Investing in a **Food, Nutrition & Climate Secure Future**

The Case for Investment, CGIAR 2023
$4bn for the 2025-2027 Research Portfolio

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Food security and climate change – two of humanity's most urgent challenges – are inextricably linked. Our agriculture and food systems – the way we produce, transport, process, trade, store and consume food – must be part of the solution to climate change.

Extreme weather, in combination with conflicts, economic crises and pandemic recovery, is disrupting lives and fueling food and nutrition insecurity, poverty and inequality.

Hunger and malnutrition are at record highs, reversing recent gains. Around **800 million** people faced hunger in 2021. Nearly **350 million** people are affected by extreme hunger. Consumers around the world are struggling with erratic food supplies and prices.

Many of the **500 million smallholder farmers**, who provide a third of the world's food on **83 percent** of the world's farms, live in regions especially affected by climate change, putting their lives and livelihoods at risk. In a world that is 2°C warmer, an additional **189 million people** will face hunger. In a 4°C warmer world, an additional **1.8 billion** people will go hungry.

"Now more than ever we need your efforts to support demand-driven innovations such as those championed by CGIAR."

Ban Ki-moon,
8th UN General Secretary and Co-Chair of the Ban Ki-moon Centre for Global Citizens

The world simply cannot meet its climate or development goals without transforming food systems.

With science, we can equip smallholder farmers around the world with the know-how and innovations they need to produce more and better food with fewer resources, adapt to changing and challenging environments and, at the same time, protect natural resources and biodiversity.

With research and innovation, we can transform food systems from being a source of emissions to a sink for carbon, from fueling environmental degradation to supporting regeneration, and from displacing biodiversity to protecting it.

Agriculture is also a powerful lever for development outcomes. Lifting sustainable agricultural productivity is the single most effective way to reduce poverty and inequality and raise incomes, directly supporting the Sustainable Development Goals (SDGs).

CGIAR is the world's largest publicly-funded agricultural research network, with 10,000 staff working in over 80 countries; translating global science to local solutions. For over 50 years, CGIAR has been at the forefront of agricultural research and innovation.

Our impact speaks for itself. CGIAR is best known for preventing a food crisis across Asia by developing the high-yielding rice variety that drove vital increases in food production in the second half of the 20th Century. The work led by Nobel Laureate, Dr Norman Borlaug, and Professor M.S. Swaminathan is credited with averting a global famine, saving a billion lives.

The challenges the world faces today – from climate change to pandemics and conflict – are increasingly complex and interconnected. No single discipline offers the systems solutions we need. That's why our research focuses on human and societal conditions, and the natural world, creating a complete picture of challenges and opportunities as we look to the future of food, land and water systems.

Today, our scientists and partners are united in a common mission to transform food, land and water systems to shape a food, nutrition and climate secure future for all. We put technology into the hands of farmers across the developing world. And we provide the research and innovations that helps policymakers and science and business networks shape a better future for people and our planet.

With investment, food systems can solve the climate crisis

Our future is at a crossroads. With the right investment, agriculture has the potential to be humanity's biggest solution to climate change.

Food systems with investment

- Reduce poverty and inequality and raise incomes
- Protect rather than reduce biodiversity
- Support regeneration instead of fuelling environmental degradation
- Become a sink for carbon rather than a source of it

Food systems without investment

- Today **350m** people are affected by extreme hunger
- With a **2+** degree temperature increase **539m** will face extreme hunger
- With a **4+** degree temperature increase **2.1bn** will face extreme hunger

CGIAR evaluates impact systematically. We have robust evidence that for every $1 invested in agricultural research and development, investors see $10 worth of benefits to smallholder farmers, vulnerable communities and ecosystems. The adoption of CGIAR crop technologies in developing countries is estimated to have resulted in cumulative economic benefits of $1,375-$1,477 billion between 1960 and 2020.

The world is underinvesting in the solutions we need to meet the SDGs and climate targets

- **Not nearly enough overseas development assistance – just 7.4 percent in 2021 – is spent on research and innovation that tackle the root causes of hunger and malnutrition. The Ceres 2030 report identifies the need to double investment in agricultural R&D to help end hunger, double smallholder farmer incomes and protect the climate.**
- **More government spending ($108 billion globally) went to R&D for the energy sector in 2017-2022, reducing emissions by 13 gigatons of carbon dioxide equivalent per year. A significantly lower investment of $70 billion in R&D in the agriculture sector would reduce emissions by 15 gigatons a year.**
- **Not nearly enough investment – just 1.7 percent in 2018 – reaches the smallholder farmers who are vulnerable to challenges of climate change, despite their critical contribution to global food security and local economic stability.**

Climate-smart crops harness natural diversity

An investment in CGIAR will unlock the full potential of the 713,000 crop, forage and tree collections in CGIAR genebanks to increase heat and drought tolerance, yield, disease resistance, and climate-proof breeding pipelines. It would support the 11 genebanks we hold as international public goods, securing the crop diversity we need to feed and nourish the world and protect it from climate change.

Thanks to genebanks, CGIAR scientists have identified the gene in wild potatoes that can help breed modern varieties to withstand late blight, the world's most damaging disease for potato crops; bred faster-growing, early-maturing crops that extend growing seasons developed drought-resistant maize and wheat, saline-tolerant rice that withstands more extreme and frequent floods and rice that can be sown directly in the ground, reducing the amount of water needed for production.

CGIAR science and innovation that deliver against global targets

- Improved seeds and breeding varieties to cope with climate change
- New technologies, techniques and tools
- Integrated and better targeted interventions, including for disadvantaged groups
- Managed genebanks, to maintain genetic diversity to cope with future climates
- Evidence generation and policy advocacy

- Improved seeds and breeding varieties to reduce land use and GHG emissions
- New technologies, techniques and tools
- Integrated and better targeted interventions, including for disadvantaged groups
- Evidence generation and policy advocacy

- Working with national governments and agricultural research services to craft relevant policies/strategies
- Supporting governments and investors to measure mitigation policies and activities
- Helping governments unlock innovative finance
- Evidence generation/ advocacy to support national focus on agriculture and food systems

- Consumptive water use in food production of less than 2500 km3 per year (with a focus on the most stressed basins)
- Zero net deforestation
- Nitrogen application of 90 Tg per year (with redistribution towards low-input farming systems) and increased use efficiency
- Phosphorus application of 10 Tg per year

← Evidence and knowledge sharing →

Investments of $4bn over 2025-2027 are urgently needed to harness the power of science and innovation to tackle climate change, increase productivity and help put food systems back on track to meet the SDGs and climate targets.

"CGIAR has the people, the presence and the track record of delivering game-changing innovations needed to tackle the greatest challenges of our time. We must transform food, land and water systems to support food, nutrition and climate security for all. With science we can."

Dr. Ismahane Elouafi, CGIAR Executive Managing Director

With science we can

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