar, Madhya Pradesh, Uttar Pradesh, Maharashtra, Odisha, Karnataka, and Telangana.**
- In 2011, the Indian Council of Agricultural Research (ICAR) and CIMMYT launched the **Borlaug Institute for South Asia (BISA).**



**Between 2015 & 2023,  
more than 308 CIMMYT-derived spring bread varieties  
were released by NARS (national partners & authorities)  
in 27+ countries**



# Our accomplishments alongside Indian farmers and institutions

Capacity building for **30,000 stakeholders**, including **2,000 agricultural scientists**.

**CIMMYT, ICAR, CCAFS and BISA** introduced the concept of climate smart agriculture in **2,000 villages** of Bihar, Madhya Pradesh, Punjab, Maharashtra and Haryana.

Sole source of **quality protein maize (QPM)** germplasm.

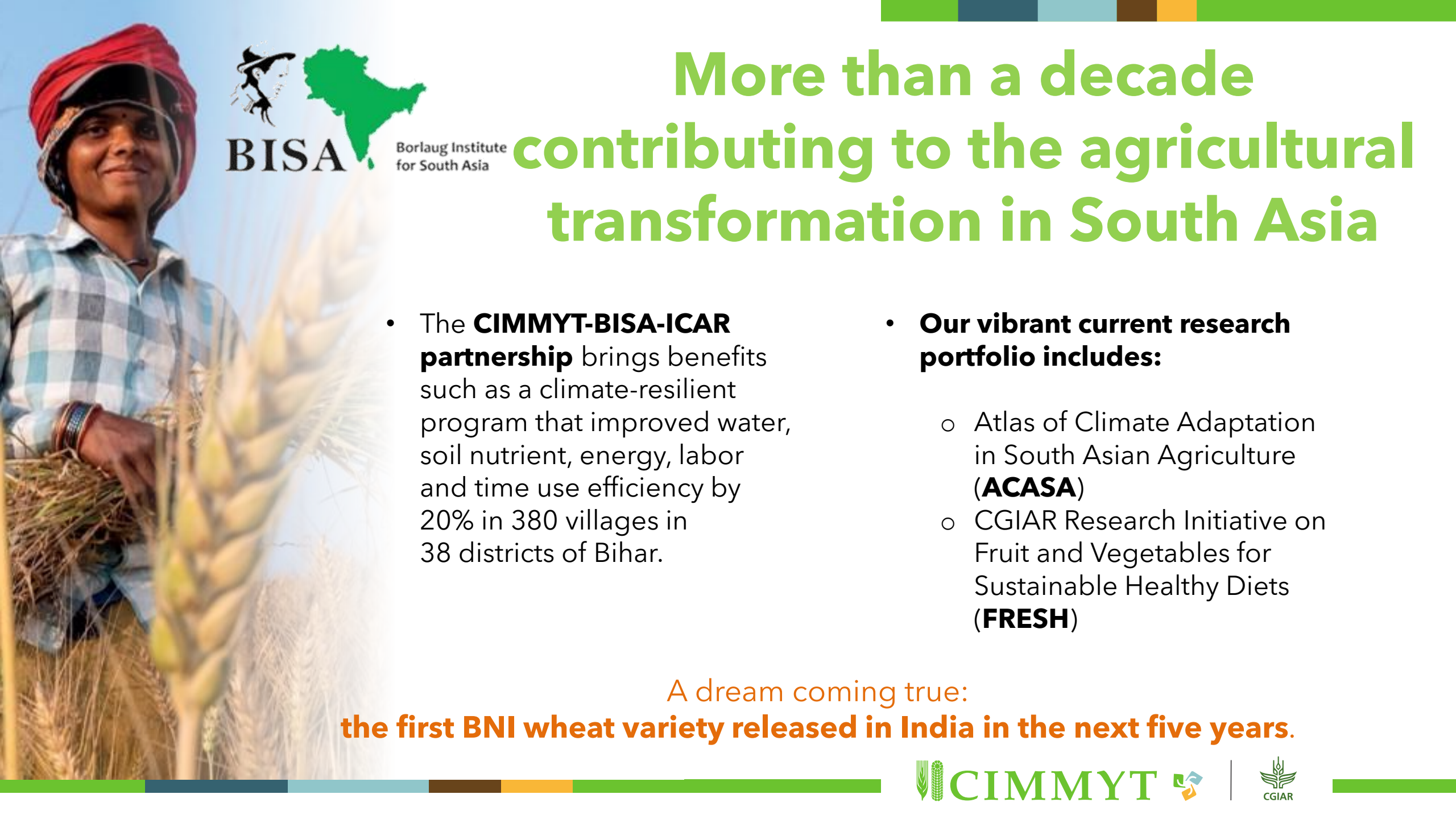
**26 open pollinated** maize varieties and **11 high-yielding** stress-resilient maize hybrids released.

In the past 60 years, **275 wheat varieties** have been developed

In the last decade, India released 85 wheat varieties, with **34 from the CIMMYT-ICAR-BISA collaboration**.

Since 2017, **24 biofortified high zinc wheat varieties** released in India, Nepal, Bangladesh, and Pakistan.





# More than a decade contributing to the agricultural transformation in South Asia

- The **CIMMYT-BISA-ICAR partnership** brings benefits such as a climate-resilient program that improved water, soil nutrient, energy, labor and time use efficiency by 20% in 380 villages in 38 districts of Bihar.
- **Our vibrant current research portfolio includes:**
  - Atlas of Climate Adaptation in South Asian Agriculture (**ACASA**)
  - CGIAR Research Initiative on Fruit and Vegetables for Sustainable Healthy Diets (**FRESH**)

A dream coming true:  
**the first BNI wheat variety released in India in the next five years.**

# More than a decade contributing to the agricultural transformation in South Asia

**200,000**  
stakeholders' capacity  
strengthened in  
different technologies

**15,000**  
wheat genotypes  
evaluated using  
precision phenotyping  
and genomics

**10,000 kg**  
ha<sup>-1</sup> productivity  
achieved first time in  
Indian wheat trials

**5,000 tons**  
of quality seed  
produced and  
distributed to  
stakeholders

**3,000**  
villages in India and  
Nepal transformed  
following the CSV  
approach

**30**  
national and  
international donors  
supported BISA  
programs

**400 ha**  
of state-of-art farms  
established

**200**  
international  
stakeholders trained in  
advanced research

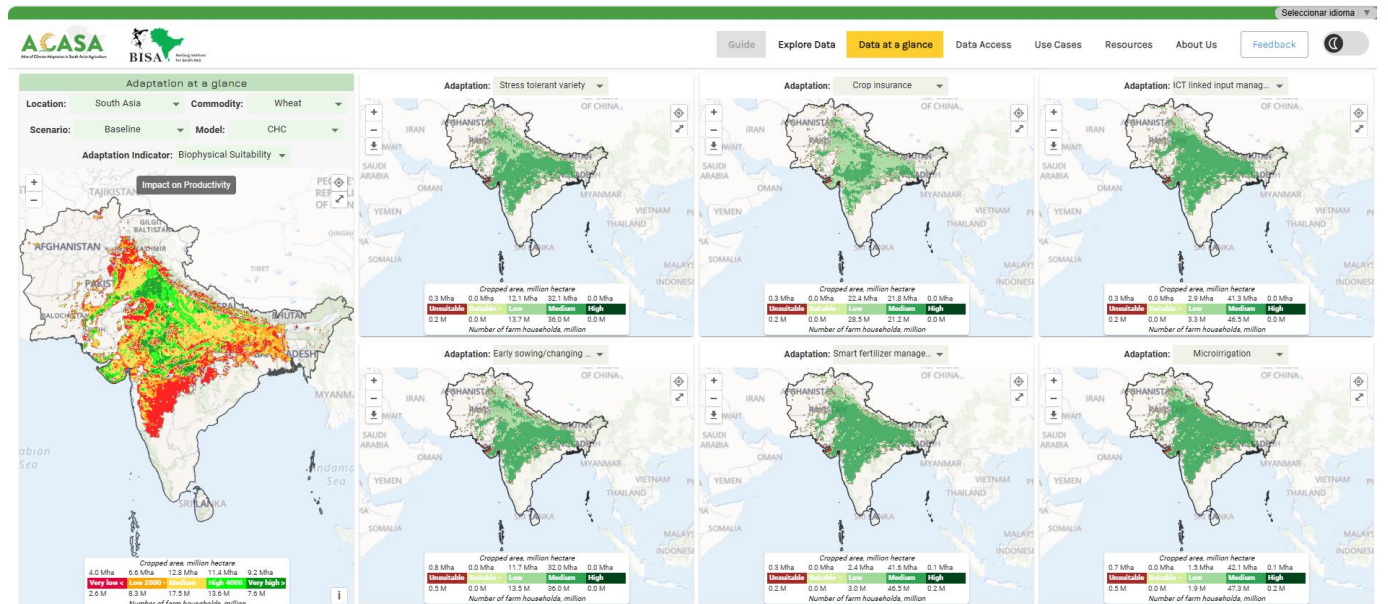
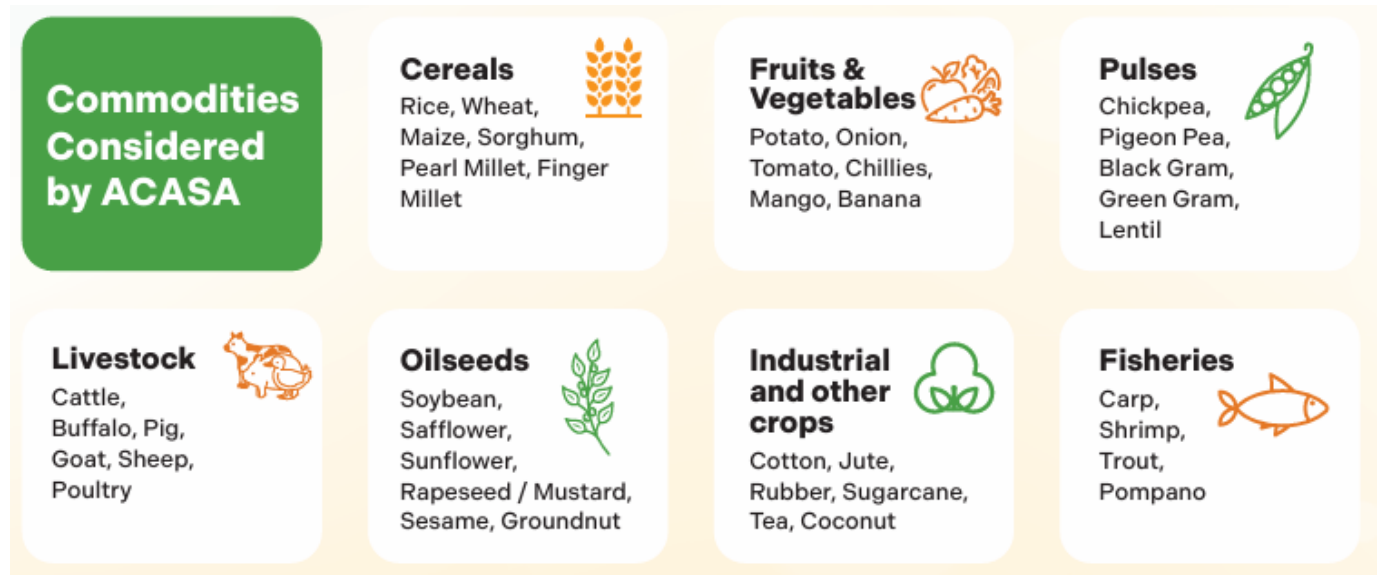
**200**  
research papers  
published in  
international journals

**170 millions**  
subsidy by the GOI for  
Happy Seeder and SMS

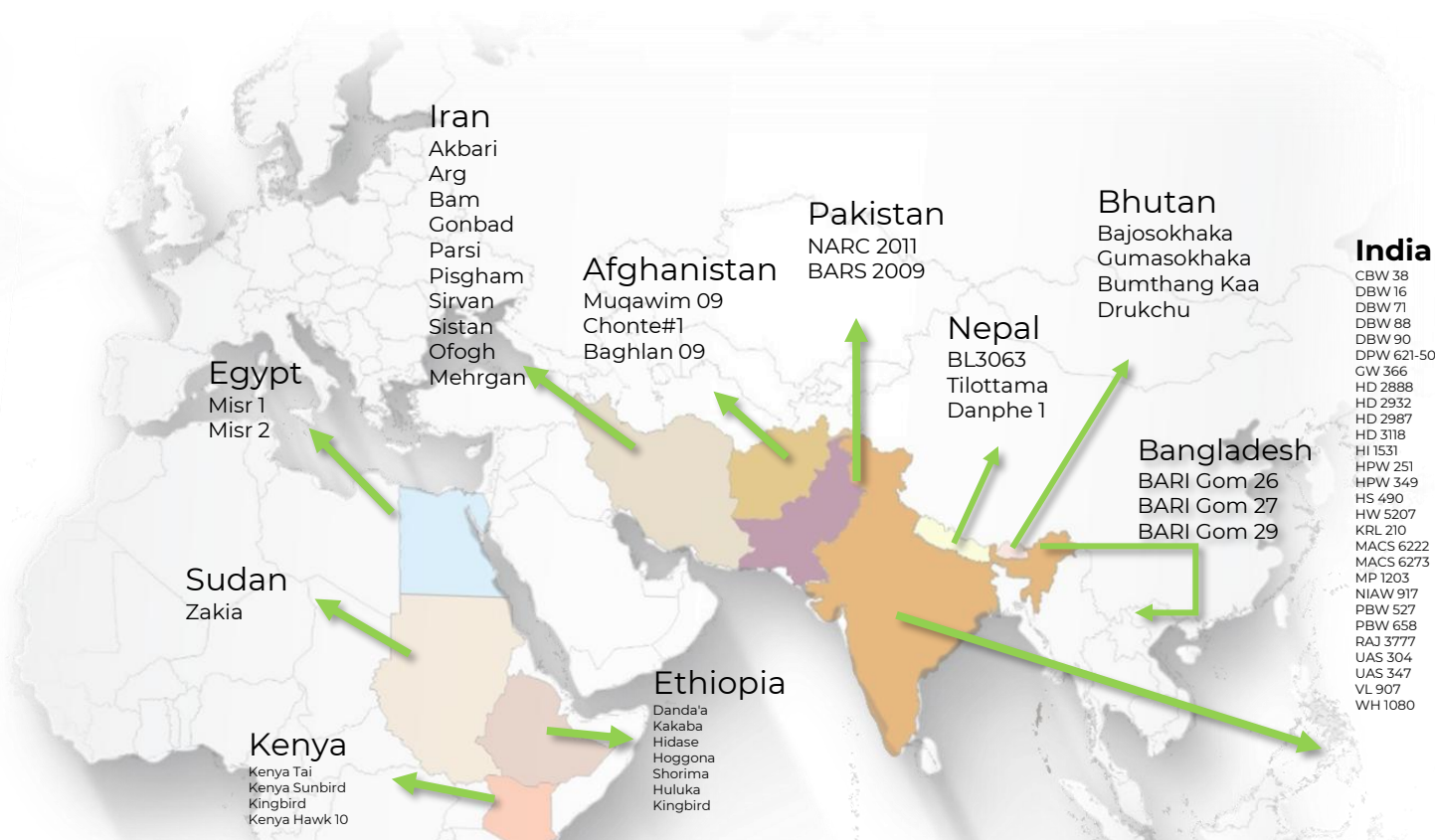


Its mission is simple but meaningful:

Improve the resilience and livelihoods of smallholder farmers through better planning, targeted interventions, and inclusive policy design.



# Regional collaboration on wheat blast



- Based on the **Ug99 model** that led to a timely release of resistant varieties.
- Bangladesh: a **platform for wheat blast established at Jashore** serving other countries.
- **>15,000 lines** tested in the last 4 years.
- **Resistant varieties released** in countries like India, Nepal, and Bangladesh.
- It's a **training and capacity building hub** on wheat blast.
- **100 participants from 10 countries** trained since 2017.

# Zinc biofortified wheat in South Asia

**India - more than 15 biofortified varieties** released with 30-40% higher Zn & sown on >3 million hectares during the 2023-24 season



**Pakistan - Akbar 2019 (Zn biofortified)** released in 2019 with 30% more Zn & grown on over 42% area during the 2023-24 season



**Nepal - Five Zn biofortified varieties** released in 2020 & grown under about 25% area during the 2023-24 season



Mainstreaming Zn in CIMMYT wheat is underway to increase frequency of high Zn competitive wheat lines delivered to partners

# Excellence in science in India and beyond



**Dr. Velu Govindan**  
presented  
**the 2025 Derek Tribe  
Award.**



**Dr. M. B. Prasanna**  
earned  
**the 2024 Dr. M.S. Swaminathan  
Award for Leadership in  
Agriculture**

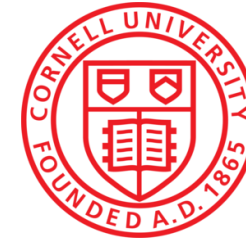


**Dr. Arun K Joshi**  
received  
**the 2023 Sh. VS Mathur  
Memorial Award**



**Dr. Ravi Singh**  
awarded  
**the Padma Shri** from the Indian  
Government, one of the highest  
honors in the country.

# Thanks!



ROTHAMSTED  
RESEARCH



INTERNATIONAL  
POTATO CENTER

ILRI  
INTERNATIONAL  
LIVESTOCK RESEARCH  
INSTITUTE





Thank you  
for your  
interest!

