Agenda Item 4
For Approval
Issued: 29 May 2024

CGIAR 2025-30 Portfolio Narrative

Purpose

This document sets out the CGIAR 2025-30 Portfolio Narrative, which provides a high-level overview of the proposed Portfolio along with brief descriptions of its nine 'Programs', three 'Accelerators', as well as CGIAR's work on Genebanks.

Endorsement of the System Board

At its 29th meeting on 11-12 May 2024, the System Board reviewed the draft CGIAR 2025-30 Portfolio Narrative. At the conclusion of its deliberations, pursuant to the System Board's role set out in Article 8 kk) of the Charter of the CGIAR System Organization[1], the System Board endorsed the document.

Action Requested

The System Council is requested to:

- Review the CGIAR 2025-30 Portfolio Narrative alongside advice from the Independent Science for Development Council (document SC20-04b); and if thought appropriate;
- Approve the CGIAR 2025-30 Portfolio Narrative as the set of strategic priorities for CGIAR Research and Innovation, pursuant to Article 6.1 a) iii. of the CGIAR System Framework; and
- Provide guidance to inform the next phase of design of the Portfolio.

Subject to the System Council's approval to proceed, and taking into account the ISDC's recommendations, as well as guidance from the System Board and System Council, full Program and Accelerator design documents, and an updated Portfolio-level narrative will be developed in line with the timeline set out in Section 6 of this document.

Document category: Working document of the System Council.
There is no restriction on the circulation of this document

Presented by: Ismahane Elouafi, CGIAR Executive Managing Director

[1] The Charter at Article 8.1 kk) provides that the System Board shall "provide recommendations to the System Council on strategic action to ensure results and continued relevancy of agricultural research for development".

CGIAR Portfolio Narrative
2025–2030

29 May 2024

With science we can

CGIAR

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The work of the Alliance's Crops for Nutrition and Health research area.
Credit: Neil Palmer / CIAT

PREAMBLE: TRANSFORMING FOOD, LAND, AND WATER SYSTEMS TO 2050

As reflected in an array of target-setting exercises, such as the Sustainable Development Goals (SDGs), Nationally Determined Contributions under the Paris Agreement, and the Kunming-Montreal Global Biodiversity Framework, the world aims for multiple, major transformations by 2050 or sooner, including:

- greatly improved living standards and resilience of livelihoods;
- greatly improved nutrition, diets, and health;
- food systems as engines of inclusion;
- net zero greenhouse gas (GHG) emissions (potentially implying net negative agriculture, forestry, and other land use emissions); and
- halting human-induced loss of known threatened species and greatly improving general environmental conditions.

Food, land, and water systems lie at the heart of the world's ability to simultaneously achieve these aspirations in the context of a rapidly warming planet. The 2025—30 research and innovation Portfolio outlined in this document describes CGIAR's planned contributions to meeting these 'great expectations'. In contemplating this daunting task, it is helpful to look back at the past 30 years.

Looking back: 1990 to 2020

In 1990, almost 40% of the world's population was characterized as absolutely poor. Among the multiple factors that have enabled a dramatic reduction of poverty from 1990 to present (to about 8%), the production, processing, and distribution of significantly greater volumes of food has been essential (Table A). At the global level, production increased by around two thirds between 1990 and 2020, with consumption growing substantially in all regions of the world.

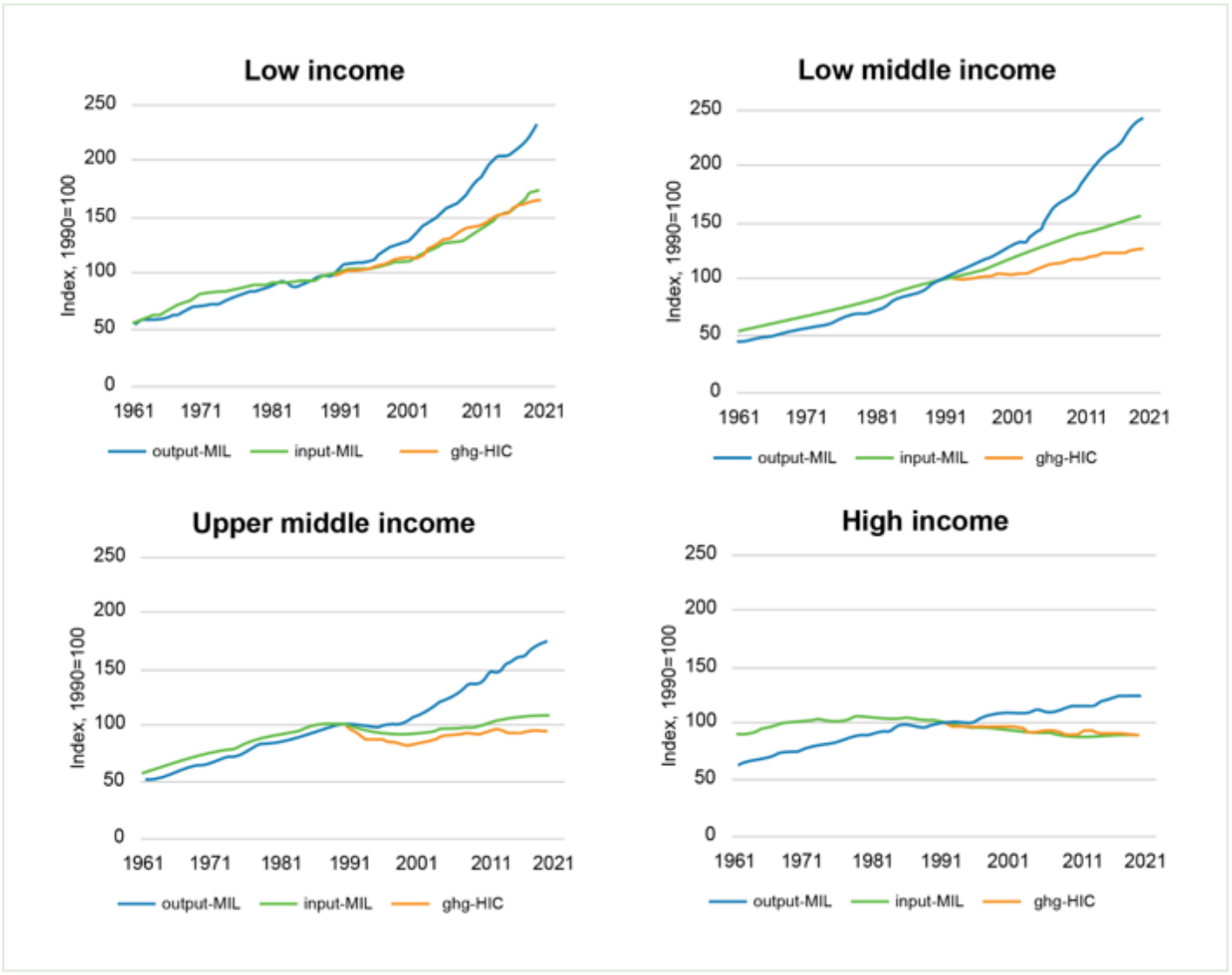
Table A. Growth rates (%) in food consumption and demand as proxied by dietary energy

	IFPRI IMPACT Model		USDA/ERS FARMS Model	
Region	**1990-2020**	**2020-2050**	**1990-2020**	**2020-2050**
China	48.8	2.7		-2.8
East and Southeast Asia excluding China	39.3	25.7		11.3
Latin America and Caribbean	53.1	23.9		23.0
Middle East and North Africa	72.4	46.8		38.0
OECD (1990)	50.5	15.0		8.0
South Asia	80.2	48.5		34.7
Sub-Saharan Africa	137.6	90.1		105.1
World	70.7	31.7	62.0	26.6

Sources: IFPRI calculations 2023; USDA estimates from Sands et al 2023

These large increases in global food production can be attributed to two sources: (1) greater use of aggregate inputs (land, labor, intermediate inputs, machines, etc.) and (2) process improvements (producing more with the same volume of aggregate inputs), also called total factor productivity (TFP) (Figure A). The relative importance of these two factors depends on countries' income levels. In low-income countries, about two thirds of production growth is attributable to growth in the use of aggregate inputs, while about one third of production growth is attributable to TFP. In lower middle-income countries, these proportions are reversed. In upper middle-income countries, nearly all production growth is attributable to TFP. In high-income countries, TFP growth outweighed the decline in aggregate input use.

Figure A. Aggregate outputs, inputs, and GHG emissions by country income level



Note: TFP equals the difference between growth in aggregate output and growth in aggregate input.
Source: USDA TFP database

Overall, TFP has been important in all contexts. In most instances, more than one third of TFP growth results from research and development (R&D). The role of public research stands out, particularly in lower-income contexts. As highlighted by several rigorous independent studies, CGIAR – with a budget roughly comparable to that of a single research university in a high-income country – has significantly contributed to the systemic improvements that underlie the reductions in global poverty from 1990 to 2020 through its research on genetics, agronomy, policies, and institutions, among others.

Looking forward: 2020-2050

Table A reveals two important differences between the past 30 years and the next 30 years. First, at a global level, the incremental food production task for the next 30 years is markedly smaller than in the previous 30 years. Second, this task is far more geographically concentrated. The global growth in food demand/supply from 2020-2050 projected by the two methods shown in Table A (32% for IMPACT and 26% for FARMS) is less than half of the corresponding growth figures for the period 1990 to 2020. This much smaller global production task is explained by much slower (in some cases negative) rates of population growth in most regions and a slowdown in the growth rate of food consumption per person. For example, in China, the average of the two projections shown in Table A equates to zero production growth from 2020 to 2050.

These simple observations have substantial implications. There are three regions where the production task remains salient: Sub-Saharan Africa, the Middle East and North Africa, and South Asia. In terms of meeting the 'great expectations' of food, land, and water systems, it is highly desirable for Sub-Saharan Africa and South Asia (given their larger sizes and production potentials) to meet their incremental food demands mostly through domestic production, for three reasons. First, Sub-Saharan Africa and South Asia are home to most of the world's poor, with the majority of these residing in rural areas and depending on the food sector for their livelihoods. Today, food, land, and water systems remain powerful levers for reducing poverty, improving livelihoods, and addressing inequalities.

Second, supplying healthy diets, a key 21st century objective, will require rapid growth in production of vegetables, fruits, and animal source foods. Compared with staple grain crops (e.g., rice, wheat, and maize), these components of a healthy diet are typically more difficult to transport over long distances, implying a greater reliance on local production.

Lastly, because global food, land, and water systems are interlinked via trade, aggregate domestic production growth that is roughly sufficient to cover demand in Sub-Saharan Africa and South Asia will lighten the incremental production push required in other parts of the world. For example, the ability of production systems in Sub-Saharan Africa and South Asia to successfully meet their incremental production tasks will result in reduced pressure to convert the Amazon rainforest to food production areas over the next 30 years. More generally, success in Sub-Saharan Africa and South Asia will allow the ingenuity of farmers, researchers, and other food, land, and water system actors in other regions to be directed towards meeting the full array of the 'great expectations'.

In sum, there is a compelling logic for a major push in food, land, and water systems-related research, notably in Sub-Saharan Africa and South Asia where complex economic, social, and environmental challenges are accompanied by a large incremental production task. Although the production task is substantially larger in Sub-Saharan Africa than in South Asia, the production task in South Asia relies on a tightly constrained and frequently distressed natural resource base. Hence, it is difficult to assess which of these two regions faces the greater challenge.

The CGIAR Portfolio

As in 1990—2020, research and innovations will play a critical role in meeting the world's 'great expectations' from 2020 to 2050. CGIAR's 2025—30 research and innovation Portfolio draws on CGIAR's global presence, diverse capabilities, and extensive partnerships to address the biggest global challenges of our time. Informed by emerging megatrends, responding to partner demand, and grounded in CGIAR's comparative advantage, the Portfolio will deploy CGIAR science and innovations to meet the diverse needs and opportunities of different regions. It will focus on the continued, critical need to close production gaps in the face of a broader range of interconnected climate, environmental, social, and geopolitical pressures in Sub-Saharan Africa, the Middle East and North Africa, and South Asia. In other regions, the Portfolio will further sharpen CGIAR's focus and contributions beyond incremental production increases while leveraging its networks to accelerate South—South learning and exchange.

Climate-Smart Village in Ilagan, Isabela, Philippines.
Credit: CIAT / Miguel Mamon

EXECUTIVE SUMMARY

This document sets out a high-level overview of CGIAR's proposed 2025—30 research and innovation Portfolio for review and feedback by the Independent Science for Development Council, the CGIAR System Board, and the CGIAR System Council. The document describes the key features of the Portfolio as a whole and provides brief descriptions of its nine 'Programs', three 'Accelerators', as well as CGIAR's work on Genebanks and Knowledge (Box 1).

Box 1. CGIAR's 2025—30 research and innovation Portfolio

Science Programs:

- Breeding for Tomorrow
- Sustainable Farming
- Sustainable Animal and Aquatic Foods
- Multifunctional Landscapes
- Better Nutrition
- Climate Action
- Policy Innovation
- Food Frontiers and Security

Scaling Program:

- Scaling for Impact

Accelerators:

- Gender Equality and Inclusion
- Shared Capacity
- Digital Transformation

Assets: Genebanks and Knowledge

The proposed Portfolio aims to raise the ambition for CGIAR science and innovations by bringing together and leveraging all of CGIAR's work, across all Centers and all sources and types of funding, in response to the most pressing global challenges. With a small number of entry points, the Portfolio aims to make CGIAR's offer easier to understand, communicate, engage with, and fund.

The Portfolio directly addresses the most significant global challenges across climate change; gender and social inequalities; poor-quality diets; rural poverty; environmental degradation; as well as fragility, conflicts, and violence. In doing so, it considers the ways in which those challenges are affected by key megatrends, such as demographic change, shifting consumption patterns, geopolitical instability, and emerging technologies.

Through a series of targeted 'Listening Sessions' and consistent with broader elements of CGIAR's revised Engagement Framework for Partnerships and Advocacy, the process to design the 2025—30 Portfolio aims to ensure that CGIAR's research and innovation offer is firmly grounded in partner and stakeholder priorities and interests at the local, national, regional, and global levels.

In addition to global challenges, megatrends, and partner demand; the new Portfolio will build on a careful analysis of CGIAR's comparative advantage in relation to potential, alternative service providers; and it will be informed by a structured priority-setting process that will include an assessment of potential positive and negative impacts and trade-offs across CGIAR's five Impact Areas.

The proposed Portfolio builds on and carries forward a significant share of the work and partnerships of CGIAR's current, 2022—24 Portfolio of Research Initiatives while creating space for new and emerging opportunities. Key functions of the current Impact Area Platforms will be integrated into the new Portfolio, with certain Programs and Accelerators playing dedicated roles as anchors to drive cohesion and learning in specific Impact Areas, e.g. Nutrition and Diets, Climate, and Gender and Social Inclusion.

The Programs, Accelerators, and Assets and Knowledge are designed to collectively deliver against a coherent CGIAR theory of change. Accordingly, all components of the Portfolio are deeply interdependent; with each Program and Accelerator providing and benefiting from inputs, guidance, tools, and networks to and from other programs.

The Programs and Accelerators are designed for six years from 2025 through 2030, with a robust, mid-term review moment at the end of 2027 to ensure that the Portfolio as a whole and all its components remain fit for purpose and appropriately prioritized.

The 2025—30 Portfolio is designed to encompass all sources and types of funding towards CGIAR research and innovations: CGIAR Trust Fund Window 1 as well as Window 3 and bilateral funding. The Programs and Accelerators will be funded through combinations of these different types of funding, with each governed and managed in accordance with applicable rules and agreements. Accordingly, the Programs and Accelerators aim to provide frameworks for greater complementarity and synergy across different sources and types of funding, while enhancing transparency and accountability in how they are used and the results they contribute to.

Drawing lessons from past cycles of CGIAR research, the 2025—30 Portfolio will be managed through a collaborative arrangement that brings together and draws on the best capabilities from across Centers and partners. For each Program and Accelerator, a cross-Center structure will drive effective sharing of data and information, coordination, collaboration, and alignment towards intended research outputs, outcomes, and impacts. A CGIAR Chief Scientist reporting to the Executive Managing Director will oversee the Portfolio, working in close collaboration with all Centers. For each Program and Accelerator, a leader or coordinator reporting to the Chief Scientist will drive strong collaboration and coordination on behalf of all partners involved.

Continuity of science and partnerships is a key priority as CGIAR transitions from the current, 2022—24 Portfolio to the Programs and Accelerators. Work is underway to set out a carefully managed, phased transition process that aims to mitigate the risk of disruption to CGIAR research and innovations, partnerships, staff, and funding.

1. Background on the Portfolio design

This document provides a high-level overview of the proposed 2025–2030 CGIAR Portfolio for review and feedback from the Independent Science for Development Council (ISDC), the System Board, and the System Council before the development of the more in-depth contents of the Portfolio for approval by the end of 2024.

The process to develop the next Portfolio was launched in mid-2023. An overview of the first version of this next Portfolio (2025–2027 Portfolio referred to as "P25") was circulated for stakeholder review on 15 December 2023. Feedback received from ISDC, the System Board, the System Council, and other stakeholders on this document was carefully analyzed and incorporated into the renewed thinking on the next Portfolio initiated by CGIAR's new leadership in January 2024.

On 21–22 January 2024, CGIAR's Executive Managing Director convened a Portfolio Retreat in Rome with a view to raising the ambition for CGIAR research and innovations. At the retreat, the participants – including Directors General and science leadership from all CGIAR Centers – agreed to launch a process to develop a more ambitious 2025–2030 Portfolio that responds to the most important and pressing global challenges and brings together all of CGIAR's work in a coherent way through a small number of Programs and Accelerators that span all sources of funding.

Following the Portfolio Retreat, writing teams were formed to design the nine Programs and three Accelerators. These writing teams bring together a diverse and representative group of more than 150 scientists from all CGIAR Centers and the World Vegetable Center, and seek inputs from beyond their membership, including CGIAR Science Leaders and key regional and national stakeholders, to allow the full depth and breadth of CGIAR's capabilities across Centers and partners to be harnessed to co-create the next Portfolio. Each writing team is convened by a convenor and co-convenor, who ensure that the teams deliver against guidelines and schedules.

A workshop for convenors and co-convenors took place in Nairobi on 18–20 March 2024, to advance a common understanding of the Programs and Accelerators, outline a process for their development, and provide guidance to the writing teams on the development of the May and September versions of the Portfolio design documents.

With the evolution of the Portfolio from P25 to the current, more ambitious version based on Programs and Accelerators, some of the milestones initially envisaged for January-May 2025 have been postponed (e.g., fully designed documents initially planned for submission in June are now to be submitted in September). This document includes a brief (~2 pages) description of each Program and Accelerator.

In parallel to these developments, CGIAR Listening Sessions were implemented in 25 countries in the first quarter of 2024 to better understand the demands for CGIAR research and innovations and collect suggestions from in-country partners on improving partnership modalities. This document contains key highlights from these sessions.

Finally, the preliminary findings of the ongoing Independent Advisory and Evaluation Services (IAES)-commissioned evaluation of Science Groups have been made available to the Program and Accelerator writing teams. Several have already been taken into account in this document.

Native potatoes in Peru.
Credit: Nani Vela

2. Addressing challenges and seizing opportunities

2.1 Key challenges and megatrends

The new Portfolio directly addresses major global challenges threatening the sustainability of food, land, and water systems and their transformation for the achievement of the Sustainable Development Goals (SDGs):

- **Climate change** affects food security in many ways, including through extreme events, such as acute drought, high temperatures, elevated atmospheric CO_2 levels, water scarcity, coastal inundation, marginalization of vulnerable people, and deep uncertainty about future risks. It is a risk multiplier, exacerbating existing challenges by decreasing the productivity and increasing the variability of agricultural production, inducing and aggravating the consequences of ecosystem breakdown and loss of ecosystem services (e.g., from unsustainable natural resource management practices), and reinforcing inequalities, all of which increase vulnerability and poverty.
- **Gender and social inequalities** are deeply entrenched within global and local agri-food systems. Women often have less control of and access to land, water, and other resources than men, and are less likely to claim and derive benefits from agriculture. Youth often find livelihood opportunities in food systems and agriculture to be unremunerative and unappealing. Moreover, the loss of local knowledge and local agricultural biodiversity erodes the opportunity to find local solutions to challenges such as climate change, malnutrition, inequities, and income generation.
- **Poor-quality diets** are a leading cause of all forms of malnutrition, along with poverty, gender and social inequalities, and inadequate water quality and sanitation. Malnutrition contributes to premature death and illnesses, with consequences for individuals, societies, and nations.

Farmer of the Gezira Irrigation Scheme, Sudan.
Credit: Abby Waldorf / WLE

For three billion people, mostly in low- and middle-income countries, healthy diets are unaffordable and therefore inaccessible. Moreover, after years of global progress, food insecurity has risen in recent years, with rates in 2022 higher than in pre-COVID years.

- **Rural poverty rates in low- and middle-income countries remain high** due to low productivity, income inequality, and high vulnerability of smallholder farming; the failure of agri-food systems to provide decent livelihoods; and the lag in skill development in many countries. Uneven economic growth in low- and middle-income countries hampers improvements in the income of rapidly growing populations.
- **Agriculture's environmental footprint remains large**, caused by unsustainable natural resource management practices and food loss and waste, among others. The negative environmental impacts of agriculture involve land degradation, biodiversity loss, the depletion and pollution of water resources, the overexploitation of aquifers, off-site pollution, fish stock depletion, and GHG emissions.

Each of the previous challenges **is most acute in areas beset by fragility, conflict, and/or violence**, where up to two-thirds of the world's extreme poor live. Violent conflict has spiked since 2010 and efforts to transform food, land, and water systems among the poorest and most vulnerable people require more research on and in these areas.

As noted in CGIAR's 2030 Research and Innovation Strategy, "under resource scarcity and global connectivity, the challenges of food and nutrition insecurity, poverty, gender inequality and social exclusion, climate change, and environmental degradation are simply not separable." These challenges intersect in complex ways, which vary by country and region. The ISDC study on megatrends sheds light on how specific trends will affect these challenges and on how CGIAR should respond to them (see Table 1). Systems approaches are required to understand trade-offs and synergies between challenges/megatrends and to design science- and evidence-based responses. The full Program and Accelerator design documents (to be submitted in September 2024) will include details on how each of them is strategically placed and offers a comparative advantage to address some of these challenges and trends.

The ISDC study on megatrends further recommends

- The following strategic shifts in the portfolio:
  - Increasing food diversity and quality
  - Strengthening governance of agri-food value chains
  - Building resilience and fostering inclusion among farmers
  - Focusing on the inclusion of youth
  - Prioritizing technology and education in agri-food system adaptation efforts
  - Applying climate learning from other sectors
  - Better managing competing demands for water across all sectors of our economies.
- And the following two process adjustments:
  - Adopting and using megatrends, foresight, and trade-off frameworks
  - Ensuring specific, measurable, achievable, relevant, and time-bound collective global targets.

Table 1. ISDC's changing Megatrends (MTs) affecting agri-food systems (ISDC, Responding to Emerging Megatrends, 2023)

MT 1 **Demographic trends**	The four key demographic megatrends (population growth, aging, migration, and urbanization) present interconnected socioeconomic challenges for agri-food systems globally, with rapid population growth in the Global South raising concerns about employment opportunities. This is a particular concern for youth, while urbanization poses additional challenges, such as unclear gender dynamics in migration and urbanization's significant contribution to climate change.
MT 2 **Changing consumption patterns**	The affordability of healthy diets is hindered by the proliferation of cheaper unhealthy foods, particularly ultra-processed options, contributing to malnutrition and an obesity epidemic. Healthy diets are unattainable for more than 3.1 billion people globally and this disproportionately affects Indigenous Peoples.
MT 3 **Market concentration in the agri-food system**	Increased concentration and consolidation along the agri-food value chain raise concerns about the implications for various actors, including marginalized workers. Research is needed to fully understand the complex effects of concentration on food security, nutrition, and health, particularly among vulnerable populations.
MT 4 **Climate change**	Climate change presents one of the greatest global challenges of the century, intensifying extreme weather events and posing significant risks to agriculture, ecosystems, human livelihoods, and biodiversity, with disproportionate impacts on women, children, and marginalized and Indigenous Peoples.
MT 5 **Environmental degradation**	The main driver of environmental degradation stems from land conversion for agriculture and resource extraction, agrobiodiversity loss remains a pressing concern, and a comprehensive understanding of the effects of market concentration on key agricultural resources is lacking, alongside increasing pressures on freshwater ecosystems due to anthropological activities and climate change.
MT 6 **Shifting global health challenges**	Infectious and noncommunicable diseases are driven by changing demographic trends, environmental degradation, land-use change, increased global connectivity, conflicts, climate change, pollution, technological advances, and repeated pathogen emergence from animal reservoirs. With the COVID-19 pandemic accentuating multidimensional inequalities and triggering a global economic crisis, disadvantaged groups have been disproportionally affected, especially in low- and middle-income countries.
MT 7 **Geopolitical instability**	The world faces a surge in violent conflicts, with about 70% of the chronically food-insecure residing in five conflict-affected countries by 2022. This exacerbates food insecurity and malnutrition, while the interconnection between climate change, ecological threats, migration, and conflict amplifies geopolitical tensions and inequalities, posing risks to food security and escalating gendered vulnerabilities. These include violence against women and children and displacement of Indigenous Peoples due to discriminatory policies and armed conflict.
MT 8 **Growing inequalities**	Persistent and expansive multidimensional inequalities, particularly affecting women, might increase further due to the slow and unequal recovery from the COVID-19 pandemic. Inequality is compounded by climate change, heightened conflict levels, and increased food prices, posing significant challenges for low- and middle-income countries with limited financial resources. These countries and their citizens experience compounded vulnerability despite their minimal contribution to climate change.
MT 9 **Frontier technology and innovation**	New technologies and innovations, including but not limited to digital technologies, artificial intelligence, solar photovoltaics, genome editing, and nanotechnology, hold transformative potential for agri-food systems. However, ensuring inclusive access to and investment in these opportunities in low- and middle-income countries is crucial to prevent exacerbating inequalities, particularly among marginalized groups such as women, youth, and ethnic minorities. Challenges include low digital literacy, gender gaps, limited access to digital connectivity, and high costs of devices and services.

2.2 CGIAR's Strategy to 2030

CGIAR's 2030 Research and Innovation Strategy sets out a 10-year vision of "a world with sustainable and resilient food, land, and water systems that deliver diverse, healthy, safe, sufficient, and affordable diets, and ensure improved livelihoods and greater social equality, within planetary and regional environmental boundaries." The Strategy defines CGIAR's mission as follows: "to deliver science and innovation that advance the positive transformation of food, land, and water systems in a climate crisis."

The transformations that CGIAR aims to contribute to alongside partners are captured in CGIAR's five Impact Areas and eleven Impact Area targets. The Impact Areas – climate change adaptation and mitigation; environmental health and biodiversity; nutrition, food security, and health; gender equality, youth, and social inclusion; and poverty reduction, jobs, and livelihoods – and their targets closely align with the SDGs. They reflect areas in which CGIAR has demonstrated a strong capability to deliver through integrated systems approaches. CGIAR's key impact pathways outlined in the 2030 Strategy remain relevant and include the development and scaling of science- and evidence-based innovations; targeted capacity development; and advice on policy and investments in food, land, and water systems.

Overall, the 2030 Strategy remains relevant and appropriate, and the proposed 2025–2030 Portfolio is intended to accelerate and strengthen the implementation of that Strategy – not replace it. Through the 2022–2024 Portfolio of Research Initiatives and Impact Area Platforms, the first years of implementation of the 2030 Strategy have seen unprecedented collaboration and integration across Centers and disciplines; a consistent focus on multiple benefits across the five Impact Areas; and a renewed emphasis on research-into-use. Areas to strengthen include, *inter alia*, stakeholder engagement in Portfolio design, decreasing the number of Portfolio entry points and the resulting complexity and transaction costs, and providing for greater integration and complementarity across pooled and bilateral funding.

Over the next six years, in line with the 2030 Strategy's ways of working, and to raise CGIAR's ambition and become even more relevant in addressing critical global challenges and megatrends, the new 2025–2030 Portfolio will strengthen efforts to (1) embrace a systems transformation approach to deliver multiple benefits; (2) forge ambitious alliances for change; (3) position regions, countries, and landscapes as foci for partnerships and impacts; (4) consider multiple transformation pathways to respond to different contexts; (5) put greater emphasis on risk management and resilience; (6) harness innovative finance to spur investment in scaling innovations; and (7) integrate digital methods and tools to support decision making.

Building on and complementing the 2030 Strategy in an effort to clearly capture CGIAR's contribution to the world, the participants in the January 2024 CGIAR Portfolio Retreat aligned on a CGIAR Value Proposition (see Box 2).

Box 2. CGIAR's Value Proposition

Championing equitable access to food and balanced nutrition for all people while enhancing ecosystem services and biodiversity, through increasing the sustainability of agriculture and of food, land, and water systems in low- and middle-income countries, catalyzing global networks for science and innovation, capitalizing on local knowledge and diversity, and influencing decision makers. We operate within a global public goods framework and measure our impact through contributions to nutrition and food security, poverty reduction, gender equality and social inclusion, climate adaptation and mitigation, and environmental health and biodiversity.

2.3 Responding to demand

The System Council, at its 19th meeting, requested that "the Portfolio […] be built through a transparent, inclusive co-creation process, and supported by country and regional engagement and strengthened partnerships." To achieve this, the proposed 2025–2030 Portfolio leverages the frameworks, principles, approaches, tools, and efforts developed and carried out in recent years to ensure that CGIAR's research and innovation offer is grounded in partner and stakeholder priorities and interests locally, nationally, regionally, and globally.

The Portfolio design process draws on lessons from and feedback on the design and implementation of the 2022–2024 Research Initiatives and Impact Area Platforms. Specifically, stakeholders have requested that CGIAR engage in an inclusive and open listening posture to collaboratively design and implement its programs. In response, starting in 2022, CGIAR introduced Portfolio Dialogues and set up various partnership agreements to help align the current Portfolio more closely with country and partner needs.

Beyond programmatic alignment, in its January 2023 report, the High-Level Advisory Panel to the CGIAR System Board on improving strategic engagement with partners called for CGIAR to "develop and implement a visible process for inclusive agenda-setting, co-design, and co-ownership of all aspects of One CGIAR efforts." CGIAR has since updated its Engagement Framework for Partnership and Advocacy and begun developing a Partnership Strategy, as well as continued to strengthen its partner and stakeholder engagement through a network of Country Convenors, a partnership intelligence function, and a policy advocacy function that builds on global and regional advocacy platforms for collective action.

Thus, the design of the 2025–2030 Portfolio represents a critical opportunity for CGIAR to demonstrate its commitment to deeper engagement as well as inclusive and demand-driven research and innovations. To achieve this, a series of targeted Listening Sessions was launched in January 2024 to help identify and understand partner needs and thereby shape the evolution of CGIAR's research and innovation offer. To date, Listening Sessions have been held in 25 priority countries, along with a regional pilot in East Africa. Further information on the objectives and achievements of the Listening Sessions can be found in Box 3.

The writing teams have used the initial outputs of the Listening Sessions in their high-level descriptions of the Programs, Accelerators, and Genebanks (see Section II). In addition, the writing teams will engage with partners throughout the Portfolio design process. This engagement will build on previous efforts under the 2022–2024 Portfolio of Initiatives and Platforms as well as on Centers' bilateral projects, with a view to ensuring continuity of ongoing dialogues and key partnerships.

Looking forward, the implementation of the 2025–2030 Portfolio will be guided by regular and scientifically structured interactions with CGIAR's partners and stakeholders at all levels, with results regularly communicated across the Programs and Accelerators to ensure continuous adaptation in response to evolving demands. The Scaling Program includes regular regional- and national-level stakeholder engagement as one of its core functions, building on the design lessons from the Listening Sessions (see Section II).

Box 3. Objectives and achievements of the Listening Sessions

Objectives

- Shape the CGIAR 2025–2030 Portfolio and research-for-development agenda
- Deepen future collaboration for transformative partnerships
- Improve CGIAR engagement models at country, regional, and global levels

Approach

- In each country, the CGIAR Country Convenor and a small multi-Center team led a one-week process with three to five small segmented groups of critical stakeholders.
- The sessions focused on (1) how CGIAR can contribute to greater impact and (2) how to improve CGIAR's partnership modalities.
- Each set of Listening Sessions built on previous in-country stakeholder engagement outcomes.

Achievements and deliverables as of April 2024

- Guidelines, methods, and tools for holding Listening Sessions co-developed, tested, improved, and shared across CGIAR
- Listening Sessions completed in 25 countries (17 countries with host country agreements with CGIAR and/or large CGIAR research-for-development footprint, and 8 additional countries)
- 20 output reports shared with stakeholders, writing teams, and CGIAR staff.

Initial results on how CGIAR can contribute to greater impact

- Continued focus on food security and nutrition in vulnerable countries
- Scientific capacity sharing
- Co-developing breeding resources as equal partners
- Co-leading and convening policy advocacy platforms (using CGIAR's soft power)
- Open access to consolidated databases, dataset analysis, infrastructure, and knowledge management
- Landscape approach to in-country agricultural research-for-development and implementation
- Building expertise in emerging areas, with several specific areas proposed.

Initial results on how to improve CGIAR's partnership modalities

- Single CGIAR point of contact for partners in a country
- Institutionalizing the Listening Sessions model (periodic meetings with in-country governance actors)
- Equal recognition of partners in scientific outputs
- Enhanced transparency in project partnership processes (joint planning and co-creation, information sharing platform, transparent bidding for partner opportunities…).

2.4 Leveraging CGIAR's track record of impact for higher ambition

The proposed 2025–2030 Portfolio builds on a well-documented track record of impact. Large impacts from CGIAR's breeding research have been well demonstrated over the years (Fuglie and Echeverria 2024 being the latest in a line of studies). In addition, over the past decade, evidence of CGIAR's broader contributions along its three main impact pathways has been documented in areas such as food and nutrition, environment, climate change mitigation and adaptation, gender equality, and poverty reduction (see for example CGIAR contributions to the 2022 System-Level Outcome Targets) and through the nearly 1,400 policy, innovation, and capacity outcomes reported from 2017 to 2023[1] (see 2017–2021 and 2022–2023 CGIAR Results Dashboards). These outcomes have occurred in all regions where CGIAR works (East and Southern Africa; West and Central Africa; Central and West Asia, and North Africa; Southeast Asia and the Pacific; South Asia; and Latin America and the Caribbean), showing that CGIAR is able to meet demand and facilitate use of its research in a wide range of contexts.

CGIAR has continued to deliver effective and impactful research and innovations while steadily growing the scope of its work in response to increasingly complex and interconnected global challenges. Building on this experience, CGIAR is well placed to raise its ambition and fully deliver on its 2030 Strategy through

- Greater co-location of the thematic components of the Portfolio to deliver on the most significant global challenges across pooled and bilateral funding sources, and stronger coordination and integration of co-located components;
- Improved alignment with national priorities, strategies, and commitments;
- Deepened high-leverage partnerships, including with international financial institutions, expanded partnerships in sectors beyond agriculture to drive transformation, more partnerships with the private sector, and further engagement with multistakeholder platforms;
- Stronger alignment and coherence across scales (e.g., from global to regional to national), with a view to reaching impact at scale; and
- More coherent and collaborative management across Programs, Accelerators, and Centers – for example, to bring together scientists working on similar research challenges to foster the development and use of cutting-edge science that will generate achievements of higher value.

With these improvements, CGIAR will be able to generate more complementary, impactful research that influences decisions from global to local, and collectively drive food, land, and water systems transformations throughout low- and middle-income countries.

Locally and **nationally**, CGIAR supports nationally determined priorities for food, land, biodiversity, and water systems transformation in priority low- and middle-income countries, and strengthens targeted capabilities across a range of disciplines, sectors, and countries to enhance country-led research and stimulate transformative change at scale in food, land, and water systems.

1 The average of about 200 outcomes per year has been maintained by the initiatives, despite reporting on only the pooled funded portion of the Portfolio.

Examples of such work include the following:

- Assist countries in creating decent jobs in food, land, and water systems;
- Use systems-oriented, integrated approaches to develop innovations that enable countries to meet their commitments in the agricultural, environmental, and food sectors (e.g., develop NDCs to reduce GHG emissions, plans to achieve land degradation neutrality, National Biodiversity Strategies and Action Plans, and Global Biodiversity Framework targets as part of coherent agri-food systems transformation pathways);
- Co-create solutions in the use of local diversity, seed and market systems, food value chains, and food environments that decrease the costs of and increase access to sustainable healthy diets;
- Develop landscape approaches that enrich the natural resource base, decrease the environmental footprint and inequalities in agriculture, and generate sustainable livelihoods;
- Support inclusive policy processes and propose enabling policy options that foster synergies between sectors and administrative levels in meeting multiple objectives and mitigating trade-offs;
- Strengthen the capacity of institutions that formulate and execute plans and policies related to food, land, and water systems transformation (including national agricultural research institutes, international financial institutions, and other key organizations part of agricultural innovation systems or the environmental and food sectors) in using methods, tools, and information for them to be better equipped to meet their own analytical demands and needs.

Regionally, CGIAR supports regional cooperation strategies and strengthens regional research networks and other partnerships to develop, disseminate, and use research results.

Examples of such work include the following:

- Conduct regular dialogues with regional partners to identify priorities for collaborative research and scaling activities;
- Engage with regional research networks to strengthen CGIAR research and facilitate the adaptation of results developed elsewhere in a region where demand exists;
- Provide technical support toward regional policy organizations and networks' planning and cooperation objectives (e.g., South Asian Association for Regional Cooperation, Economic Community of West African States, African Group of Negotiators Expert Support);
- Implement capacity-sharing approaches and South-South learning to meet core capacity needs of partners in food, land, and water systems research, policy analysis, and scaling of innovations.

Globally, CGIAR aims to contribute to global policy processes to drive public and private investment toward food, land, and water systems transformations that address multiple SDG objectives, and to produce high-quality global public goods that influence discourses and actions and encourage further research by partners in priority and novel areas. This is conducted in collaboration with strategic partners, namely, FAO and other UN organizations.

Examples of such work are the following:

- Coordinate and communicate CGIAR's offer to support Multilateral Environmental Agreements (e.g., United Nations Convention to Combat Desertification, United Nations Framework Convention on Climate Change, Convention on Biological Diversity) and the follow-up to the United Nations Food Systems Summit;
- Develop metrics and methods that can be used by national and international partners to assess resilience to climate change and measure contributions to GHG emission reduction in food, land, and water systems, thus accelerating the inclusion of agriculture and food and water security in climate change finance discussions;
- Identify innovations, interventions, policies, and programs that have been demonstrated to work toward meeting SDGs and can be scaled up through international financial institutions (e.g., World Bank, IFAD, ADB, AfDB, IsDB) and global initiatives (e.g., Scaling Up Nutrition);
- Contribute to global assessments that inform global policy processes (e.g., Intergovernmental Panel on Climate Change, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services).

2.5 Priority-setting within the Portfolio

Along with an ambitious mission to contribute to food, land, and water systems transformation toward multiple Impact Areas, the potential scope of CGIAR's research Portfolio is larger than in the past. Therefore, attention to priority-setting in the 2025–2030 Portfolio is paramount, at both the Portfolio and Program/Accelerator levels. Priorities should be refreshed periodically (e.g., every three to five years) to respond to evolutions of challenges, megatrends, strategic opportunities, and unforeseen risks.

In addition to the ability of different potential research areas to address challenges and megatrends (see Section 2.1) and demand from stakeholders (see Section 2.3), a key element to consider for comparing alternative uses of scarce resources is the analytical assessment of potential positive and negative impacts across the five Impact Areas (accounting for synergies and trade-offs) of different research areas, innovations, and policy and scaling pathways; of how these impacts are affected by geographical, temporal, and contextual factors; of the likelihood of adoption of innovations and policies; and of the feasibility of producing the needed research outputs.

A significant body of evidence is available to inform such an assessment, much of which has been generated by CGIAR itself. In combination with the use of CGIAR's *ex ante* modeling tools to project impacts (see, for example, this paper on prioritization of research), this evidence can be harnessed to provide inputs into prioritization processes at different levels within CGIAR.

Building on successful examples of prioritization (e.g., in Genetic Innovation, see Box 5), CGIAR will advance a rigorous priority-setting process (more details forthcoming in the next version of the Portfolio narrative).

Another element to be included in the priority-setting is comparative advantage, which is discussed in Section 3.

3. Harnessing CGIAR's comparative advantage

3.1 Applying the ISDC framework to analyze comparative advantage

According to the ISDC framework and methodology, comparative advantage analysis starts by defining the key pieces of work to be delivered. Therefore, this methodology will be applied at the **Program/Accelerator level.** It is proposed that each Program select key deliverables for this analysis, to be included in the design documents submitted in September. During the Programs' and Accelerators' inception phase, in which more detailed planning of delivery with partners will take place, updated comparative advantage analyses could be undertaken.

The comparative advantage methodology consists of four major steps (see Box 4):

The work of the Alliance's Genetic Resources Unit to regenerate bean seeds, at a field site near Popayán, Colombia.
Credit: CIAT / Neil Palmer

Box 4. The four steps of comparative advantage analysis

1. **Describing desired deliverables that contribute to the Program or Accelerator outcomes**

   These are "the set of major knowledge, products, and services that need to be brought together to achieve CGIAR's intended development outcomes and impacts."

2. **Identifying alternative service providers and potential partners**

   These are identified based on their interests and capabilities in relation to the proposed deliverables. Some may be competitors and some may be candidates for collaboration.

3. **Assessing relative trade-offs between activities and providers**

   This is challenging for the complex, interrelated deliverables needed to transform food systems. We will "use quantitative information when possible and qualitative assessments when necessary."

4. **Planning partnerships**

   These could include ongoing partnerships that are part of CGIAR's existing capital as well as new partnerships identified in the process of assessing comparative advantage.

Identifying core sources of comparative advantage at **CGIAR level** (part of the ISDC methodology) is necessary for informing the design of the Programs and Accelerators and calibrating their levels of ambition. In addition, elucidating the sources of comparative advantage at CGIAR level provides a framework for alignment by the Programs and Accelerators. The ISDC method has four main sources of comparative advantage: incentives, human capital, biophysical capital, and social capital. Box 5 provides a non-exhaustive list of CGIAR's comparative advantages for each source.

In delivering impact across the five Impact Areas, the comparative advantage of CGIAR as a whole lies at the intersection of these sources of comparative advantage.

CGIAR's ambitious mission and position as a provider of global public research goods in food, land, and water systems enables it to participate as a credible and legitimate science and knowledge partner. The emphasis it places on the effectiveness and use of research implies that it must be dynamic and responsive to changing trends and demands.

At the forefront of CGIAR's ability to deliver impact is CGIAR's human capital, including 9,000 scientists specialized in a wide range of disciplines and most of whom are based in low- and middle-income countries. This engine of expertise, along with CGIAR's intellectual assets and past research, provides a solid body of experience for CGIAR to reliably contribute to the understanding of food, land, and water systems, and how to transform them. Bringing this expertise and experience together with that of CGIAR's partners provides a unique foundation for achieving impact.

Box 5. Key sources of CGIAR's comparative advantage

Incentives

- Global mandate to deliver global public goods
- Research-for-development objective, with a focus on the use of research
- Strong demand for research, capacity sharing, and scaling support from national governments and global public funding agencies and institutions

Human capital

- Large number of diverse (across many dimensions such as scientific discipline, nationality, and gender) scientific staff in low- and middle-income countries
- Expertise and experience in developing and applying research approaches (e.g., systems research, participatory research, gender-transformative research…)
- World-renowned expertise in numerous disciplines (e.g., breeding, gender and social inclusion, farm management, systems modeling, climate change, and scaling science)
- Unique intellectual assets (models, methods, metrics, datasets…)

Biophysical capital (in low- and middle-income countries)

- Genebanks, germplasm health units, and crop and animal breeding laboratories
- State-of-the-art laboratory and field facilities for crop, livestock, and aquatic food research
- Experiment stations for long-term crop, animal, and natural resource management field trials
- Laboratories for soil, water, analytical chemistry, nutrition, food safety, and greenhouse gas analysis

Social capital

- Long-term presence across low- and middle-income countries, built upon long-term agreements with countries, long-lasting partnerships, and emerging novel partnerships
- Partnerships and networks that extend from research to implementation and from local to global
- Honest convener for inclusive partnerships
- Established track record for high-quality multidisciplinary research

CGIAR's human capital is supported by its biophysical capital. Genebanks, experimental field trials, and research facilities are some of the key assets that CGIAR and partners rely on to deliver cutting-edge science that leads to impact. The global spread of biophysical capital allows CGIAR to respond to demand in all regions.

CGIAR's social capital, through existing and emerging partnerships, further cements CGIAR's advantage in delivering impact. Partners' trust and engagement allow CGIAR to share knowledge and capacities with those of partners to generate high-quality and impactful science. Moreover, these strong partnerships ensure that CGIAR's expertise is channeled into the relevant research areas – delivering demand-driven science.

As stated in the ISDC report, "within partnerships, CGIAR's comparative advantage will commonly emerge from its ability to function as an integrative platform that facilitates complementary

Woman making bread in a riverside community in Pando, Bolivia.
Credit: Amy Duchelle / CIFOR

research investments and activities, as well as its capacity to deploy its substantial scientific expertise and in-region facilities toward low-commercial-value/high-social-value, high-risk, long-horizon R&D that contributes to context-specific agricultural innovation."

Furthermore, as noted in ISDC's technical note on inclusive innovation, CGIAR can strengthen its comparative advantage in context-specific, transformative agri-food systems research by building its co-innovation capacity.

Although the sources of comparative advantage described above need to be assessed for specific deliverables and against specific alternative service providers, overall, they support several capabilities unique to CGIAR within food, land, and water systems:

- Undertaking multi-scale, interdisciplinary research that aims to address multiple interconnected challenges that respond to demands from stakeholders at different levels, from local to global;
- Forging partnerships that span across global, regional, national, and local partners to co-design research;
- Undertaking research across diverse environments (by developing general principles with broad application and specific knowledge of what works where); and
- Conducting research along impact pathways from discovery to implementation and scaling support to *ex post* evaluation of interventions.

Box 6. Comparative advantage analysis from the Genetic Innovation Science Group

How does CGIAR and partners' crop breeding work in tandem to have the greatest impact on global challenges? Identifying and using comparative advantage

Building on progress made by the Excellence in Breeding Platform (2017–2021), from 2018 to 2022, the Accelerated Breeding Initiative undertook extensive consultations with NARES partners, CGIAR breeding leads and directors, industry experts, and funders to clarify institutional mandates, identify comparative advantage, and develop a baseline division of breeding activities across NARES-CGIAR breeding pipelines (see Figure 1). In 2022 and 2023, during the *Senior Leadership Consultation Meeting of CGIAR-NARES breeding networks* (see 2022 and 2023 Aide Memoires), Accelerated Breeding and NARES partners identified the need to more granularly align this split. Following this, Accelerated Breeding developed a standardized and scalable methodology for peer and self-assessment of CGIAR and partners' levels of breeding activity, strengths, opportunities, and ambitions. This assessment helps determine partners' capacity to deliver breeding activities in the NARES-led breeding functions (the green section of Figure 1) and informs their roles and responsibilities based on their strengths and mandates.

In line with ISDC's methodology for assessing comparative advantage, this assessment defines key deliverables through product design team meetings, where CGIAR and NARES partners jointly align breeding objectives with national priorities and help define national Target Product Profiles (TPPs). Using the national TPPs (breeding priorities) as a foundation, the standardized breeding program assessments provide a tier rating (1 to 5) defining the capacity of each partner to contribute to regional breeding efforts. In addition, the assessment defines opportunities and ambitions for improving each partner's capacity to deliver on its objectives and TPPs in the future. These results are complemented with a breeding station assessment in which the infrastructure, equipment, and field operations of the NARES program are assessed using a template developed by Excellence in Breeding and now used by the Breeding Resources Initiative.

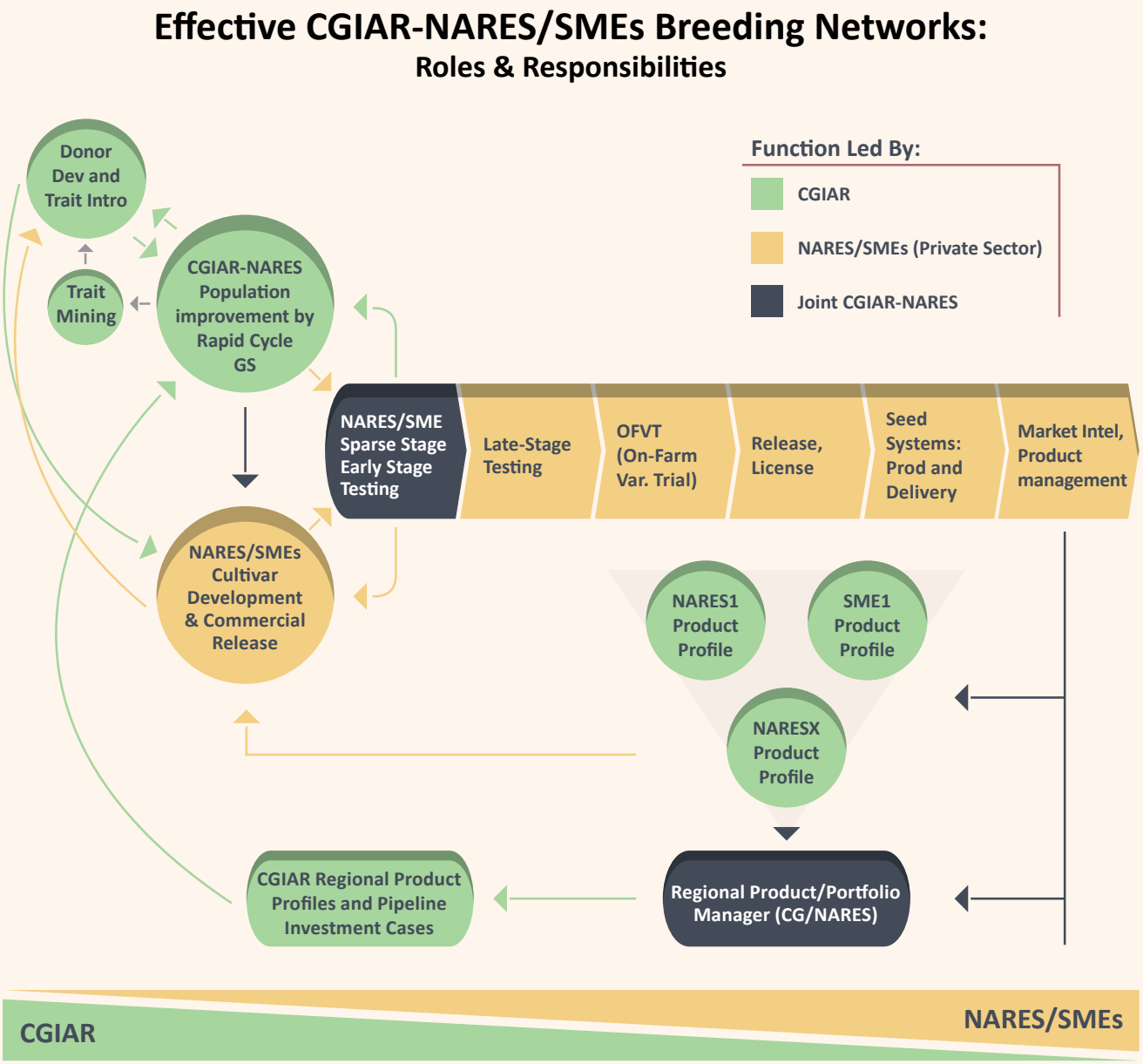
These combined assessments provide baseline information for understanding where partners can contribute to CGIAR-NARES breeding networks to achieve their breeding objectives, where they are best placed to do so (i.e., comparative advantage), and how their roles and responsibilities in regional network activities can be augmented over time, based on their and CGIAR's comparative advantages and ambitions. For example, NARES partners in several networks, largely in sub-Saharan Africa (matooke, maize, groundnut, sorghum), are taking on a greater share of the breeding activities within the pipeline for specific market segments in which they have suitable germplasm, human capacity, and operational setup. This results in increased operational budget for NARES to scale their breeding activities and contribute entries to regional trials for those particular market segments.

In 2023, more than 50 NARES breeding programs were assessed. As a result, they are able to participate actively in joint priority-setting, plan capacity strengthening to best meet the needs of the whole breeding network, and assume a growing share of breeding responsibilities. NARES and CGIAR breeding teams also developed and agreed on 26 indicators of breeding process performance, which will be used by NARES-CGIAR breeding networks. They comprise executive- and management-level indicators that capture performance measures, improvement needs, and elements that drive genetic gains. From these indicators, context-specific KPIs will be developed. The results move NARES-CGIAR breeding networks toward harmonized and informative metric-driven learning and further incentivize implementation of strategic process improvement and breeding modernization across all partners.

Some recent examples help illustrate these processes in practice. In Uganda, the NARO matooke breeding program has assumed total responsibility for final hybrid development, while IITA (the regional CGIAR network coordinator) is increasingly focused on upstream research and population improvement. In Kenya, KALRO has received additional network funding to lead maize hybrid development for the highlands market segment, where it has a comparative advantage (germplasm, research stations) relative to CIMMYT and IITA. For many dryland crops such as groundnut and pigeon pea, networks have decided to share pipelines between CGIAR and specific national programs that have sufficient breeding capacity. In these arrangements, operational resources to breed products for a particular market segment are shared between a CGIAR Center and national program, according to a clear, costed workplan that specifies partners' roles. These examples illustrate the shift toward a partnership of equals based on comparative advantage within CGIAR-NARES regional breeding networks throughout sub-Saharan Africa.

Colombia's eastern plains, or Llanos.
Credit: Neil Palmer / CIAT

Figure 1. Accelerated Breeding Initiative's model for engaging with CGIAR-NARES networks to determine comparative advantage and roles and responsibilities in breeding pipelines



3.2 CGIAR's roles alongside partners

The CGIAR Engagement Framework for Partnership and Advocacy distinguishes three main types of CGIAR partners according to the stage of the theory of change in which the collaboration occurs: demand partners, innovation partners, and scaling partners. A given organization can play multiple roles, for example, as a scaling partner (driving the uptake of a CGIAR innovation) and as an innovation partner (co-testing a scaling method). Partners can also be further categorized by nature, for example, governments, national and international NGOs, international financial institutions (IFIs), multilateral institutions, private sector, farmers' organizations, or NARES. Combined analysis of these partnership dimensions provides the basis for defining a partnership strategy for CGIAR and at the Program/Accelerator level.

CGIAR's role in relation to partners varies along the impact pathway. CGIAR co-identifies priorities for research with demand partners and co-generates scientific outputs with innovation partners. Further down the impact pathway into spheres of influence and interest, other organizations (e.g., IFIs, private sector, extension systems, NGOs, national policy advisory think tanks) have advantages over CGIAR for scaling innovations and influencing policy. CGIAR therefore focuses on engaging with these scaling partners to promote the uptake of scientific outputs and support scaling processes through activities such as transforming scientific results into more accessible formats, providing training and guidelines, and developing finance and scaling approaches.

Innovation partners' roles in co-generating research outputs and expressing demand for CGIAR's research depend on their capabilities. Usually, demand exists for methods, tools, and services that are not available within these organizations. Conversely, CGIAR benefits from accessing methods shared by partners, for example, state-of-the-art breeding processes and methods (e.g., from the private sector), global modeling tools (e.g., through AgMIP), and the use of digital tools and AI approaches (e.g., from big data companies and remote-sensing centers).

Another role of CGIAR is to convene partnerships that can effectively generate globally and regionally relevant research to develop

solutions to food, land, and water systems challenges. These cross-country partnerships strongly emphasize mutual capacity sharing and strengthening.

CGIAR's roles alongside partners have evolved and will continue to evolve. For instance, as noted in ISDC's technical note on inclusive innovation, CGIAR should continuously pursue strategies to develop more inclusive and effective partnerships. Furthermore, in addition to bringing partners into CGIAR's impact pathways, CGIAR positions itself to support partners' own impact pathways, which also affects the dynamics of CGIAR and partners' roles.

The CGIAR Engagement Framework provides a set of principles to guide the conduct of CGIAR partnerships: (1) complementarity for impact toward common objectives; (2) shared ownership that includes equity and respect; (3) focus on results, especially on outcomes from the research; (4) transparency and accountability; (5) integrity, including adherence to standards and best practices, (6) calculated risk – identifying potential risks and jointly defining measures to address them, and (7) learning culture.

4. A restructured Portfolio

4.1 Moving to a new structure of Programs, Accelerators, and Assets

Building on and implementing CGIAR's 2030 Research and Innovation Strategy, addressing the most significant global challenges and implications of evolving megatrends, responding to partner and stakeholder demand, and leveraging CGIAR's comparative advantage and track record of impact, the proposed 2025–2030 Portfolio is set out in eight Science Programs, one Scaling Program, and three Accelerators,[2] underpinned by CGIAR's Genebanks and other long-term strategic Assets and Knowledge (see Box 1).

Box 1. CGIAR's 2025—30 research and innovation Portfolio

Science Programs:

- Breeding for Tomorrow
- Sustainable Farming
- Sustainable Animal and Aquatic Foods
- Multifunctional Landscapes
- Better Nutrition
- Climate Action
- Policy Innovation
- Food Frontiers and Security

Scaling Program:

- Scaling for Impact

Accelerators:

- Gender Equality and Inclusion
- Shared Capacity
- Digital Transformation

Assets: Genebanks and Knowledge

2 The names of the individual Programs and Accelerators have been updated from the version of this document that was submitted for review by the Independent Science for Development Council on 8 May 2024. They remain under review and may change before the submission of the final version of this Portfolio Narrative and full Program and Accelerator design documents later this year.

Moving from the current Initiatives and Impact Area Platforms to Programs and Accelerators reflects two fundamental changes in CGIAR's approach: (1) organizing the Portfolio around the most significant existing and emerging global challenges and addressing these through cutting-edge science and (2) aligning pooled and bilateral funding to provide a "whole-of-CGIAR" offer and contribute to shared goals and delivery of impact.

The new structure enables CGIAR's recommendations and findings to be more easily drawn and communicated from the entire Portfolio, across all funding sources. Science Programs serve as entry points to describe CGIAR's offer on a key topic, elevating CGIAR's visibility in global agendas and facilitating the continuation and formation of inclusive alliances and partnerships. The Accelerators and the Scaling Program will undertake strategic research in their topical areas as well as bolster CGIAR's ability to reach and support targeted end-users while furthering collaboration, coherence, and integration across the entire Portfolio. The Accelerators and the Scaling Program thus work across all eight Science Programs.

The current Impact Area Platforms have four functions: (1) fostering global critical thinking, use of evidence, and appropriate metrics around the Impact Area; (2) increasing internal capacity across CGIAR through strengthening and sharing common tools, standards, datasets, cutting-edge science, and knowledge management; (3) amplifying CGIAR's external profile and voice by engaging in and shaping global policy discourse; and (4) advising management on the identification and performance of CGIAR Initiatives. The first three functions remain highly relevant; however, with the decreased number of research vehicles and the integration of bilateral and pooled funding, they no longer require separate structures and will therefore be integrated into the relevant Programs and Accelerators. As a result, the Impact Area Platforms will close on 31 December 2024. Section II provides preliminary ideas about how the Programs on Climate Action; Better Nutrition; and Multifunctional Landscapes and the Accelerator on Gender Equality and Inclusion will integrate the functions of the Climate Change Adaptation and Mitigation; Nutrition, Health, and Food Security; Environment and Biodiversity; and GENDER Impact Area Platforms, respectively.

The new Portfolio structure aligns with recommendations made in recent IAES-commissioned evaluations. Three of the recommendations from the CRP Synthesis Evaluation are reflected explicitly in the new structure: (1) the recommendation to "focus much more on institutional capacity development, especially of national 'boundary' partners" is reflected in the Accelerator on Shared Capacity; (2) the recommendation to "foster adoption of technical and social innovations at scale, as required to achieve system transformation, and give greater emphasis to research on scaling science and implementation science," is taken up as a core objective of the Scaling Program; and (3) the "wholesale review of CGIAR capacities and opportunities around big data and practical field applications for pro-poor sustainable development" will be coordinated by the Accelerator on Digital Transformation. Similarly, the creation of an Accelerator on Gender Equality and Inclusion underscores the need to raise the ambition of CGIAR's gender research throughout the Portfolio in alignment with the recent GENDER Platform Evaluation.

The science from CGIAR's 2022–2024 Portfolio will be transitioned into the relevant Programs (see Table 2). The 2025–2030 Portfolio builds upon ongoing work, creating a solid foundation for continuity while also expanding into emerging areas of science for impact.

The Programs and Accelerators are designed for six years (from 2025 through 2030), with a robust mid-term review at the end of 2027 to ensure that the Portfolio as a whole and all of its components remain fit for purpose and appropriately prioritized based on performance over the first three years of implementation and in the face of evolving global challenges and megatrends, partner and stakeholder demand, as well as CGIAR's comparative advantage and capabilities.

Table 2. Simplified draft mapping of 2022-24 Initiatives into Programs, Accelerators, and Assets

Program/Accelerator/ Genebanks	Primary Initiatives*	Secondary Initiatives**
Science Program on Breeding for Tomorrow	• Accelerated Breeding • Breeding Resources • Market Intelligence • Seed Equal	• Plant Health
Science Program on Sustainable Farming	• Excellence in Agronomy • Plant Health • Mixed Farming Systems	• Seed Equal • Agroecology • Fruit and Vegetables for Sustainable Healthy Diets
Science Program on Sustainable Animal and Aquatic Foods	• Livestock and Climate • Sustainable Animal Productivity • One Health • Aquatic Foods	• Low-Emission Food Systems • Mixed Farming Systems
Science Program on Multifunctional Landscapes	• Agroecology • Nature-Positive Solutions	• Mixed Farming Systems • Livestock and Climate • One Health

Program	Primary Initiatives*	Secondary Initiatives**
Science Program on Better Nutrition	• Rethinking Food Markets • Sustainable Healthy Diets • Fruit and Vegetables for Sustainable Healthy Diets	• Accelerated Breeding • Resilient Cities
Science Program on Climate Action	• Climate Resilience • NEXUS Gains • Low-Emission Food Systems	• Accelerated Breeding • Gender Equality • Fragility, Conflict, and Migration • Livestock and Climate
Science Program on Policy Innovation	• Foresight • National Policies and Strategies	• Gender Equality • NEXUS Gains • Rethinking Food Markets
Science Program on Food Frontiers and Security	• Fragility, Conflict, and Migration • Resilient Cities	• Market Intelligence • Foresight • Digital Innovation • Nature-Positive Solutions
Scaling Program	• Transforming Agri-Food Systems in South Asia • Diversification for Resilient Agribusiness Ecosystems in East and Southern Africa • AgriLAC Resiliente • Asian Mega-Deltas • From Fragility to Resilience in Central and West Asia and North Africa • West and Central African Food Systems Transformation	• Seed Equal • Nature-Positive Solutions
Accelerator on Gender Equality and Inclusion	• Gender Equality	• Market Intelligence
Accelerator on Shared Capacity	• N/A	• N/A
Accelerator on Digital Transformation	• Digital Innovation	• Breeding Resources
Genebanks	• Genebanks	• Breeding Resources • Accelerated Breeding • Plant Health

* The whole Initiative or the vast majority of the Initiative's work is expected to be incorporated into the relevant Program/Accelerator.

** A small component of the Initiative's work is expected to be incorporated into the relevant Program/Accelerator.

Ethiopia Field Visit 2019.
Credit: Mulugeta Ayene / WLE-CGIAR

4.2 Improved Portfolio coherence supporting CGIAR's theory of change

4.2.1 CGIAR's theory of change

Figure 2 depicts a simplified CGIAR-level theory of change (ToC).

The CGIAR ToC begins with grand challenges in food, land, and water systems, coupled with the ISDC megatrends (see Column 1 in Figure 2 and Section 2.1 of this document). Although the challenges and megatrends are listed separately, they intersect to create specific dynamics that play out in various ways in the different geographies of low- and middle-income countries. This is why a critical element of the ToC is the understanding of and responsiveness to local context and demand (Column 2 in Figure 2). This is done by aligning with national priorities (see Section 2.3), analyzing comparative advantage (Section 3), and forming alliances with local partners – a key step for shaping CGIAR priorities. The assessment of challenges, megatrends, and other prioritization activities requires periodic refreshing to ensure that CGIAR's research is positioned to be as impactful as possible (Section 2.5).

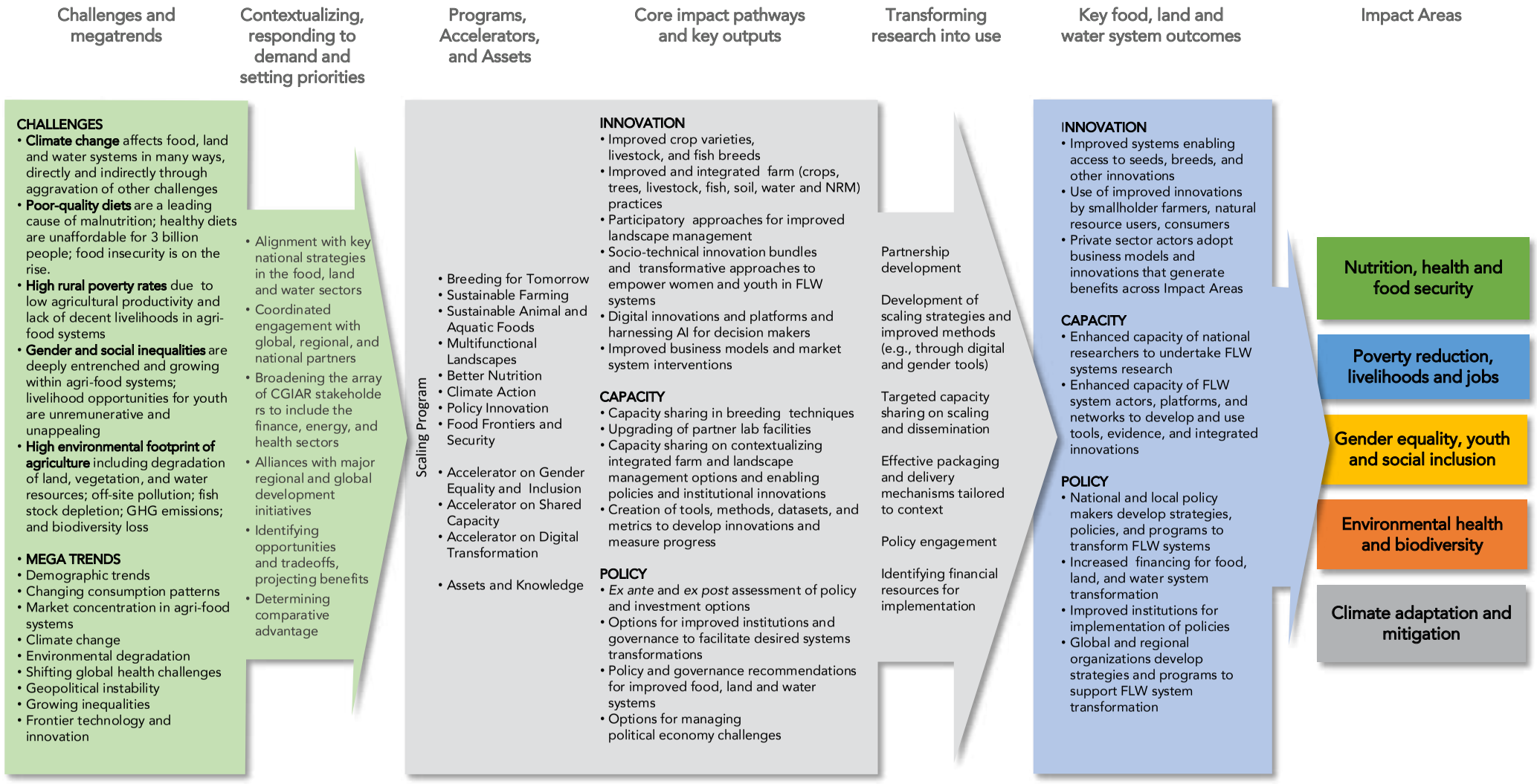
The third column in Figure 2 presents the CGIAR offer of eight Science Programs, one Scaling Program, three Accelerators, and Genebanks and Knowledge.[3]

The outputs generated by all Portfolio components align with the core CGIAR innovation, capacity, and policy impact pathways. They are informed by challenges and megatrends, partner engagement, comparative advantage analysis, and ex ante assessments. Some examples of key CGIAR outputs for each of the three impact pathways are listed in Column 4. Innovations range from crop varieties and field, farm, and landscape management practices to institutional and organizational innovations. Capacity-strengthening outputs are targeted to both organizations and individuals. Policy outputs aim to inform decision makers at different levels and stages of policy processes.

As a research-for-development organization, CGIAR implements actions to promote and facilitate the use of outputs by external organizations. Such actions, outlined in Column 5, include developing scaling strategies, identifying effective dissemination methods, and engaging with policymakers.

3 The long-term strategic Assets and Knowledge required for CGIAR to deliver cutting-edge research underpin and support the entire Portfolio and will be funded separately. Genebanks have been identified as a core component of Assets and Knowledge (see the description of Genebanks in Section II), while other long-term assets (such as other laboratories, experiment stations, and core models) are undergoing assessment in an ongoing study prior to their inclusion in this category.

Figure 2. CGIAR's high-level theory of change, in collaboration with partners



By generating high-quality research, co-creating innovations, and undertaking actions to transform research and innovation into use, CGIAR and its partners increase the likelihood of achieving outcomes. Examples of key high-level outcomes that CGIAR contributed to in recent years are listed in Column 6. These include the use of innovations by various stakeholders in food, land, and water systems; capacity change; and enactment of strategies and policies at different levels. CGIAR's contributions to new business models driven by private-sector agents are also needed to achieve food, land, and water systems transformation. The specific outcomes that CGIAR will contribute to through the 2025–2030 Portfolio will be defined through consultative processes with stakeholders..

Finally, if the outcomes are significant enough and sufficiently integrated in specific geographies to support transformation, the ToC posits that they will contribute to impacts on food, land, and water systems transformation that will be reflected through positive changes in CGIAR Impact Area indicators.

Figure 2 does not include the feedback and learning loops that span the different stages of the ToC and are fundamental to adaptive management. It also does not show the specific roles of partners and stakeholders in shaping CGIAR activities and outputs. It should be emphasized that the CGIAR ToC encompasses its work with partners and reflects consultations with stakeholders.

4.2.2 How the Programs, Accelerators, and Assets collectively deliver on CGIAR's theory of change

Building on the cross-Initiative collaboration efforts in the 2022–2024 Portfolio, the design of the new Portfolio includes intentional and explicit integration of Initiatives (see Table 2), alignment of relevant bilateral projects, as well as cross-Portfolio linkages in support of a clearer and more streamlined offer.

The Portfolio components interact to coherently address key challenges and contribute to outcomes and impact in the following ways:

- All Programs and Accelerators contribute to more than one Impact Area. However, the Programs on Climate Action, Multifunctional Landscape, and Better Nutrition, and the Accelerator on Gender Equality and Inclusion each have a stronger alignment with one Impact Area and serve as anchors to drive cohesion and learning in this Impact Area.
- All Programs and Accelerators pursue more than one of CGIAR's three main impact pathways (innovation, policy, and capacity). Some Programs and Accelerators reinforce good practices and support other Programs and Accelerators on a specific impact pathway. This is the case of the Scaling Program, which serves key functions for the innovation impact pathway by both signaling demand to prioritize research and innovations and by supporting other Programs in testing, adapting, and scaling innovation bundles; the Program on Policy Innovation, which convenes a community of practice in support of the policy pathway, in turn supporting the Program on Scaling for Impact's work to build enabling environments for scaling; and the Accelerator on Shared Capacity, which co-invests in capacity strengthening with Programs.
- Each Program works across scales. In addition, several Programs play an integrative role at key scales. For example, the Program on Sustainable Farming is a focal Program for integrating CGIAR's work at the field and farm levels. The Program on Multifunctional Landscapes plays a pivotal role in understanding the intersection of land (including agriculture, soils, forests, and wetlands), water, and biodiversity with livelihoods, policies, and institutions at the landscape scale. While the Program on Policy Innovation's research spans from global to local, its work on policy responses to meet multiple objectives happens mostly at the national or sub-national levels, where policy/investment decisions are most critical and where global and regional policies are implemented.
- The Program on Scaling for Impact advances the science and practice of scaling. It coordinates efforts to quantify and communicate the demand for research and scaling at country and regional levels to other Programs, helping to iteratively prioritize research. It convenes cross-Program collaborations in an adaptive learning-oriented approach for testing and improving bundles of innovations and helps other Programs develop scaling strategies.
- Accelerators support science and innovation within their topical areas while ensuring that best practice methods and key findings are harvested and used throughout the Portfolio. For example, the Accelerator on Gender Equality and Inclusion conducts strategic research to identify interventions to enhance women's empowerment in food, land, and water systems and support system change toward more equality and inclusion, while also contributing to integration of cutting-edge gender research methods, tools, and evidence into other Programs and Accelerators.
- All Programs and Accelerators address emerging concerns that are not yet high on development agendas. In addition, the Program on Food Frontiers and Security houses research on cross-cutting frontier topics, such as a focus on conflict-prone and other fragile settings where food and water insecurity and poverty are most acute. This Program also focuses on rapidly changing urban environments where food security pressure is increasing with changing demographics. Finally, it will house research on fast-evolving innovations that are shaping how food is produced and distributed.
- the long-term Assets and Knowledge required for CGIAR to deliver cutting-edge research, and which underpin and support the entire Portfolio, will be funded separately. These include genebanks as well as other laboratories (animal research, nutrition, soil, and water), experiment stations, and core models.

The ongoing IAES-commissioned evaluation of Science Groups has identified several constraints to integration in the 2022–2024 Portfolio. First, geographical concentration of research is one of the necessary conditions for improved integration. Second, in countries with concentration of research (e.g., Bangladesh, Ethiopia, India, Kenya...), meaningful integration requires proper investment in time and resources. The new, more consolidated 2025–2030 Portfolio structure positions CGIAR well to take these learnings on board and seize opportunities for better integration.

From a thematic perspective, the boundaries between the various Programs and Accelerators are intentionally not rigid, thus creating space for collaboration and complementarity to be refined in the next phase of their design. For example, some dimensions of livestock and fish breeding are envisaged to be included in the Program on Breeding for Tomorrow and others in the Program on Sustainable Animal and Aquatic Foods. Many other topical areas for collaboration have been identified (see Section II).

Community data collector carries a device to measure soil moisture at different depths. Credit: Mulugeta Ayene / WLE

4.3 Assets and Knowledge

A cross-CGIAR Steering Group is currently overseeing a study of the long-term strategic Assets and Knowledge that underpin CGIAR's science and innovations (long-term field trials, breeding services and operations, long-term data maintenance, and modeling capabilities). This study aims to help understand the full range of these Assets and Knowledge and set out options for their improved management as well as sufficient, predictable, and sustainable financing. It will answer questions such as: Which investments in CGIAR assets are needed and through which mechanisms? Which savings can be achieved through these investments? Which opportunities are there for optimization across Centers? Early findings are expected in May 2024, with more detailed directions to be developed alongside the Portfolio for consideration by the System Council later this year. Owing to the crucial role of genebanks for CGIAR and other organizations across the globe, and to the existing consolidated body of knowledge on their costs and management, this component of Assets and Knowledge has been included in the design of the 2025–2030 Portfolio, with a short description of the Genebanks component provided in Section II of this document and a full design document on Genebanks to be submitted in September.

4.4 Continued strengthening of gender and social inclusion research

Gender and social inclusion research is critical to the success of CGIAR. It is embedded throughout the CGIAR Portfolio and ensures that the solutions developed by CGIAR and partners reach and benefit women and men equitably. In addition, it identifies and addresses root causes of inequalities in agri-food systems and aims to increase women's empowerment and support systems change toward equality and inclusion, thereby contributing to SDG 5 and other SDGs. The 2023 annual CGIAR GENDER Conference organized by the Gender Impact Area Platform highlighted the need to advance the gender research agenda to boost gender-transformative research and provide solutions to gender inequalities, which are exacerbated by the climate change crisis and other shocks and stressors. Meeting these objectives requires continued attention to increasing investment in the scope and quality of gender research. Building on the work of the GENDER Platform, the Accelerator on Gender Equality and Inclusion will implement its own agenda-setting research for CGIAR and work with the Programs to create a coherent and relevant gender and social inclusion research portfolio. Areas of focus involve identifying and filling evidence gaps, guiding CGIAR and partners' research agendas, integrating lessons, and tracking results from gender research across CGIAR. Each Program will include gender and social inclusion research capabilities.

5. Operationalizing the new Portfolio

5.1 Research delivery: Balancing continuity and change

The Initiatives have established solid research and implementation partnerships globally and in target countries and are on track to deliver results against 2022–2024 plans (444 outcomes reported in 2022–2023). Avoiding disruption of successful research and scaling is therefore a key objective. A large proportion of the research, partnerships, capacity strengthening, and outreach work of the Initiatives and Impact Area Platforms will continue into the 2025–2030 Portfolio and be housed under the appropriate Programs and Accelerators. As part of the prioritization process taking into account the demand expressed by stakeholders in Listening Sessions and other fora, selected areas of work will be strengthened while others will be dialed back and new areas will be added. This prioritization process will also result in the selection of key geographies during the preparation of the full design documents. Information on key and emerging areas of work and how each Program and Accelerator builds on lessons learned can be found in the individual Program and Accelerator descriptions in Section II of this document.

5.2 Toward greater transparency, complementarity, and accountability across all sources of funding

The 2025–2030 Portfolio is designed to encompass all sources and types of funding toward CGIAR research and innovations: CGIAR Trust Fund Window 1 (pooled) as well as Window 3 and bilateral funding (bilateral). The Programs and Accelerators will be funded through combinations of pooled and bilateral funding, with each type governed and managed in accordance with applicable rules and consistent with the CGIAR Integration Framework Agreement and the CGIAR memorandum on the implementation of governance recommendations. Program/Accelerator and Center management will coordinate alignment and connections between pooled and bilateral funding in complementary, synergistic ways to drive impactful research and innovation.

Subject to further review of and amendments to CGIAR's pooled funding modalities building on the work of the Financial Model Reference Group, the Portfolio is being designed on the understanding that pooled funding will be (i) deployed in accordance with a multi-year financing plan and annual budgets approved by the CGIAR System Council, consistent with the six-year design and impact ambition of the Portfolio; (ii) provided toward the full Portfolio or earmarked for individual Programs or Accelerators; and (iii) managed in full compliance with all relevant CGIAR agreements and rules as well as CGIAR's performance and results management approach and Technical Reporting Arrangement. In addition, it is anticipated that pooled funding will primarily be deployed toward foundational and catalytic research and innovation that fosters cohesion across the Portfolio and CGIAR Centers and that helps unlock additional complementary bilateral funding.

Bilateral funding will continue to be raised, approved, and managed at the Center level, in accordance with applicable Center rules. It will be deployed over various time frames and will target various geographies and thematic areas as agreed between funders and Centers. To enable complementarity and synergies across funding sources while keeping administrative burdens within reasonable bounds, a minimum level of reporting into the performance and results management framework will be established for bilaterally funded projects.

Lessons from past CGIAR research modalities will be applied to ensure transparency and accountability in the use of pooled funding and associated reporting. Pooled funding will be allocated to clearly defined components within the Programs and Accelerators, with clarity on accountability and the results that such funding contributes to. A joined-up performance and results management approach that includes both pooled and bilateral funds will enable joint reporting across all work aligned with each Program/Accelerator, including both pooled and bilateral funding, showing how each funding stream contributes to shared results and helping guard against any double counting.

Programs and Accelerators will develop detailed MELIA plans during the last quarter of 2024 and first quarter of 2025. These plans will include the collection of evidence for planned outcomes across areas of work and geographies, as well as rigorous studies to measure impacts in selected cases.

5.3 A collaborative management structure

Drawing lessons from past cycles of CGIAR research, the 2025–2030 Portfolio will be managed through a collaborative arrangement that brings together and draws on the best capabilities from across Centers and partners. As the details of these arrangements remain under development, this section provides only preliminary thinking at this stage.

Each Program and Accelerator will work closely with partners and bring together several Centers in a cross-Center structure that drives effective sharing of data and information, coordination, collaboration, and alignment toward intended research outputs, outcomes, and impacts. The Programs and Accelerators will be based on shared ownership and responsibility across all Centers involved.

A CGIAR Chief Scientist reporting to the Executive Managing Director will oversee the Portfolio, working in close collaboration with all Centers. For each Program and Accelerator, a leader or coordinator reporting to the Chief Scientist will drive strong collaboration and coordination on behalf of all partners involved. The Chief Scientist and Program/Accelerator leaders or coordinators will be appointed through open, transparent, and competitive processes and in accordance with CGIAR's targets for gender, diversity, and inclusion.

Beyond formal roles and accountabilities, the Programs and Accelerators will convene thematic communities of practice, representing CGIAR in their respective topical areas, enabling shared learning and knowledge management, and fostering a shared culture.

In addition to science and innovation leadership and management, successful implementation of the new Portfolio will rely on a wide range of effective and efficient enabling, convening, and facilitating functions, including but not limited to partner and stakeholder engagement at the country, regional, and global levels; business operations; communications; digital and data; finance; legal; people and culture; resource mobilization; and risk management. The organization of these functions is under review as part of the implementation of CGIAR's new integrated governance arrangements, through the "integrate, coordinate, independent" (ICI) process aiming to determine which functions should be integrated or coordinated across the partnership and which functions should be handled independently by each Center.

The evolution toward a more collaborative, coherent, and efficient management model will be monitored over time to ensure timely adjustments as needed.

5.4 The transition to 2025: Identifying, mitigating, and managing risks

With the exception of final reporting and closeout activities, the Initiatives and Impact Area Platforms will be closed on 31 December 2024 and the research to be continued will be integrated into the Programs and Accelerators. To ensure a smooth transition to the new Portfolio and building on lessons from the 2021–2022 transition, a team is working on crafting guidance on the various aspects of the transition (people management, finance, partnerships, planning and reporting, communications and outreach, etc.).

Measures are being developed to mitigate the key risks associated with the Portfolio design process and the transition to that Portfolio (Table 3).

Table 3. Preliminary key risks and mitigation measures

Key risks	Mitigation measures (preliminary, not exhaustive)
• Loss of continuity of science progress and research delivery, lack of recognition of previous relevant work	• A carefully managed phased transition from the current 2022–2024 Portfolio of Initiatives and Impact Area Platforms to the new 2025–2030 Portfolio of Programs and Accelerators, with a view to ensuring strong continuity of science, partnerships, and funding. • An inception phase through Q1 2025 will be used to set up Program and Accelerator management processes and finalize partnership arrangements. Similarly, adequate time and resources will be set aside to allow for an orderly closeout of and final reporting on the Initiatives and Impact Area Platforms in early 2025. • Appropriate, pragmatic modalities will be put in place to ensure that staff time can be covered through the Programs and Accelerators from 1 January 2025.
• Loss of continuity in partnerships	• In addition to the above, close engagement and co-design with key existing partners in the design process.
• Increased competition, decreased collaboration between Centers	• Collaborative arrangements for the design of the new Portfolio (inclusive writing teams and close engagement with leadership across CGIAR) and future management of Programs and Accelerators.
• Financial instability	• As part of the transition mentioned above, proactive engagement with funders with a view to ensuring continuity of funding from the current Initiatives and Impact Area Platforms to the Programs and Accelerators.
• Lack of external trust and credibility	• A Portfolio design process and research and innovation delivery model that is aligned with and delivers on CGIAR's commitments, standards for the quality of research for development, and partner engagement principles. • Regular and tailored communications with partners and stakeholders as well as transparent high-quality reporting on the design and implementation of the new Portfolio. • Follow-up with stakeholders on responses to the recommendations made during the Listening Sessions.
• Lack of internal trust and credibility, internal fatigue	• Frequent, targeted, and tailored communications and engagement with staff on the rationale for the Portfolio design process, its implications for staff (work, roles, teams), and how staff can engage and contribute. • Mechanisms in place for regular feedback (e.g., staff engagement surveys).

6. Next steps

The next steps for the Portfolio development are outlined in Table 4.

Table 4. Next steps for Portfolio development

Time frame	Step
8 May	Portfolio narrative submitted for ISDC review
22 May	Portfolio narrative and ISDC review submitted to the System Board
29 May	Portfolio narrative, ISDC review, and System Board recommendation submitted to the System Council
End of May	Finalization of Program and Accelerator design document templates
End of May	Identification of outputs of the December 2024-March 2025 inception phase
End of May	Outputs of study on CGIAR Global Assets available
12-13 June	20th Meeting of the CGIAR System Council (SC20): decision and guidance on the Portfolio narrative
1-5 July	CGIAR Science Week: partner dialogues featuring each Program and Accelerator
Week of 22 July	System Council touchpoint: update on progress from SC20 and on how the writing teams are addressing feedback and guidance received from ISDC, the System Board, and the System Council
12 September	Deadline for writing teams to submit the full Program and Accelerator design documents for internal review and clearance
27 September	Full Program and Accelerator design documents submitted for ISDC-moderated external independent review
1 November	Updated Portfolio narrative submitted for ISDC review
15 November	Full Program and Accelerator design documents and ISDC reviews submitted to the System Board for approval
27 November	Full Program and Accelerator design documents, ISDC reviews, and System Board approval submitted to the System Council
Week of 9 December	21st Meeting of the CGIAR System Council (SC21): final decision moment for Programs and Accelerators

Collecting Medicago seed in regeneration plots of ICARDA Terbol.
Credit: Michael Major / Crop Trust

Enhancing productivity and resilience through genetic innovation: Science Program on Breeding for Tomorrow

Mega challenges and opportunities

The Science Program on Breeding for Tomorrow will aim to address the mega challenges of food insecurity, malnutrition, poverty, and social inequalities in low- and middle-income countries that are fueled by demographic shifts, climate change, environmental degradation, market concentration, and growing inequalities. It will aim to develop and deliver climate-resilient, market-preferred, healthy, and nutritious varieties and breeds[4] and to make food production systems more productive, sustainable, and future ready. By emphasizing gender-intentional, system approaches, the Program on Breeding for Tomorrow will foster market competition, innovation, and productivity and efficiency gains to deliver higher genetic gain that has the greatest potential to address CGIAR's Impact Areas and megatrend challenges. In partnership with public, private, and civil society collaborators, the Program on Breeding for Tomorrow will develop and deploy modern technologies to improve the quality of life of women and men who are small-scale farmers in low- and middle-income countries.

Contribution to CGIAR's impact

The Program on Breeding for Tomorrow will contribute to CGIAR's Impact Areas through improved genetics, policy influences, and capacity sharing with partners. Development and delivery of well-adapted varieties/breeds will be achieved through complementary actions, including the following:

- Gathering forward-looking market intelligence for breeding to deliver in-demand, targeted varieties/breeds that align with national priorities, including the needs of women, men, and youth farmers, and consumers and other value chain actors.
- Consistently supporting CGIAR-NARES-SME networks and breeding pipelines through essential breeding services, capacity sharing, and operational support to facilitate access to and uptake of enabling tools and technologies.
- Scaling access to cutting-edge breeding methods, organizational frameworks, and performance monitoring systems to right-size breeding investments based on priorities and opportunities for impact at scale.
- Improving the availability of high-value genetic variation for breeding by leveraging appropriate trait discovery and deployment approaches, novel germplasm from CGIAR genebanks and other public collections/programs, and precision genetics technologies and novel phenotyping methods.
- Improving seed systems through public-private-farmer partnerships to increase delivery of new varieties/breeds, in addition to monitoring their uptake and impact.

Scope of work

Key areas of work will include the following:

- Market analysis to define product concepts and prioritization of breeding pipelines; breeding strategies to translate product concepts into feasible, impactful, and in-demand target product profiles with clear value propositions.
- Managing CGIAR-NARES-SME network breeding pipelines through the division of labor based on the partners' comparative strengths and capacity.
- Enhanced breeding designs with novel and innovative genomics, and phenotyping for higher and sustained genetic gain and discovery and deployment of native traits in elite germplasm.
- Precision genetics to deliver desired variations for breeding.
- Novel technologies to enhance the uniformity, health, propagation efficiency, and scale of seed production.
- Capacity sharing and building strategies to strengthen national and regional breeding and scaling capabilities.
- Data management processes and systems to improve decision making.
- Applications of the science of scaling, organizational behavior, gender, and participatory research to co-create new products and services.
- Policy research with socioeconomic and regulatory analysis to foster genetic innovation enabling environments and adoption of new varieties/breeds.
- Causal impact evaluation to attribute CGIAR investments in genetic innovation to outcomes across the five Impact Areas.

The Program on Breeding for Tomorrow will take advantage of the many opportunities emerging from nascent applications of transdisciplinary approaches within genetic innovations and scientific advances, including the following:

- Global crop breeding programs that effectively leverage CGIAR's global science capabilities and capacity for local product development in partnership with NARES and SME breeding networks.
- Enhanced approaches to collect market intelligence from stakeholders.
- Wider application of current and new genomic selection techniques, novel phenotyping and speed breeding methods, and predictive breeding and AI tools to improve and accelerate genetic gain.
- More precise and faster trait discovery and deployment opportunities for leveraging climate and genetic foresight along with new tools and capacity for genome editing.
- System-wide application of digital tools in varietal/breed development, adoption, and quality management.
- New and collaborative strategies to deliver higher genetic gains on farms, integrating context-specific scaling models.

4 The term "variety and breeds" refers to varieties of food, feed, and forage crops; trees and other perennial species; breeds of livestock and poultry; strains of fish and other aquatic species; and their distinguishing genotypic and phenotypic characteristics. The term "seed" describes dissemination materials for these varieties and breeds.

CGIAR pooled/funded work and bilateral projects will continue, including public-private partnerships and collaboration with non-CGIAR advanced research institutions for upstream discovery research aligned with genetic innovation. The efforts of the Market Intelligence Initiative on market segmentation will be enhanced to continue informing and improving investment decisions on genetic innovation. The modernization of breeding programs will build on the extensive work of the Accelerated Breeding Initiative in optimizing breeding programs' organization, design, analytics, data quality control, monitoring, and partnerships, thus further strengthening CGIAR-NARES-SME breeding networks' effective and efficient product development and deployment efforts. Access to enabling tools and services, developed through the Breeding Resources Initiative, will be extended to additional crops, trees, forages, livestock, poultry, and aquatic species, thus leveraging improved efficiencies for all. Access to precision genetic tools and capacities will be leveraged from the Gene Editing Initiative. Variety catalogues, digital variety adoption tracking tools, and policy/regulatory analyses conducted by the Seed Equal Initiative will be strengthened and expanded to link product development with delivery and generate evidence on adoption patterns and trends.

Aligning with partner needs and demands

The Program on Breeding for Tomorrow's work will build on partners' regional and national breeding targets and the principles for collaborative work developed in the 2022 and 2023 NARES and sub-regional bodies' consultation meetings. This will encompass CGIAR-NARES-SME breeding networks' feedback as well as feedback coming from CGIAR Listening Sessions and other country-level consultations. CGIAR-NARES-SME breeding and scaling networks will continue working closely with regulatory agencies, seed system partners, and allies in the public, private, and civil society sectors to accelerate the co-development and adoption of market-demanded superior varieties and breeds.

Linkages with the wider CGIAR Portfolio

The Program on Breeding for Tomorrow will work with

- **The Program on Climate Action** on innovation packaging and local adaptation of varieties and breeds for better performance under climate change.
- **The Program on Policy Innovation** on foresight and how megatrends can inform market intelligence.
- **The Programs on Better Nutrition and on Sustainable Animal and Aquatic Foods** to inform prioritization of breeding pipelines, identify traits of breeding relevance, and further mainstream CGIAR work on genetic biofortification.
- **The Program on Sustainable Farming** to implement a common targeting framework; develop innovation packages of resilient, adapted, and productive varieties and breeds co-optimized with integrated farming management practices; and to ensure that plant health monitoring and integrated pest management systems are well aligned and inform breeding.
- **The Program on Food Frontiers and Security** to identify and deliver quick-to-scale innovations and inform breeding pipeline prioritization.
- **The Program on Scaling for Impact** to ensure that a partnership-driven, scientifically grounded approach is pursued in the design and implementation of innovation packages and scaling models to deliver genetic gain on-farm.
- **The Accelerator on Gender Equality and Inclusion** to advance gender-responsive and gender-transformative product design and development.
- **The Accelerator on Digital Transformation** to streamline data architecture and improve access to, and integration of, enabling digital tools and technologies.
- **The Accelerator on Shared Capacity** for novel approaches to organizational learning, change, and continuous improvement.
- **Long-Term Assets and Knowledge**, including necessary breeding infrastructure and capabilities and **Genebanks**, which serve as a source of desired, needed novel genetic variability for traits of interest.

Realizing productivity, resilience, and sustainability at scale through integrated agronomy, plant health, and farming system solutions: Science Program on Sustainable Farming

Mega challenges and opportunities

The Program on Sustainable Farming will address the interconnected challenges of (1) increasing food and nutrition security, income, and employment generation, and decreasing poverty for a **growing population** through options for sustainably intensifying and diversifying farming systems; (2) **climate change** through integrated farm management and community adaptation and mitigation options; and (3) **environmental degradation and biodiversity loss** through resource-efficient and environmentally sustainable farming system solutions. These challenges are present in all regions where CGIAR operates but are especially prominent in Africa and Asia. Furthermore, the Program on Sustainable Farming will leverage **frontier technologies**, particularly digital tools and human-centered design approaches. **Prioritization of farming systems and geographies** will consider (1) the need to generate the greatest returns on investment in relation to the mega challenges, (2) responsiveness to demand, and (3) the presence of an enabling environment for scaling and impact, with a focus on **decreasing gender and youth inequalities.**

Contribution to CGIAR's impact

The deployment and adoption of integrated agronomic, plant health, soil and water management, and farming system solutions at scale is critical to deliver on the **CGIAR Impact Areas and Results Framework targets** through (1) increasing income, improving livelihoods, and creating jobs; (2) increasing climate resilience and enhancing yield stability while decreasing the environmental footprint; (3) increasing environmental health and protecting biodiversity by decreasing agricultural land expansion and pollution; (4) decreasing hunger and improving nutrition, health, and food security by intensifying and diversifying farming systems; and (5) decreasing gender and social inequalities through responsive solutions that decrease gender productivity gaps. The Program on Sustainable Farming will realize **productive, profitable, resilient, and sustainable farming systems** considering crops, trees, and livestock. This will include the delivery of **agronomic gain at scale**, conceptualized as profitable and high-quality yield increases; more stable yields, adapted to climate change; enhanced nutrient- and water-use efficiencies; improved soil health; and decreased losses caused by pests, diseases, and weeds.

The main **pathways to accelerate impact** consist of (1) engagement with public and private research and scaling partners to strengthen their capacities for co-developing demand-driven, context-specific solutions; (2) setting up partnership platforms with participation of service providers and other stakeholders to bundle solutions toward common goals; and (3) evidence-based technical assistance to public- and private-sector investments toward productive, sustainable, and resilient farming systems.

Scope of work

The Program on Sustainable Farming will strengthen systems approaches to deliver integrated solutions, building on Centers' and partners' comparative advantages and on progress made by the Excellence in Agronomy, Plant Health, and Mixed Farming Systems Initiatives and relevant Centers' bilateral projects. In addition, it will integrate some of the functions of the Impact Area Platform on Environmental Health and Biodiversity, alongside the Program on Multifunctional Landscapes. Key implementation principles involve the recognition that solutions need to be contextualized and help to decrease gender productivity gaps, respond to farmer heterogeneity, integrate risk assessments, and align with farmer and stakeholder demands.

Key areas of work include the following:

- **Climate adaptation and mitigation of farming systems**, focusing on solutions that enhance yield stability, decrease environmental footprints, and improve system diversification, combining annual and perennial crops, forages, livestock, and trees, as appropriate.
- **Precision soil nutrient management**, deployed through the principles underlying integrated soil fertility management.
- **Resilient soil systems** that decrease or reverse soil degradation.
- **Healthy and mycotoxin-free crops**, achieved by improved diagnostics, surveillance, risk assessment, early warning systems, and integrated management of existing or emerging pests, diseases, and weeds.
- **Integrated field and farm-scale water management**, including irrigation, water harvesting, water conservation solutions, and soil and water management in rainfed farming.
- **Scale-appropriate mechanization**, with a focus on decreasing drudgery, especially for women, and creating job prospects for young people.
- **Co-creation and participatory approaches** for bundling and scaling innovations.

Emerging areas of work will be prioritized based on gaps identified with partners and could include: integration of neglected and underutilized crops and nutrient-dense foods and feeds, integration of bio-circular economy principles, understanding of soil microbiomes to enhance system resilience, and deeper evidence on the effects of integrated farming solutions on women and young people.

The Program on Sustainable Farming will **create efficiencies** in the research-to-scaling pipeline by aligning pooled and bilaterally funded activities, sharing expertise and assets among CGIAR Centers and with advanced research organizations and national partners, providing science-based content about innovations of interest to scaling partnerships, and co-locating and co-investing in activities within and across relevant Programs. **Research methods** will embrace agility and innovation across the solution development and validation workflow and will integrate, among others, long-term trial data, farming system analysis and characterization, spatio-temporal modeling, big data science, standardized and FAIR data processes, remote sensing, artificial intelligence, decision support logic, human-centered design approaches, and relevant socioeconomic and gender-related methodologies.

Aligning with partners' needs and demand

The design of this Program draws on insights from the 2024 CGIAR Listening Sessions and consultations carried out by Initiatives. CGIAR Listening Sessions revealed that sustainable agriculture is a clear priority for CGIAR stakeholders. Integrated farming system solutions and enhanced soil and water management were demanded in more than two-thirds of the cases, while climate-smart agriculture, including diversification, plant health, and food safety challenges, were mentioned in at least half. The Program's key areas of work are informed by previous consultations. From 2022 to 2023, the Excellence in Agronomy Initiative engaged with more than 288 science and delivery partners from over 18 countries to prioritize climate adaptation and sustainable intensification interventions. The Plant Health Initiative conducted a diagnosis of capability gaps in surveillance and monitoring of priority pests and diseases among national partners in 26 countries. The Mixed Farming Systems Initiative established 245 partnerships with public and private stakeholders in six countries to prioritize farming system innovations. Feedback from stakeholders on an earlier version of the new Portfolio in 2023 enhanced the focus on systematically engaging with national partners, investing in capacity building and well-defined research for development support, and focusing on CGIAR's comparative advantages.

Linkages with the wider CGIAR Portfolio

The Program on Sustainable Farming will build on lessons learned during the implementation of the 2022–2024 CGIAR Portfolio and facilitate cooperation through **co-financed, co-implemented, and co-located activities** with (1) the Program on Scaling for Impact to respond to priority demands from partners, countries, and regions, thus accelerating the scaling of innovations; (2) the Program on Breeding for Tomorrow on appropriate crop and farm management options that will be essential for new crop varieties to realize their genetic gains; (3) the Program on Climate Action to provide solutions contributing to climate change adaptation and mitigation; (4) the Program on Multifunctional Landscapes, as sustainable crop and farm management is essential for regenerative landscapes; and (5) the Program on Policy Innovation on the institutional innovations and policy support required for integrated farming solutions. The Program on Sustainable Farming will **share solutions and information** with the Program on Better Nutrition since farming systems' diversification, including biofortified, mycotoxin-free, and pesticide-safe crops, will contribute to more nutritional and healthier diets; and with the Program on Sustainable Animal and Aquatic Foods, which will provide innovations to be incorporated into mixed farming systems approaches. Approaches and methods from the three Accelerators **will be integrated** in the Program on Sustainable Farming to improve research, scaling, and impact.

A woman holds mola caught from her pond in Jessore, Bangladesh.
Credit: M. Yousuf Tushar / WorldFish

Animal and aquatic food systems for nutrition and health: Science Program on Sustainable Animal and Aquatic Foods

Mega challenges and opportunities

The Program on Sustainable Animal and Aquatic Foods will address key global challenges related to food and nutrition security, human health, livelihood improvement and poverty reduction, environmental sustainability, and resilience to climate change. Animal and aquatic food production systems are vital to the nutrition and livelihoods of millions of vulnerable communities in low- and middle-income countries, provide a buffer to climatic and socioeconomic shocks, and are socially inclusive. Nearly two-thirds of livestock producers are women, while nearly half of the workers in fisheries and aquaculture are women.

Despite the growing demand for aquatic foods, milk, meat, and eggs in low- and middle-income countries, livestock and aquatic food systems face many challenges. These systems often fail to capitalize on technological innovations in breeding and sustainable production and are still contributors of greenhouse gas emissions. The degradation of terrestrial and aquatic ecosystems increases the spread of disease and antimicrobial resistance, highlighting the need for integrated approaches. Poor governance of commons marginalizes traditional pastoralists and fishers. Inadequate infrastructure and limited market access hamper the efficient distribution of animal and aquatic inputs, and lead to poorly functioning output markets, affecting both producers and consumers. Moreover, the lack of comprehensive data constrains the ability of stakeholders to make informed policy and investment decisions.

Unlocking the many benefits of these systems is crucial. Enhancing integration between sectors, our mission is to increase the productivity and strengthen the resilience and feed conversion efficiency of animal and aquatic food systems, with a special focus on supporting socially, economically, and environmentally sustainable low-emission, nutrient-dense, and healthy food supply chains in low- and middle-income countries.

Contribution to CGIAR's impact

The Program on Sustainable Animal and Aquatic Foods will contribute to all five CGIAR Impact Areas and directly to nine of the eleven collective targets. To achieve this, it focuses on three impact pathways: Developing integrated solutions to improve key production systems through genetics and breeding, feed management and health services; strengthening market systems in selected countries in Africa, Asia, Latin America and Pacifics through multi-stakeholder approaches; and addressing institutional and governance gaps and unlocking investments to fuel livestock and aquatic food sectors. The Program on Sustainable Animal and Aquatic Foods will harness advancements in AI, machine learning, and other digital technologies to enhance agricultural productivity and sustainability by refining breeding and selection programs through predictive genetic analytics, improving disease management with early detection systems, and optimizing feed formulas using real-time data analysis.

The Program on Sustainable Animal and Aquatic Foods's approach will emphasize the co-creation of integrated bundled technical and institutional innovations to support farmers' uptake of the needed inputs and result in higher productivity. This includes working on innovations at the production level, improving access to safe and nutritious foods through more equitable markets, and addressing policy and institutional gaps.

Scope of work

The Program on Sustainable Animal and Aquatic Foods' key areas of work will involve the following:

- **Productivity plus:** The outcome of this area of work will be improving productivity and sustainability of animal and aquatic food systems benefiting millions of livestock keepers and fishers by co-developing and deploying at scale climate-smart livestock and aquatic systems innovation packages that increase productivity while also reducing GHG emissions. Through integrated research on genetics, genomics, animal health, feeds, forage, and husbandry, these innovations will be packaged to build resilience to climate challenges and address land and water degradation in the context of animal and aquatic food production and use. This builds upon the innovative work of the Sustainable Animal Productivity (SAPLING) Initiative on integrated genetic, feed, and health strategies; on the Livestock and Climate Initiative on climate-smart forages, digital services, investments, and policy; and on the Aquatic Food Initiative (AqFI) on fish genetics and trait preferences.
- **Resilient and low-emission production systems:** The outcome of this area of work is to increase the resilience of livestock and aquatic systems. The Program on Sustainable Animal and Aquatic Foods will undertake system analysis and modeling that integrate livestock and aquaculture within the larger ecosystems that they are part of to optimize productivity and exploit synergies and s for efficient resource use. It will co-develop and scale climate-smart technologies to diminish feed/food waste and loss. The Program on Sustainable Animal and Aquatic Foods will highlight the sustainable use of animal and aquatic biodiversity. In addition to bilateral projects. This work will build on the Sustainable Animal Productivity, Livestock and Climate, and Aquatic Food Initiatives.
- **One Health approach:** The outcome of this area of work will be to address health risks across humans, animals and fish, and ecosystems, including wildlife and wild fish. This will be achieved through transdisciplinary research to enhance the understanding and management of disease in livestock and aquatic animals and in people, and develop tools for disease diagnosis, surveillance, and response. This will include risk-based approaches to enhance food safety, tackle anti-microbial resistance, and address emerging infectious and zoonotic diseases with an economic and behavior change perspective to decrease health risks in the market systems. This work builds upon the One Health and Resilient Cities Initiatives and multiple bilateral projects.
- **Market systems:** The outcome of this area of work is that systemic challenges within market systems are addressed, and access to animal and aquatic foods is enhanced. This research will use multi-stakeholder approaches such as innovation platforms to move beyond analysis into action. The Program on Sustainable Animal and Aquatic Foods will analyze drivers and inhibitors for sustainable, equitable, and inclusive access to and intake of animal and aquatic-sourced foods. Other work will include modeling market systems for greater efficiency, inclusiveness, and competitiveness through digitalization and innovative financing mechanisms. In addition to bilateral projects, this work will build on the Sustainable Animal Productivity, Livestock and Climate, and Aquatic Food Initiatives.
- **Policies and governance:** The outcome of this area of work will be the use of scientific evidence in coherent policy formulation nationally, regionally, and globally as well as more inclusive governance for resilient and low-emission animal and aquatic food systems and their associated land and water systems. The Program on Sustainable Animal and AquaticFoods will provide scientific evidence and data to inform policies and investments regarding livestock, aquatic foods, and climate-related issues nationally and internationally. Multi-stakeholder engagement and advocacy will ensure uptake. This work will build on the Aquatic Food Initiative, livestock master plans, and existing advocacy by Centers and bilateral projects.
- **Gender and social inclusion:** The outcome of this area of work will be closing the gender gap and generating new income and employment opportunities for youth in animal and aquatic production systems. All research areas will integrate gender-transformative approaches to ensure that the needs and aspirations of both women and youth are addressed.

Aligning with partners' needs and demand

Addressing food and nutrition insecurity and creating jobs are priorities for most governments in low- and middle-income countries, as reflected in countries' development strategies and expressed during the CGIAR Listening Sessions. Key partners include but are not limited to governments, NARES, the private sector, development organizations, farmers, fishers, financial institutions, and consumers. As requested by country representatives during the Listening Sessions, the Program on Sustainable Animal and Aquatic Foods will take an explicit co-design approach by identifying value chains in specific countries, diverse production systems, and working in a multi-stakeholder approach.

Linkages with the wider CGIAR Portfolio

The Program on Sustainable Animal and Aquatic Foods will work with almost all Programs and Accelerators. Some initial priority areas of collaboration are with the following:

- The Program on Climate Action through genetics, health, and feeds for lowering GHG emissions and adapting through the application of climate-smart practices.
- The Program on Multifunctional Landscapes via integration of nature-positive and low-emission livestock production system advances in appropriate landscapes.
- The Program on Policy Innovation by collaborating to develop policies that promote sustainable animal and aquatic food systems.
- The Program on Better Nutrition, working on food safety assessments and consumption of animal-source foods.
- The Program on Breeding for Tomorrow to apply more blue-sky research for genetics and breeding, for example, using surrogate sire technology in smallholder systems for rapid distribution of improved genetics.
- The Program on Sustainable Farming to improve productivity of mixed farming systems' crop products and by-products.

Multifunctional landscapes for sustainable food systems, people, and environment: Science Program on Multifunctional Landscapes

Mega challenges and opportunities

Tropical and subtropical landscapes and their linked food/production systems must be sustainably managed to best tackle environmental degradation, biodiversity loss, growing inequality, demographic shifts, climate change, unhealthy consumption patterns, and a digital revolution gap, especially in low- and middle-income countries (see ISDC study on Megatrends), and address any associated nested problems at scale. Land-use change and intensified agriculture have transformed complex natural ecosystems into simplified managed ecosystems, triggering significant biodiversity erosion, with adverse effects on resilience and poor communities. Food systems are responsible for a third of global GHG emissions, are a primary driver of global biodiversity loss, and are a root cause of widespread soil and water degradation. The health and environmental externalities generated by food systems amount to hidden costs surpassing USD 13 trillion annually. Global hunger affected more than 700 million people in 2022, with more than three billion unable to access a healthy diet. Coordinated system- and landscape-level efforts must rebalance the current incompatibilities between food security and nutrition needs on the one hand and the provision of ecosystem services on the other hand.

To steer agri-food systems' trajectories toward sustainable solutions for both people and the planet, the Program on Multifunctional Landscapes offers a global science platform for integrating holistic, science- and evidence-based, and contextualized approaches such as agroecology, nature-positive solutions, and regenerative agriculture to generate urgently needed landscape outcomes and impacts using transdisciplinary approaches across contexts and scales.

The Program has three interconnected objectives (each linked to one impact pathway), which will be pursued in an integrated way at the landscape level: **(1) conserving and enhancing ecosystems and (agro)biodiversity** using **nature-based solutions** to support decent sustainable livelihoods, agriculture, and aquaculture; **(2) restoring and regenerating degraded land, water, and agroecosystems** for sustainable livelihoods, enhanced ecosystem services, and climate change adaptation and mitigation; and **(3) developing agroecology-based agri-food systems**, for sustainable and equitable agriculture linking sustainable production with responsible consumption, equitably positioning diverse small-scale farmers in market systems, and securing regeneration of the underlying natural resource base.

Contribution to CGIAR's impact

The Program on Multifunctional Landscapes Program will help deliver **sustainable, healthy, and equitable landscapes** through **agroecology, nature-positive and regenerative agriculture** approaches at the landscape level to support **decent and resilient livelihoods** for all, especially for marginalized communities, local vulnerable populations, and youth; **secure safe and nutritious foods;** and **generate biodiversity and ecosystem service** gains.

This Program will operate through **three interconnected impact pathways: ecosystem protection, restoration and regeneration, and agroecology-based agri-food systems**, which together deliver agri-food system and landscape management and governance practices to promote nature and social equity at the landscape level. Together, these pathways will contribute to achieving the **high-level outcome**: landscape inhabitants; food, market, and policy systems actors; and development agents use systems-oriented approaches such as nature-positive, agroecology, and regenerative approaches to co-create equitable solutions based on scientific evidence, while generating evidence on how to enable transition pathways toward landscapes that are productive, sustainable, equitable, antifragile, and nutrition- and food-secure. These solutions offer new opportunities, improved ecosystem services, and sufficient, nutritious, and safe food that meet locally prioritized needs, with a focus on addressing the needs of vulnerable groups[2] most susceptible to climate change and other shocks.

Scope of work

The Program on Multifunctional Landscapes builds on ongoing work and partnerships, mostly from the Nature-Positive Solutions and Agroecology Initiatives and components of the Livestock and Climate and Mixed Farming Systems Initiatives. Alongside these, it integrates some of the functions of the Impact Area Platform on Environmental Health and Biodiversity, alongside the Program on Sustainable Farming. It also builds on the bilateral portfolio of Centers in the topics associated with agroecology; agrobiodiversity use; integrated productive systems across crops, fisheries, aquaculture, and

Freshly harvested cassava in Mkuranga district, Tanzania.
Credit: H.Holmes / RTB

livestock; soil, water, and landscape management; agroforestry; social inclusion; and behavior change, among others. It embraces an integrated landscape and food- and water systems approach, with **seven areas of work:**

- **Participatory approaches to co-create, manage, and disseminate knowledge and innovations at the landscape level** to ensure inclusive ecosystem and agroecosystem conservation, restoration, and agroecological transitions.
- **Nature-based, regenerative, and agroecological solutions** for restoration, conservation, and sustainable agriculture. This will include leveraging agro- and soil biodiversity, deploying underutilized species, integrating optimal and cost-effective circular solutions, improving water quality and environmental flows, and optimizing carbon sequestration within integrated landscape management.
- **Nutrition-sensitive and gender-responsive** approaches at the farm and landscape level to identify innovations able to generate a diversity of nutritious foods from natural and agricultural systems, including neglected and underutilized crops, and wild species.
- **Linking market systems, entrepreneurship, and bioeconomy** to unlock components of market systems that can incentivize sustainable practices and unveil entrepreneurship and inclusive green business models to generate adequate job and income opportunities, simultaneously fostering conservation, restoration, and agroecological transitions at scale. This includes developing and strengthening farmer-led seed systems as a way to enhance access to relevant planting material for crops and tree species.
- **Coordinated multi-level policy options co-developed with governments, behavior-change incentive systems for the youth (importantly, young women), and enabling institutions** for nature-positive solutions, agroecology, and integrated landscape-level approaches that incentivize synergies between agroecology-based agriculture, restoration activities, and nature conservation.
- **Integrated multi-scale landscape planning and inclusive governance** models adapted to socio-ecological and land-tenure contexts and that optimize land and water use while protecting the environment, biodiversity, and cultural heritage, and advancing gender equality and inclusion.
- **Holistic assessment and learning frameworks assisted by new data science technologies and citizen science approaches** to continue building data and evidence about the effects of nature-positive solutions, agroecology, and regenerative agriculture on CGIAR Impact Areas, and their trade-offs.

This Program aims to serve as a robust science platform that integrates systemic approaches for both people and nature. This includes promoting agroecology, nature-positive solutions, and regenerative agriculture, among other innovative approaches. The Program will help to develop common frameworks to assess the performance of diverse agricultural and food system-level interventions on ecosystem services and biodiversity. These frameworks can then be applied across the CGIAR Portfolio, enabling a more holistic and evidence-based understanding of impact. Furthermore, the Program will facilitate science-action dialogues between CGIAR and partners to take stock of the innovations that can help to implement key international commitments related to biodiversity conservation, decreasing land degradation, and desertification, while building resilience to climate change and other shocks.

Aligning with partners' needs and demand

The Program on Multifunctional Landscapes addresses the interdependencies between climate, biodiversity, nutrition, livelihoods, and inequality in land systems. This integrated approach will help countries synergize national biodiversity strategies and action plans linked to the Global Biodiversity Framework, Nationally Determined Contributions, and National Adaptation Plans to deliver Rio Convention targets and contribute to the SDGs.[3] This Program's design is informed by engagement by the Nature-Positive Solutions and Agroecology Initiatives with public-sector, civil society, indigenous, and private-sector actors. During the 2024 CGIAR Listening Sessions, national stakeholders advocated for increased support for conserving (agro) biodiversity, improving soil health (using circular economy principles), improving water quality and security, and addressing climate crises. They agreed on priority for action research focusing on sustainably using natural resources and low-GHG-emission agriculture; on landscape management that integrates diversification, using crops, trees, vegetables, livestock, and fish, including underutilized and native diversity; and on conservation and restoration measures. Stakeholders highlighted CGIAR's supporting role in policy research and development for comprehensive environmental protection and ecosystem health.

The Program on Multifunctional Landscapes will leverage an existing (200+) partner network established in 15+ countries by the Initiatives on Nature-Positive Solutions, Agroecology, Livestock and Climate, and Mixed Farming Systems. It will cultivate alliances with other partners to expand research areas not emphasized in Initiatives and to push further scaling efforts (e.g., community-centered local NGOs, non-CGIAR research organizations such as ICIPE, World Vegetable Center, AGRA, etc.). Some of these organizations already expressed interest in supporting the Program's vision.[4] Stronger links with multi-actor platforms (such as the Agroecology Coalition and the Agroecology TPP, Regen10, and the Food, Agriculture, Biodiversity, Land-use and Energy [FABLE] network) will offer new ways to share evidence-based lessons with policymakers and practitioners.

Linkages with the wider CGIAR Portfolio

The Program on Multifunctional Landscapes will work with

- **The Program on Climate Action** to develop climate-action strategies to reduce GHG emissions and enhance resilience in targeted landscapes.
- **The Program on Sustainable Farming** to focus on plot- and farm-level sustainable solutions.
- **The Program on Better Nutrition** to explore linkages with responsible food consumption.
- **The Program on Policy Innovation** to promote policies, institutions, land tenure, and incentive-based mechanisms to manage private and common lands.
- **The Program on Sustainable Animal and Aquatic Foods** to integrate innovations on improving fish and livestock productivity while mitigating GHG emissions via research on landscape restoration and multi-functionality.
- **The Program on Breeding for Tomorrow** to harness agrobiodiversity and evaluate improved crops and livestock to enhance environmental outcomes, including decreased GHG emissions.
- **The Program on Sustainable Farming** and **the Program on Food Frontiers and Security** on circular economy.
- **The Program on Scaling for Impact** to incorporate evidence-based research into partners' co-designing of solutions and scaling. Finally, collaboration with the three Accelerators will ensure that gender and social inclusion, capacity sharing, and digital and data underpin all the Program on Multifunctional Landscapes's areas of work.

Delivering sustainable diets for nutrition and health – an agenda for evidence-informed transformation: Science Program on Better Nutrition

Mega challenges and opportunities

What populations should consume and what food systems provide are farther apart than ever, resulting in diets that are non-nutritious, unhealthy, and unsustainable, particularly in low- and middle-income countries. Healthy diets are unaffordable for three billion people and progress in diminishing undernutrition has stalled, while overweight, obesity, and diet-related non-communicable diseases are on the rise worldwide. Food environments often promote the consumption of energy-dense, nutrient-poor foods. Amid mounting climate, social, political, health, and ecological threats and conflicts, multiple responses are needed to transform food systems and improve diet and nutrition outcomes, especially for the vulnerable. This challenge is formidable but globally recognized and accepted, as reflected in the ISDC study on Megatrends. We anticipate that relevant high-quality research, innovation, and supportive engagement can move us toward impact. Using consumer-centered approaches to build evidence, the Program on Better Nutrition will strengthen pathways toward the consumption of sustainable healthy diets while fostering inclusive and sustainable food systems.

Contribution to CGIAR's impact

This Program contributes mainly to CGIAR's nutrition, health, and food security goals, alongside gender, social inclusion, poverty, and climate goals. Through impact-oriented research, innovation, and engagement, it will demonstrate how consumer, food environment, and market-centered approaches can trigger demand-led transformation pathways toward better diets, nutrition outcomes, and sustainability. On the consumer side, the Program will generate insights into how to address constraints on availability, accessibility, affordability, and desirability of healthy, safe, and nutritious diets. Broader nutrition outcomes will be supported by complementary efforts in health, education, social protection, and water and sanitation systems.

Scope of work

This Program is anchored in the High-Level Panel of Experts food systems framework, focusing on demand for, affordability of, and accessibility to sustainable healthy diets, without losing sight of the critical importance of food supply challenges for the diverse impact pathways needed to achieve global nutrition goals. The Program on Better Nutrition draws on the best of the combined capabilities of CGIAR and partners. It integrates continuity for innovative research from CGIAR's 2022–2024 Portfolio and bilaterally funded work. Using mixed research methods and approaches and multidisciplinary orientations, the diets and nutritional well-being of low- and middle-income countries' consumers will be connected to social and behavioral drivers, food environments, markets, and the supply of nutritious foods. This Program emphasizes equitable partnerships and supports strong alliances for impact.

The Program's **five interrelated areas of work** consist of

- **Fostering consumption of sustainable healthy diets through food environments and demand-focused innovations.** This research will deliver scalable food environments and demand-focused policies, interventions, and innovations targeting dietary transition drivers (including the structural and governance challenges that shape food environments), aimed at enabling and encouraging healthy dietary choices. This work will demonstrate the potential of consumer demand and food environment-led systems transformation to support sustainable, healthy diets.
- **Strengthening market systems and livelihoods to efficiently deliver diverse, safe, and nutritious foods.** We will test and scale solutions to help grow markets and make market systems more efficient for diverse, healthy, safe, and nutritious foods. These solutions aim for improved logistics and wholesale trade, access to finance, decreased food loss and waste, and profitable micro-, small-, and medium-sized enterprises. We will identify cost-effective mechanisms for ensuring food quality and safety along food value chains. We also aim to provide insights into how trade and domestic agricultural support policies shape food prices and market incentives, and how they can be reoriented to ensure equitable, affordable, and stable access to foods essential to healthy and sustainable diets.
- **Decreasing constraints across value chains of nutrient-dense foods such as fruits and vegetables, indigenous underutilized crops, and animal-source foods.** Addressing dietary challenges also requires overcoming constraints to consumption of specific foods. We will test innovation packages to simultaneously address multiple constraints at scale across food systems – from demand to food environments to supply (including breeding and agronomy) and enabling environments. We will apply similar approaches with underutilized crops, pulses, and animal-source foods for sustainability, resilience, and conservation of biodiversity for nutrition.
- **Leveraging the combined power of multiple systems to achieve diet and nutrition impact at scale for vulnerable populations.** Food system actions to improve diets are necessary but not sufficient to achieve global nutrition goals. To deliver greater impact, we will co-design and test nutrition-sensitive social protection and gender-transformative approaches to tackle desirability of, accessibility to, and affordability of healthy diets for the most vulnerable, including in humanitarian circumstances. We will test and disseminate diet and nutrition interventions in collaboration with health system stakeholders to accelerate nutrition impact for vulnerable age groups such as young children, and explore the potential for school meals to transform the diets of youth and support broader production and local market systems transformation.
- **Strengthening knowledge, governance, and capacity for transformational impact on diets and nutrition.** Translating evidence into impact requires strong leadership and governance at all levels. We aim to improve the quality and use of food systems data and evidence from across the Program's areas of work, as well as political economy analyses and decision support tools. Together, these can support the next generation of leaders through sustained capacity sharing and co-designed food systems governance. This area will include the engagement, convening, and capacity-sharing functions of the Impact Area Platform on Nutrition, Health, and Food Security.

These five interlinked components contribute to diverse global and national initiatives for improving diets and nutrition and transforming food systems in line with global goals for climate, sustainability, and equity.

Aligning with partners' needs and demand

This Program builds on ongoing stakeholder engagement and responds to demands articulated in national food and nutrition policies, strategies, and dialogues. This includes food systems transformation pathways developed as part of the UNFSS 2021 process as well as CGIAR Listening Sessions. African Union platforms and other regional platforms offer numerous opportunities to respond to both regional and national priorities, including the Comprehensive African Agriculture Development Programme (CAADP) and the Africa Regional Nutrition Strategy. In East Asia, the ASEAN Leaders Declaration on Ending All Forms of Malnutrition (2017) and the ASEAN Strategic Framework and Action Plan on Nutrition 2018–2030 underscore the importance of this work. In South Asia, national strategies and action plans have all embraced the centrality of diets and nutrition. The Community of Latin American and Caribbean States (CELAC) adopted a new Plan for Food and Nutrition Security 2024–2030, focusing on legal frameworks, sustainable production, and healthy diets. These are only examples of the numerous entry points for large-scale impact of CGIAR's research on diets and nutrition.

Linkages with the wider CGIAR Portfolio

The Program on Better Nutrition's consumer-focused, diets-centered body of work links to several other CGIAR streams of research. From a supply perspective, it links with work on breeding for nutrition (Program on Breeding for Tomorrow), agronomy and diversification (Program on Sustainable Farming), and animal and aquatic foods (Program on Sustainable Animal and Aquatic Foods). Given the strong social underpinnings of poor diets and nutrition, links with The Accelerator on Gender Equality and Inclusion are crucial. Engagement with the Program on Food Frontiers and Security will focus on strengthening action for nutrition in fragile settings and urban areas. Essential ties to governance and policy entry points will be built with the Program on Policy Innovation. Data and digital approaches to shape transformation will be co-constructed with the Accelerator on Digital Transformation. The consumer-led transformation agenda of dietary choice pathways toward climate resilience, biodiversity, and sustainability will be explored with the Programs on Climate Action and Multifunctional Landscapes. Finally, close links with the Program on Scaling for Impact will ensure that scaling efforts fully consider diets and nutrition.

Climate actions for resilient food, land, and water systems: Science Program on Climate Action

Mega challenges and opportunities

The science is clear – we are on a pathway to breach the crucial 1.5 °C limit in less than a decade. The most vulnerable populations, such as small-scale producers and other marginalized actors, are facing the most severe losses and damages – including increases in food insecurity and malnutrition – and finding it increasingly hard to make a living. The Program on Climate Action addresses the high-stakes climate crisis by delivering cutting-edge innovations and leveraging collaboration across various levels, production systems, and geographies to accelerate adaptation and emissions reductions across food, land, and water systems while also improving the food, nutrition, and water security and livelihoods of small-scale producers. All pathways to meeting the Paris Agreement climate targets require rapid, significant, and sustained GHG emissions reductions in all sectors. Although the agri-food sector contributes a third of emissions and is extremely vulnerable to climate change, it can also be part of the solution by decreasing emissions, strengthening carbon sinks, and increasing resilience. To stay within a 1.5 °C temperature increase limit, emissions must be diminished by at least 43% by 2030 and by at least 60% by 2035 compared to 2019 levels. On the adaptation front, actions should focus on the most affected producers and consumers and most food-insecure communities.

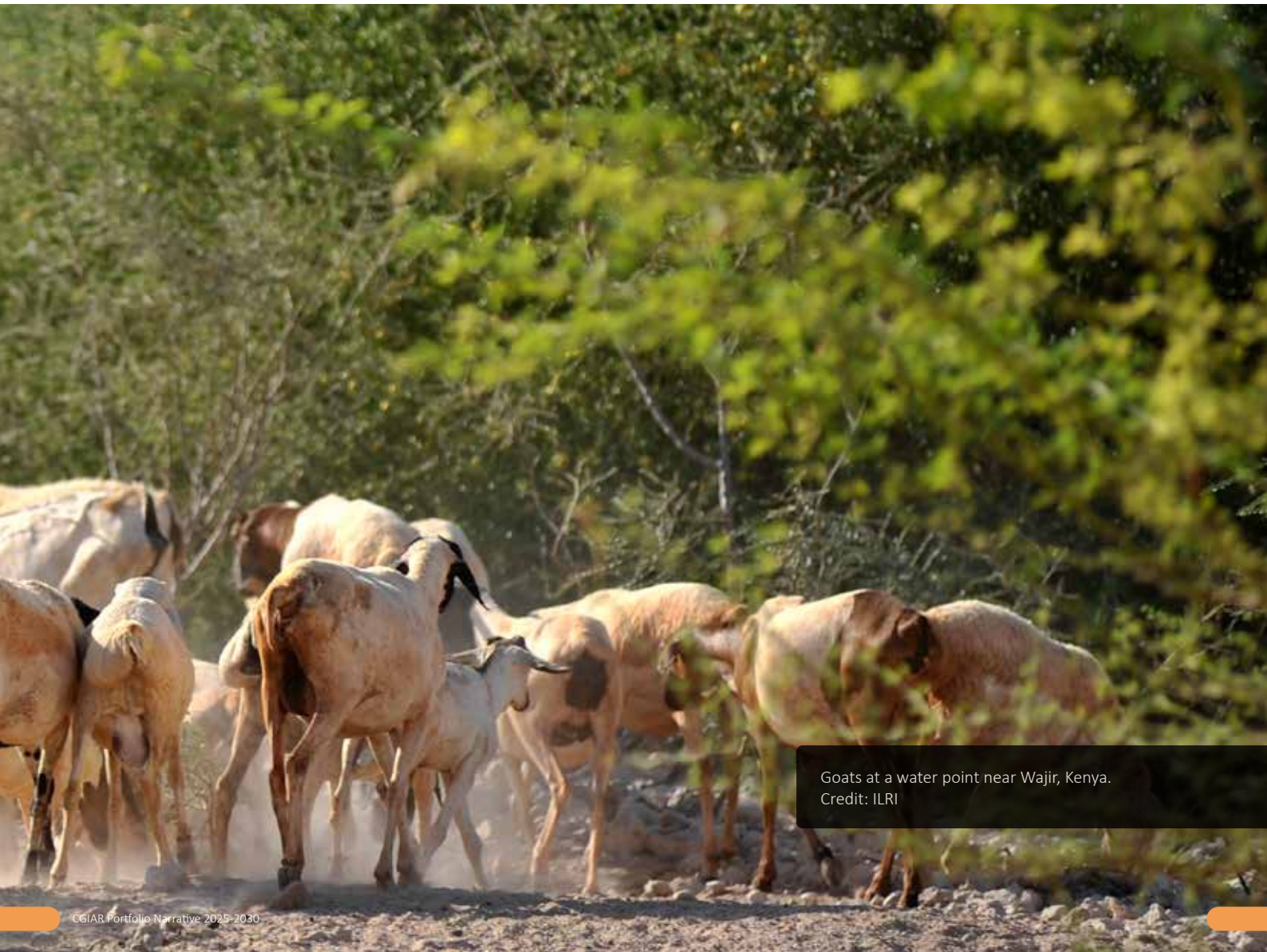
Contribution to CGIAR's impact

The Program on Climate Action will address climate threats across interconnected food, land, and water systems and by delivering on CGIAR's 2030 collective global targets on climate adaptation and mitigation.[5] High-level outcomes related to CGIAR's five Impact Areas involve decreasing poverty, especially among the vulnerable, by protecting and improving the income and livelihood of farmers, livestock keepers, fisherfolk, and forest-dependent people through adaptation and mitigation strategies; improving nutrition outcomes by improving climate-resilient food production and food system stability; and championing integrated land, water, and soil management that promotes environmental health and preserves biodiversity.

Scope of work

The Program on Climate Action's objectives will be achieved through co-creating targeted, effective, solution-oriented, and scalable adaptation and low-emissions development strategies across food, land, and water systems; understanding barriers to and enablers

5 Implement all National Adaptation Plans and Nationally Determined Contributions to the Paris Agreement; equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems; and turn agriculture and forest systems into a net sink for carbon by 2050, with emissions from agriculture decreasing by 1 Gt per year by 2030 and reaching a floor of 5 Gt per year by 2050.



Goats at a water point near Wajir, Kenya.
Credit: ILRI

of the adoption of technologies/solutions and accelerating their adoption at scale; and supporting climate policies and processes. The work of this Program draws on knowledge, experience, and partnerships from several CGIAR Initiatives (Climate Resilience, Low-Emission Food Systems, NEXUS Gains, Livestock and Climate, and HER+, among others) and bilateral programs (e.g., AICCRA). The five areas of work aim to (1) assess the impacts of climate change on food systems, ecosystems, and water resources and vice versa and how these impacts affect different stakeholders and populations; (2) support adaptation and resilience for food and water security under current and future climatic conditions; (3) foster mitigation actions with adaptation co-benefits; (4) ensure that climate actions for food, land, and water systems lead to a just transition that benefits small-scale producers and other marginalized actors; and (5) bring together CGIAR's climate research to influence policies and processes through knowledge and advocacy. By pursuing these areas of work in an integrated manner, the Program on Climate Action will enable CGIAR's in-country partners, communities, and the private sector to work together to decrease the agri-food sector's contribution to GHG emissions while building livelihoods and income opportunities for the most vulnerable

- **Assessing impacts:** This area of work assesses the impact of current and future climate conditions on food, land, and water systems and vice versa. It studies the implications of the changing climate for livelihoods; food, water, and nutrition security; gender equality; peace; and social inclusion. It assesses the specific impacts of climate and climatic hazards on vulnerable food, land, and water systems, geographies, and populations. It supports the co-development of GHG inventories by creating local capacity to measure and monitor emissions from food, land, and water systems and improving and harnessing the capabilities of climate analytics and crop/ecosystem/GHG/economic modeling alongside machine learning and AI to support monitoring, reporting, and verification (MRV), corporate environmental, social, and governance (ESG) actions, and reporting of Nationally Determined Contributions (NDC).
- **Accelerating adaptation:** This area of work will co-design, co-create, and co-evaluate gender-transformative adaptation actions across food, land, and water systems to decrease climate risk, increase climate resilience, and manage trade-offs across the food, energy, water, and ecosystem nexus and their effects on resilience across sectors. It will notably include work on climate information services and early warning systems, e-extension of contextual climate-smart agriculture practices, resilient crop/water/livestock/agroforestry/fisheries production and postharvest systems, resilient water investments and practices, climate risk insurance, social safety nets, and peace responses. It will also develop knowledge to increase the conflict sensitivity of climate action, policy, and finance and develop innovative adaptation metrics to assess the effectiveness of adaptation actions.
- **Driving mitigation with adaptation co-benefits:** This area of work will explore a range of tailored, cost-effective, gender- and youth-transformative mitigation actions and low-emission development pathways, assessing adaptation trade-offs and co-benefits across food, land, and water systems in specific contexts and under current and future climate and socioeconomic conditions. Specific activities will consist of exploring the capacity of land to act as a net carbon sink in a 1.5 °C warmer world; developing resource-efficient precision technologies across food, land, and water systems; facilitating the use of renewable energy systems, circular economy approaches, and carbon capture technologies; and assessing the potential trade-offs between land, water, food, and existing mitigation approaches, while also delivering cutting-edge research for the next generation of GHG mitigation technologies such as microbiome, methane/nitrification inhibitors, alternative proteins, and smart agronomic solutions. All mitigation solutions will be evaluated under strict social equity and no-harm/do-better lenses.
- **Enabling just transitions:** This area of work aims to ensure that climate action yields just and equitable outcomes for the most vulnerable, accelerate progress toward CGIAR climate targets, and scale climate solutions by coupling technical advances with participatory research and innovations on power and positionality such as policies and institutions, political economy, governance mechanisms, market instruments and non-market approaches, and finance. Special focus will be placed on co-designing such innovations with local actors, inclusive digital augmentation and e-extension, capacity sharing, governance efforts, avoiding maladaptation actions, and business model development, linking producers to innovative markets and mobilizing green finance for small-scale producers.
- **Amplifying science to influence change:** By integrating the functions of the CGIAR Climate Adaptation and Mitigation Impact Area Platform and other integrative efforts, this area of work will bring together CGIAR's climate research to amplify and influence change toward delivering maximum impact. The activities will involve (1) convening a community of practice to coordinate CGIAR's climate work and stimulate collaboration and knowledge sharing; (2) deepening CGIAR and partners' capacity to help to achieve national climate targets; (3) amplifying the external profile of CGIAR's climate work through advocacy, providing evidence for supporting IPCC assessments and UNFCCC negotiations on food, land, and water systems, and informing climate policies globally, regionally, and nationally; and (4) developing and implementing monitoring, evaluation, and learning tools to track the effectiveness of climate interventions within food, land, and water systems to monitor and advise on CGIAR efforts to achieve climate outcomes.

Aligning with partners' needs and demand

The Program on Climate Action meets the demand of national partners, as well as adaptation and emission targets set through UNFCCC, by developing science to support National Adaptation Plans and NDC processes and implementation. In the 2024 CGIAR Listening Sessions, country representatives reported that climate change research is high on their agendas when it comes to working with CGIAR, and the Program on Climate Action's areas of focus (impacts, adaptation, mitigation, and enablers) received particularly strong interest.

Linkages with the wider CGIAR Portfolio

The Program on Climate Action unites research efforts across Programs and Accelerators for maximum impact. By collaborating with all Programs, the Program on Climate Action tackles climate challenges across food, land, and water systems. Areas of collaboration will involve fostering nature-based solutions (with the Program on Multifunctional Landscapes) and enabling climate-smart institutions and policies (with the Program on Policy Innovation), climate-smart sustainable diets (with the Program on Better Nutrition), climate-smart genetic innovation (with the Program on Breeding for Tomorrow), and climate-smart agronomy (with the Program on Sustainable Farming). The Program on Climate Action will also collaborate to support animal and aquatic food systems for the circular economy (with the Program on Sustainable Animal and Aquatic Foods), climate actions toward peace and socioeconomic sustainability (with the Program on Food Frontiers and Security), strategic scaling (with the Program on Scaling for Impact), holistic capacity development (with the Accelerator on Shared Capacity), digital augmentation (with the Accelerator on Digital Transformation), and gender inclusivity in climate actions (with the Accelerator on Gender Equality and Inclusion).

Innovative institutions and policies for food, land, and water systems transformation: Science Program on Policy Innovation

Mega challenges and opportunities

Decision makers need high-quality actionable information and tools to prioritize, design, implement, and evaluate coherent and cost-effective policies and investments to drive sustainable food, land, and water systems transformation while simultaneously navigating climate shocks, global crises, and complex political economy landscapes. To respond to and anticipate future trends more effectively, the Program on Policy Innovation focuses on interlinks and trade-offs of system-level challenges and outcomes, while also considering micro-level insights into how food, land and water system actors and institutions respond to exogenous shocks, external trends, and policy changes.

Our vision is that national, regional, and global partners gain access to, and the skills to deploy, state-of-the-art tools, data, and analytical frameworks to inform evidence-based decisions about policies and investments to transform food, land, and water systems in ways that improve nutrition, food security, water security, livelihoods, climate adaptation and mitigation, and environmental outcomes, with attention to social and gender inclusion. The Program will contribute to four overarching outcomes: (1) evidence-based global, regional, and country-level responses to megatrends; (2) improved access to and use of state-of-the-art tools, analytics, and data; (3) improved design, development, and uptake of technological and institutional innovations; and (4) strengthened governance of food, land, and water systems locally, nationally, and regionally.

This Program leverages three key strengths: (1) cutting-edge research capabilities to assess and predict complex interactions, synergies, and trade-offs among and within ongoing megatrends; (2) established relationships with policy-making, research, and implementation partners in low- and middle-income countries; and (3) linkages with global policy and research networks. In the past few years, these strengths have facilitated multiple policy and investment decisions by countries and development organizations, including decisions related to the role of food, land, and water systems in overall development strategy; technology adoption policies; and rapid responses to external shocks such as the COVID-19 pandemic, the conflict in Ukraine, and extreme climate events.

Contribution to CGIAR's impact

By leveraging an extensive bilateral research portfolio and through collaboration with other Programs, the Program on Policy Innovation aims at substantially increasing the level and intensity of CGIAR's policy engagement. Through efficiency gains in analytics, capacity building, and expanded scope for cross-country and regional learning, the Program on Policy Innovation expects to strengthen results across all CGIAR Impact Areas.

The Program on Policy Innovation's theory of change aligns with policy processes, which are strongly mediated by political economy and power considerations, including often contentious political discourse. These processes tend to be characterized by extended periods of refinement within a political economy paradigm, punctuated by periods of rapid reform. Key elements of the ToC include (1) **research quality** (a required basis for informing improved policies and institutions and avoiding the high costs of poor decisions based on low-quality information); (2) **co-development** (processes need to be owned by key stakeholders to build trust and yield sustainable benefits); and (3) enabling **policy, technological, and institutional innovation** (novel approaches are required to enable substantial and simultaneous progress across all five CGIAR Impact Areas). In summary, the Program on Policy Innovation creates impact through high-quality, consistent, and demand-driven engagement coupled with selective and agile responses to opportunities for major reforms.

Scope of work

The Program on Policy Innovation comprises four interconnected activity blocks: research, policy engagement and communications, capacity building, and finance.

Research

The Program's research focuses on four interacting research domains:

- **Global to local to global analytics.** This involves situation analysis and outlooks at multiple scales, including stakeholder-driven future scenario setting; policy and investment prioritization including research and development; vulnerability mapping; risk management; resilience building including social protection; timely and effective policy response to shocks and crises; international trade and domestic support policies; and market functioning and value chain upgrading, with emphasis on market failures including externalities and competition issues.
- **Institutional reform and innovation.** This area of work will address institutional constraints (policies, laws, socio-cultural norms, and beliefs), which are often major obstacles to structural transformation of food, land, and water systems. For example, institutional innovation is crucial to fostering sustainable natural resource use.
- **Evidence-building** related to technological, policy, and institutional innovations with emphasis on (1) uncovering causal mechanisms at more spatially granular levels and (2) implications of and constraints to bringing innovations and reforms to scale. This work requires novel empirical evidence through multidisciplinary research methods on the meso- and micro-level drivers of transformation, with attention to gender mainstreaming and social justice.
- **Political economy** analysis to ensure the relevance of the work program, evaluate power dynamics between actors, analyze the strategic and political role of staples in food sovereignty, and consider multi-sectoral governance approaches to addressing implementation of complex policy issues at multiple scales.

Each research domain will involve (1) advancing frontier research, (2) demand-driven and co-developed work focused on approximately 30 countries where CGIAR maintains ongoing relationships with key decision-making institutions, and (3) the provision of global perspectives/analytics and facilitation of cross-country learning. The Program on Policy Innovation will concentrate analytical resources on selected large studies with high potential for greater impact. Selection criteria for these studies will be demonstrated interest from key stakeholders, active engagement from local policy research ecosystems, scientific merit in line with the comparative advantages of CGIAR, and linkages with other Programs.

Policy communication and engagement: To avoid business as usual and contribute to expected impact of research on innovative policies and institutions, the Program on Policy Innovation will place high priority on communication and engagement locally, nationally, regionally, and globally for response to demand and co-development.

Woman washing wheat (wafaa).
Credit: Hamish John Appleby / IWMI

Capacity building: Effective capacity building is both a goal in itself and a key pathway to impact. The Program on Policy Innovation will seek to actively deploy South-South and South-North-South approaches, e-learning techniques, and formation of communities of policy practice in collaboration with the Accelerator on Shared Capacity.

Finance: Although most resources to finance food, land, and water systems transformation will be domestically generated, external finance can play leading and catalytic roles. Through engagement with institutions such as central banks, IFIs, the GCF, UN Conventions, and the NDC Partnership, as well as private-sector finance, the Program on Policy Innovation aims to put in place a virtuous circle of bankable plans, coherent policies, and effective mobilization of finance in collaboration with the Scaling Program and Science Programs.

Aligning with partners' needs and demand

The Program on Policy Innovation's large network of R&D partners is a principal strength. This Program will work to maintain and expand this network, drawing upon CGIAR's Listening Sessions. The Program on Policy Innovation leverages (among others) (1) 14 Country Programs established at the request of key policy-making institutions in the host countries (representing USD 28.5 million in bilateral support in 2023); (2) cutting-edge analytical suites for 35 countries for which there is strong demand from governments and other partners (representing USD 8 million in bilateral support in 2023); (3) multi-disciplinary efforts in water security; and (4) excellent relationships with influential regional institutions such as the African Union.

Linkages with the wider CGIAR Portfolio

The larger studies mentioned above will serve as an important vehicle for collaboration with other Programs and key partners. The Program on Policy Innovation expects to undertake at least one larger study in collaboration with each of the other Programs, selecting topics and geographies according to the criteria listed above and drawing upon the core strengths of collaborating Programs. Examples of potential themes for collaboration with other Programs are social protection and economic inclusion (Accelerator on Gender Equality and Inclusion); nutrition and public health (Better Nutrition); rice production, markets, and international trade (Breeding for Tomorrow, Sustainable Farming, Food Frontiers and Security); water security and water trade (Climate Action, Multifunctional Landscapes, Food Frontiers and Security); regional approaches to climate change (Climate Action); and environmental sustainability (Climate Action, Multifunctional Landscapes).

Securing future foods for all: Science Program on Food Frontiers and Security

Mega challenges and opportunities

From the Green Revolution to empowering women in agriculture, CGIAR has a history of shaping food systems. The Program on Food Frontiers and Security focuses on the next frontiers in research and geographies to ensure that emerging challenges and future transitions are served by ambitious innovations and evidence developed by CGIAR researchers and partners.

This Program primarily addresses three megatrends affecting today's agri-food systems (see Section 2.1): demographic changes, geopolitical instability, and emerging frontier technologies and innovations. Climate change and environmental degradation intensify these challenges and undermine the opportunities arising from these trends, often fueling conflict, migration, and competition for dwindling natural resources. In addition, growing inequalities and changing consumption patterns demand novel policies, programming, and technologies to promote healthy and sustainable diets in areas where food is scarce or healthy options are not readily available.

By 2030, about two-thirds of the world's extremely poor will live in fragile and conflict-affected settings (FCASs). People living in FCASs struggle to maintain resilient food and water systems and they face food shortages and malnutrition. Until recently, they have not been well served by the traditional CGIAR impact pathways. Another significant transition is that, by 2050, more than two in three people will live in urban areas, with a growing share of youth in low- and middle-income countries looking for livelihood alternatives to traditional rural farming. Cities can offer those opportunities and serve as a catalyst for food system innovation due to the concentration of diverse actors who drive advances; however, they often provide insufficient access to nutritious food and combine resource scarcity, pollution, adverse shocks, governance shortfalls, and inadequate infrastructure. The objectives of this Program will be to (1) support today's food producers and consumers and anticipate the needs in these critical changing geographies and (2) make promising food systems innovations available to those who would benefit most.

Contribution to CGIAR's impact

Poverty, food and nutrition insecurity, gender inequities, biodiversity loss, and environmental degradation are prevalent in fragile and conflict settings. It is often impossible or ineffective to tackle these problems through traditional CGIAR pathways, such as improving government policy and strengthening national agri-food research organizations. In cities, municipal, corporate, and civil society actors may be more influential than national governments and state institutions and represent alternative innovation and scaling partners. Therefore, the Program on Food Frontiers and Security works through partnerships outside the traditional agri-food innovation system to secure access to opportunities for production, distribution, and consumption of safe, nutritious food for vulnerable people in these geographies. It thus helps to achieve impact in all five CGIAR Impact Areas. Environmental health and natural resource systems are particularly challenged in the context of urban growth, demographic change, and conflict – especially when these trends are rapid and dynamic. Therefore, the Program on Food Frontiers and Security also helps to strengthen CGIAR's fast-evolving and recognized role at the food, land, and water systems nexus.

Scope of work

The Program on Food Frontiers and Security will build on the Centers' frontier research work in food systems transformation and the progress made by the Fragility, Conflict, and Migration and Resilient Cities Initiatives. We achieve our goals through three interacting areas of work:

- **Building on the work of the Fragility, Conflict, and Migration Initiative, we promote science-based solutions for food and water security in contexts of fragility and conflict.** The growing incidence of compound crises due to geopolitical instability, climate change, and rising inequalities calls for CGIAR investments in vulnerable populations and the actors and agents supporting them through (1) prevention and preparedness, as early action and disaster risk reduction are highly cost-effective means of addressing shocks; (2) bridging the humanitarian-development-peace nexus by leveraging long-term sustainability principles in emergency and conflict contexts; and (3) promoting recovery from conflict and crises through effective social protection and humanitarian response systems and building stable livelihoods, women's empowerment, social cohesion, and long-term resilience. This work will build on analysis of drivers and impacts of migration and mitigating forced migration, learning and partner decision support, and specialized public and private partnerships with humanitarian and development actors.
- **Building on the work of the Resilient Cities Initiative, we develop science-based solutions for food system resilience in urban and peri-urban areas.** Rapid urbanization disrupts the balance of water, land, and energy resources. Peri-urban areas are crucial for both feeding cities and overcoming resource depletion. Therefore, we will produce evidence, technologies, and capabilities for resilience, focusing on the urban poor. Key areas of work involve (1) safe and sustainable food production, including urban agriculture; (2) circular bioeconomy, turning urban food waste into resources for food production; (3) sustainable water and wastewater management, such as nature-based solutions for flood and drought mitigation; and (4) inclusive informal markets – all creating opportunities for women and youth. We also target (5) food loss and waste management, including postharvest management innovations; (6) market systems and values chains, particularly in informal markets; and (7) availability of and access to safe and nutritious foods, including novel proteins for all urban populations.
- **The Future Food System Lab is a new convening space for CGIAR and partners to rapidly identify and respond to technological and institutional changes in food systems.** In the next 30 years, what is eaten will change in response to the many challenges outlined, just as it has over the past 30 years. CGIAR should be part of the frontier evolution of food systems. The lab builds the horizon-scanning, screening, systems thinking, and visioning capabilities of CGIAR and partners to ensure that promising innovations from all sources are considered in our programming, and local innovators have a place to test and apply their ideas. To strengthen the resilience of food systems against increasingly frequent shocks, innovations are needed across, inter alia, data systems and decision-support tools, novel financial services, and labor-saving technologies. Exploring digital innovations to shorten food supply chains, alternative production systems that are more efficient in critical inputs such as soil and water (e.g., vertical farming, precision irrigation, hydroponics, aquaponics, insect farming, and smart farming technologies), and urban agriculture initiatives in deprived areas can create more robust and localized food systems. While the food systems lab supports the first and second areas of work, it also serves the broader agri-food innovation system.

The three areas of work are linked through the many intersecting challenges between FCASs, urbanization, and food system innovation. These include migration and displacement from FCASs to cities, circular economy solutions for both cities and refugee camps/host communities, the need to deliver healthy diets and nutrition amid evolving and often crisis-stressed consumption patterns, and a strong focus on gender and social inclusion.

Aligning with partners' needs and demand

The Program on Food Frontiers and Security leverages partnerships for collaborative solutions drawn from CGIAR's Listening Sessions, the Fragility, Conflict, and Migration and Resilient Cities Initiatives, and major bilateral investments in these and other settings, such as small island states. The demand to address the challenges of conflict, fragility, and rapid urbanization is extremely high among humanitarian and development partners, public- and private-sector actors, city councils, municipalities, and civil society. This Program acknowledges and builds on cities' roles in driving food system sustainability transitions. Prioritizing stakeholder engagement and scalability is pivotal in the Program's **Future Food System Lab.**

Linkages with the wider CGIAR Portfolio

This Program will work with almost all Programs and Accelerators. Some initial priority areas of collaboration are the following:

- With the **Program on Climate Action**, to promote peace and social cohesion and decrease the climate impact of cities by understanding and shaping their food demand and climate-proofing of water systems.
- Inclusive and regenerative agri-food systems and circular economy models in peri-urban and fragile, conflict, and migratory contexts align well with the agroecological transitions promoted by the **Program on Multifunctional Landscapes**.
- With the **Program on Policy Innovation** to analyze policies, programming, and interventions, including novel social protection systems, that promote system resilience amid fragility and recovery from crises and conflicts.
- Focus on strengthening action for improved nutrition in new geographies such as fragile settings and urban areas, as well as in the development of new nutrient-dense foods with the **Program on Better Nutrition**, including for displaced and conflict-affected populations and vulnerable groups.
- With the **Program on Breeding for Tomorrow,** work to include food plants and animals important in FCASs and urban contexts in breeding programs. These include both traditional crops neglected in breeding, such as taro, millet, and sorghum, and new sources of food and animal feed, such as insects and seaweed.
- **With the Programs on Sustainable Farming and Sustainable Animal and Aquatic Foods** to ensure that crop and animal production systems adapted to conflict-affected, fragile, and land-limited urban/peri-urban settings (e.g., home, vegetable gardens, low-cost poultry and fish production units) benefit from advances in agronomy and plant and animal health.

There is close collaboration with the three Accelerators. Our proposed work in these areas involves adaptive social protection to deliver benefits for women and youth, gender-equitable urban agriculture and women's empowerment, digital extension and financial services, early warning systems and decision-support tools, a joint agenda to localize and de-colonize research, and a forum to build and share capacity in system thinking, nexus approaches, foresight, and scenario analysis.

Empowering regions and countries to scale demand-driven, evidence-based, and impactful agri-food systems solutions: Program on Scaling for Impact

Mega challenges and opportunities

CGIAR's research and engagement agenda is at a critical crossroads: While half a century of research for development by CGIAR and its partners provides a strong foundation to overcome food, land, and water systems challenges, the widespread adoption and continuous use of innovations – including technological advances in farming practices, social and institutional processes, and evidence and policy support – have only partially achieved the level needed to ensure transformative and durable change. Efforts to overcome this problem are undermined by interacting and risk-multiplying challenges: climate change, natural resource degradation, geopolitical instability, and demographic shifts such as migration and displacement. They are further compounded by rising inequality, high inflation, weak enabling environments, and increasingly resource-consumptive and unhealthy diets. The Program on Scaling for Impact takes a disruptive approach to overcome these obstacles by (1) more robustly engaging with regional and national stakeholders to assist Science Programs in prioritization and ensure responsiveness to game-changing research and scaling opportunities, (2) serving as the core integrator of CGIAR's scaling science and practice efforts, and (3) generating evidence to improve enabling environments and policies and leverage innovative finance and public-private partnerships to drive large-scale transformative impact.

Contribution to CGIAR's impact

A systematic approach to Portfolio-wide, demand-driven scaling: The Program on Scaling for Impact reflects CGIAR's recognition of the urgent need to formalize coordination and ensure Portfolio-wide economies of scale and scope to achieve accelerated impact toward 2030 targets. As the integrative heart of CGIAR's scaling efforts, the Program on Scaling for Impact will take a systematic approach to overcome fragmentation risk across the Portfolio. This will be achieved by: **(1) Signaling demand for research and scaling:** The Program will systematically communicate regional and country-based stakeholders' demand for research, innovation, and scaling to CGIAR's Programs. This will be achieved through regular stakeholder surveys and integrated agri-food system assessments to prioritize research and scaling efforts. In close collaboration with Country Conveners working across the Portfolio to further improve CGIAR's science engagement in countries, the Program will support iterative learning, improved engagement, and enhanced research efficiency. **(2) Scaling science and practice:** CGIAR's Innovation Packages and Scaling Readiness (IPSR) approach will be improved, and complementary frameworks will be used to engage stakeholders and Programs in co-creating, testing, refining, and adapting innovation bundles (combinations of technologies and practices) to chart context-appropriate scaling strategies. The Program will develop a global clearinghouse of CGIAR and partners' innovations. Inventoried regularly, the clearinghouse will provide information on innovation bundling opportunities, risks, and trade-offs to support adaptive research and scaling investment prioritization. **(3) Achieving impact:** The Program on Scaling for Impact will support actions enhancing coordination among Programs, thus decreasing overlap and inefficiencies to streamline scaling efforts throughout CGIAR's Portfolio. Working with IFIs such as World Bank Group, Asian Development Bank (ADB), African Development Bank (AfDB), and Inter-American Development Bank (IDB); governments; and impact investors, the Program will position CGIAR as a technical support partner on large-scale development programs providing science-based advisories on context-based and fit-for-purpose innovation delivery. Scaling funds and agribusiness acceleration programs will incentivize Programs, bilateral projects, and public and private collaborations.

Key pathways to impact: (1) Improved internal and external synergies: The Program will increase internal coherence across CGIAR's Portfolio through its integrative mandate to improve the design and adaptation of innovation bundles and packages to overcome adoption barriers. A detailed roadmap on how multiple Programs can integrate scaling activities will be developed to boost collaboration and avoid overlap. Close collaboration with CGIAR's Country Conveners will enhance coordination and leverage CGIAR's comparative advantage as a credible scientific broker to coordinate demand, research, and scaling partners. **(2) Feedback loops**: By conducting iterative research and collaborating across Programs and partners to co-create, test, refine, and implement socio-technical innovation bundles, and by applying AI and big data to better delineate market segments and identify factors that enhance enabling environments, the Program on Scaling for Impact will increase research efficiency, decrease adoption risks, and shorten research-to-application cycles. **(3) Enhanced enabling environments**: Collaborating with the Program on Policy Innovation and Country Conveners, the Program on Scaling for Impact will leverage its presence in-country and regionally to overcome policy obstacles and enhance enabling environments. **(4) Unlocking financing, market systems, and entrepreneurship**: Providing evidence to enhance CGIAR's collaboration with IFIs, impact investors, governments, and the private sector, transformative financing mechanisms (e.g., green finance, carbon credits, and payments for ecosystem services) will be unlocked to support scaling. This Program will also support collaboration between agri-food systems actors and Programs to enhance scaling along value chains from the farm gate to consumers through competitive agribusiness accelerators and incubators. **(5) Scaling capacity enhancement**: Together with the Accelerator on Shared Capacity, the Program will enhance NARES capacity in scaling science and practice through South-South exchange and on-the-job learning collaboration with CGIAR.

Scope of work

The Program on Scaling for Impact's key areas of work will be the following:

- **Ensuring bottom-up demand-responsiveness** by formalizing processes for regularly quantifying, updating, and communicating robust regional and country-based stakeholder demand to CGIAR's Programs. The Program on Scaling for Impact will support iterative learning, re-prioritization, and adaptive management of research and scaling activities across the Portfolio.
- **Making scaling science actionable** by helping other Programs and stakeholders to apply novel scaling frameworks to enhance agricultural production, market, and consumer innovation research and scaling efforts in the context of climate change. The Program on Scaling for Impact will boost internal and external CGIAR collaboration and cost-effectiveness, helping to close the gap toward CGIAR's 2030 targets.
- **Iterative learning and feedback** by supporting other Programs, bilateral projects, and CGIAR's partners to co-identify, couple, and improve the most promising socio-technical innovation bundles across CGIAR's innovation portfolio. Applying and communicating evidence from scaling effectiveness assessments, the Program on Scaling for Impact

will also assist in iterative learning and re-prioritization of CGIAR's research and scaling agendas.

- **Enhancing enabling environments.** Many scaling efforts falter because they do not adequately account for demand and overlook the risks, complexities, and trade-offs associated with expediting innovations into use. The Program on Scaling for Impact will enhance enabling environments by identifying how more equitable use of innovation bundles can be supported through improved access to information, finance, and markets, along with increased capacity and policy support. Effectiveness and impact studies will create evidence of the most cost-effective, fastest, and most responsible delivery and scaling mechanisms.
- **Achieving impact.** Ground-breaking scaling of finance opportunities will be unlocked through enhanced collaboration with IFIs. Competitive accelerator funds will incentivize innovative cross-Program collaboration with public and private partners to scale innovations.

Aligning with partners' needs and demand

CGIAR's Listening Sessions underscore growing interest among stakeholders in coordinated research and scaling efforts. Building on the Regionally Integrated Initiatives and the National Policies and Strategies and Seed Equal Initiatives, the Program on Scaling for Impact will strengthen and expand beyond the current collaboration with 1,085 partners that has yielded 209 reported innovations since 2022, now being bundled and tested as packages. The Program on Scaling for Impact will work across South Asia, East and Southern Africa, West and Central Africa, Southeast Asia and the Pacific, Latin America and the Caribbean, Central and West Asia, and North Africa. In collaboration with other Programs and within regions, rigorous prioritization will target specific countries and the food and farming systems most challenged by ISDC's megatrends where innovations can have the most impact, while enlisting collaboration and the political will to drive transformation.

Linkages with the wider CGIAR Portfolio

The Program's internal Scaling Science structure mirrors the production- to-consumption continuum of agri-food systems. It features areas of work that address unique challenges in scaling agricultural production innovations, facilitating collaboration, and offering opportunities to support the Programs on Breeding for Tomorrow, Multifunctional Landscapes, and Sustainable Animal and Aquatic Foods. Collaboration with the Program on Policy Innovation will focus on supporting value chain and market innovation scaling, while consumer innovations will be developed, refined, and scaled in collaboration with the Program on Better Nutrition. A cross-cutting workstream will focus on environmental sustainability and enhance scaling synergy with the Programs on Climate Action and Multifunctional Landscapes, while the Food Systems Lab of the Program on Food Frontiers and Security will be supported through scaling strategy co-development. Collaboration with the Accelerators on Gender Equality and Inclusion, Shared Capacity, and Digital Transformation will ensure socially inclusive scaling meeting the needs of marginalized groups, promote South-South scaling of science learning exchanges, and apply AI tools to scaling challenges.

Seed regeneration plots at American University of Beirut's AREC station near ICARDA's Terbol station in Lebanon's Beqaa Valley.
Credit: Michael Major / Crop Trust

Accelerator on Gender Equality and Inclusion

Mega challenges and opportunities

By advancing gender equality and social inclusion, we unlock numerous opportunities to upend structural barriers and support women, youth, and other vulnerable groups, such as Indigenous Peoples, in their roles as agents of global change in times of complex and intertwined poly-crises.

Anthropogenic megatrends, such as urbanization and digitization, represent both challenges and opportunities: they risk increasing food, nutrition, and economic insecurity while exacerbating inequalities, but also create opportunities for empowerment and equality in food, land, and water systems. The development and use of innovative methods, tools, and skills, including gender- and youth-responsive digital technologies, should be harnessed to help achieve gender and social inclusion (GESI) outcomes.

The Accelerator on Gender Equality and Inclusion will address structural and institutional drivers of disadvantages through research that empowers and transforms to ensure that diverse voices contribute to solutions and impacts that are more than the sum of their parts. It will support women, youth, and other groups to transform food, land, and water systems and accelerate resilience, food security, job creation, remunerative value chains, poverty reduction, environmental health, and prosperous livelihoods for all.

Contribution to CGIAR's impact

The Accelerator on Gender Equality and Inclusion will use **three main pathways** to strengthen CGIAR research on gender equality and social inclusion toward addressing the challenges of widespread multidimensional gender and social inequalities in food, land, and water systems:

- Conduct foundational GESI research to **transform discriminatory social institutions and unequal power relations** across multiple levels for more equitable food, land, and water systems (i.e., gender lab).
- Integrate GESI research into CGIAR Program research to **develop, test, and deliver gender-responsive and socially inclusive technical and social solutions and innovations** to enhance resilience and efficiency of food, land, and water systems (i.e., leveraging).
- **Synthesize the evidence** generated by the Accelerators and Programs, and identify new GESI research themes and existing gaps for CGIAR to pursue (i.e., taking stock).

The Accelerator on Gender Equality and Inclusion will develop capacity (jointly with the Accelerator on Shared Capacity), share knowledge, and reinforce key alliances to support implementation and dissemination of the research and inform development of policies and institutional reforms. Outputs will be used by decision- and policymakers, researchers, funders, and implementing organizations to inform, guide, and accelerate their work, processes, and decisions to become more gender responsive, inclusive, and transformative

The Accelerator on Gender Equality and Inclusion will ultimately contribute to outcomes – through partners and other food, land, and water system stakeholders – that build people's capacity to respond and adapt to climate change, secure sustainable healthy diets, achieve food security, and adopt environmentally sustainable land, forest, and water management practices.

This Accelerator will also lead CGIAR in developing indicators for monitoring and evaluating progress on gender equality and social inclusion and assess the impacts of its research at multiple scales.

Scope of work

The Accelerator on Gender Equality and Inclusion builds on past and current research in CGIAR, the Gender Equality Initiative (HER+), and the GENDER Impact Area Platform. The Accelerator will contribute to co-designing primary research, tools, approaches, and indicators on gender equality, social inclusion, and women's and youth's empowerment, with partners and food, land, and water systems stakeholders. This will span three areas of work across the three pathways:

- **Informal and formal social institutions:** Gender-transformative approaches to overcome discriminatory gender and social norms and formal institutions (e.g., policies and laws, rights, and regulations) that create disadvantages for and exclude women, youth, and other groups in food, land, and water systems. This area of work builds on research on norms (GENNOVATE, the Initiative on Gender Equality), inclusive policies and governance (WEAGov), and securing women's land and resource rights (WLR).
- **Empowerment:** Research on how unequal power relations impact women's and young people's ability to make strategic and practical life choices and on solutions and measurements that can contribute to empowerment (WEAI, WEFI, WELI). This

area of work builds on research on strengthening women's individual and collective agency and voice across CGIAR.

- **Resources and technology:** Gender-responsive programs and novel strategies to increase access to and use of technologies as well as control over and management of resources for women, youth, and other groups that are dependent on food, land, and water systems. This research builds, for instance, on past achievements in developing socio-technical bundles across CGIAR and on testing social protection modalities for empowerment under the Gender Equality Initiative.

The Accelerator will use a whole-of-society approach and cutting-edge research methodologies that are gender responsive and transformative as well as intersectional. Emerging research areas include investigating the compounding effects of inequalities within the global poly-crises, ensuring digital and financial inclusion (jointly with the Accelerator on Digital Transformation), using an intersectionality framework to enrich gender analyses, and expanding research on youth and marginalized groups (e.g., persons with disabilities and Indigenous Peoples).

Aligning with partners' needs and demand

The Accelerator on Gender Equality and Inclusion responds to national and global demands expressed through longstanding partnerships, policy documents, CGIAR Listening Sessions, and bodies such as the Commission on the Status of Women. All of these call for improving women's productive capacity and control over resources, including income, and for strengthening their resilience to achieve equitable outcomes. The Accelerator's focus on capacity strengthening draws on diverse stakeholders to apply and improve GESI knowledge and competences.

The Accelerator is committed to building and deepening equitable partnerships. It will continue to convene one of the world's largest networks of gender-in-agri-food-systems researchers and experts, from within and beyond CGIAR. Local partnerships with governments, NARES, NGOs, community associations, and private-sector actors will drive implementation and sustainability. The Accelerator will build on existing relationships with regional and multilateral institutions to influence international policy, programming, and large-scale investments. These partnerships will strengthen CGIAR's work on assessing needs; fuel collaboration on design, implementation, and monitoring and evaluation; and provide critical feedback on the gendered and intersectional impacts of the technologies and approaches developed by CGIAR and its partners.

Linkages with the wider CGIAR Portfolio

Indicative examples of areas of joint work with Programs include the following:

- Advancing inclusive and gender-transformative climate action with the Program on Climate Action.
- Understanding empowerment and gender equality in the face of compounded crises in fragile settings with the Program on Food Frontiers and Security.
- Developing gender-intentional technology and institutional innovations in genetic innovation, agronomy, landscape, and aquatic food and livestock systems with the corresponding Programs. The Accelerator will continue to work with each Center's gender teams and build on the CGIAR network of Gender Research Coordinators' work.

Based on the experience of the GENDER Impact Area Platform and its recent evaluation, the Accelerator may advise CGIAR management on Portfolio strategy and management following the recent GENDER Impact Area Platform evaluation recommendation to "actively invite and involve GENDER in CGIAR's decision-making processes, to inform critical decision-making points."

Cassava Breeding Workshop on new concepts and best practices, and hands-on training on breeding tools. Credit: Juan Pablo Marin Garcia / CIAT

Accelerator on Shared Capacity

Mega challenges and opportunities

To achieve a world without hunger, poverty, or environmental degradation in a context of increasing risk and uncertainty requires an all-hands-on-deck approach in which governments and organizations from the Global North and South work collaboratively toward common goals. However, disparities in capacity to tackle some of the greatest challenges affecting food, land, and water systems might hinder meaningful and timely progress. These differences in capability are due, in part, to the pervasive North-South divide in access to high-quality, actionable capacity development opportunities for individuals, institutions, and innovation systems, as well as to the loss of capacity in low- and middle-income countries due to systemic challenges related to talent absorption and retention.

Sharing knowledge, insights, and capabilities across stakeholders from all global regions can increase global capacity and result in improved, culturally appropriate, and more sustainable interventions, as well as talent retention. The Accelerator on Shared Capacity aims to enhance the capabilities of partners and CGIAR to jointly drive transformational change. The Accelerator will (1) guide and support the co-delivery of training and educational opportunities, (2) facilitate South-South and triangular learning and cooperation, and (3) support greater research, policy, and scaling engagement between partners and CGIAR by employing a learning-by-doing approach that aims to enhance and build sustainable capacity.

Contribution to CGIAR's impact

The CGIAR and Center-specific 2030 strategies for research and innovation identify capacity development as a critical impact pathway to undertake and scale research and innovation and accelerate global progress toward the Sustainable Development Goals (SDGs). This Accelerator operationalizes this impact pathway by collaborating with and supporting partners in low- and middle-income countries to enhance and acquire the necessary capacity to accelerate and deliver high-impact research and evidence-based solutions and innovations for food, land, and water systems transformation alongside CGIAR.

To achieve this, the Accelerator will broaden its engagement with national research and innovation systems, thus working more purposefully and strategically with ministries and their relevant agencies (in both the agricultural sector and other sectors such as water, energy, environment, health, education, and finance), academic and vocational institutions, research centers, private-sector entities, community-based organizations, and civil society actors in devising tailored interventions that address capacity development needs. The expected outcomes of the Accelerator include improved technical, analytical, dissemination, and management capacity for partners and CGIAR staff, including early, mid-career, and senior researchers. By embracing a novel approach to capacity development that is based on mutual learning and the sharing of evidence, innovations, and technologies, the Accelerator will also contribute to healthier and more equitable partnerships. In addition, it aims to catalyze greater investments in research for development by showcasing the impact of enhanced partner capacity.

Scope of work

The Accelerator's key areas of work include the following:

- Creating structured, locally relevant, and demand-driven spaces for co-learning and technology transfer through educational, knowledge sharing, and skills enhancement programs. This includes PhD and post-doctoral fellowships, mentorships, exchange programs, and secondments as well as leadership and soft skills development.
- Research, scaling, and policy engagement in which partners develop capacity by leading or collaborating in efforts that meet national or regional priorities and contribute to jointly defined impact outcomes with CGIAR Programs, Centers, and other relevant partners.
- South-South and triangular cooperation initiatives.
- Monitoring, evaluation, learning, and impact assessment of capacity-sharing approaches, models, and outcomes. The Accelerator will play a coordination role and co-invest in capacity development opportunities with other Programs and partners. Of strategic importance will be to establish a risk monitoring mechanism for potential brain drain from low- and middle-income countries by co-creating with partners talent capacity retention programs such as career development opportunities and research engagement grants.

Aligning with partners' needs and demand

Consultations with partners across the world, including those conducted recently through CGIAR's Listening Sessions and a capacity development stocktake and benchmark study commissioned by CGIAR's CapSha Task Force, consistently show a high demand from stakeholders for capacity development and sharing.

The Accelerator will employ a variety of tools and approaches to ensure that its efforts meet the needs of partners and CGIAR. This will include a systematic approach for keeping a pulse on partner capacity demands, relying on networks of key informants, regular surveys, and analyses of national and regional emerging trends, in close cooperation and coordination with the Program on Scaling for Impact, CGIAR Country Convenors, and Centers.

The primary beneficiaries of the Accelerator's work will be partners from low- and middle-income countries. At the individual level, special consideration will be given to women and young researchers. At the institutional level, the Accelerator will focus on NARES, albeit not exclusively. At the innovation systems level, efforts will be directed toward enhancing coordination, collaboration, and impact delivery by partners, including research and academia, the private sector, civil society organizations, and NARES. Given the Accelerator's focus on co-development, co-learning, and sharing of experiences and skills development with peers and partners from around the world, CGIAR researchers will also benefit.

Linkages with the wider CGIAR Portfolio

The Accelerator will maximize the value of capacity-sharing efforts of CGIAR Centers, Programs, and partners by

- Mapping, guiding, and matching capacity-sharing offer and demand.
- Bringing together the leaders of capacity development programs into a community of practice in which opportunities for collaboration can be openly explored.
- Creating a space where different models for capacity sharing are examined; lessons garnered, systematized, and shared; and standards for capacity-sharing activities collectively defined, including with partners.
- Providing a System-wide entry point to partners for capacity-sharing activities and opportunities offered throughout the organization.
- Developing collaboratively new capacity-sharing opportunities where gaps are identified.

Accelerating equitable transformation of food, land, and water systems through digital innovations, data-driven insights, and impactful ventures: Accelerator on Digital Transformation

Mega challenges and opportunities

Innovative digital technologies, advanced analytics, and high-quality, timely research data are crucial to transforming food, land, and water systems, thus effectively addressing complex and dynamic challenges such as climate change and food insecurity. The Accelerator on Digital Transformation accelerates this transformation by integrating data flows across research domains, applying emerging tools and methodologies, and providing advanced digital and data infrastructure. These efforts foster collaborative solutions that deliver compelling value propositions for all Programs and stakeholders, empowering them with cutting-edge digital tools, data-driven insights, and entrepreneurial strategies to help them address their main challenges effectively.

This Accelerator will broaden access to the benefits of the data revolution (scientific and technological advances), thereby advancing CGIAR's mission at scale. Further, it will position CGIAR as a leader in the ethical use of AI and other emerging digital technologies. This Accelerator will enable CGIAR to leverage its comparative advantages – extensive research capability, quality data assets, trusted neutrality, and commitment to responsible innovation, gender equality, and social inclusion – to develop and implement research-based solutions that are both transformative and equitable.

Contribution to CGIAR's impact

The Accelerator on Digital Transformation will provide researchers, technology innovators, investors, policymakers, and producer-facing organizations with access to standardized, validated, and contextualized data and system modeling approaches – developed in collaboration with Programs. This will enhance their understanding of the complex dynamics and trade-offs between priorities among the five CGIAR Impact Areas, enable timely analysis and prediction of potential risks, and facilitate the development of demand-aligned, effective risk management strategies. With this approach, the Accelerator on Digital Transformation will enable these groups to assess new digital opportunities and co-create solutions to effectively address their unique challenges. It will also strengthen the digital ecosystem through public-private partnerships, thus accelerating the development of tailored, timely, affordable, inclusive, and multichannel solutions.

Through the commitment to digital innovation, capacity building, and impactful partnerships, the Accelerator will catalyze the delivery of solutions that empower producers, natural resource users, consumers, and other stakeholders with actionable insights, thus enabling them to have a stronger voice in innovation, markets, and decisions about investments and policies. In this way, the Accelerator will help to achieve the outcomes outlined in the CGIAR theory of change and the SDGs.

Scope of work

Underpinned by CGIAR's commitment to findable, accessible, interoperable, reproducible (FAIR) data principles, open science, responsible innovation, and equal partnerships, the Digital and Data Accelerator will be structured around the following five pillars of work:

- **Leading the digital research agenda:** The Accelerator will provide thought leadership on issues surrounding digital technologies and assessing the potential of new technological frontiers. In coordination with the Programs, it will leverage innovation systems and participatory research approaches to identify strategic entry points for systems transformation and establish platforms to share knowledge and collaborate. Beyond research, it will translate digital thought leadership into best practices in product design and innovation processes and guide Programs in developing inclusive digital products, services, and businesses. Drawing on domain expertise, it will ensure that CGIAR is a lead contributor to global dialogues on the ethical use of AI and related technologies.
- **Harnessing frontier technologies:** Through the discovery, design, piloting, and evaluation of AI and digital solutions, the Accelerator will apply new technologies and generate case studies that leverage digital technologies to develop new research methods and deliver outcomes and impacts. In coordination with the Programs, the Accelerator on Digital Transformation will identify key technological opportunities for transformative changes in food, land, and water systems and facilitate collaboration and capacity sharing, while addressing identified gaps in data, knowledge, and technical capacity.
- **Unlocking the power of data innovation:** A reliable, comprehensive, and accessible source of interoperable data assets will accelerate innovation. The Accelerator will standardize and enrich data from various sources, including fields, satellites, audio, images, sensors, crowdsourced information, and other high-frequency, real-time data streams. It will enhance data governance, build data management capacity, and foster culture change in data ecosystems that adhere to the FAIR principles, ensuring that data are machine-usable and AI-ready.
- **Providing enabling digital infrastructure for research:** To enable the previous three pillars, CGIAR needs a secure and scalable digital core infrastructure for research. The Accelerator will lead its design, provision, and management, focusing on agility to remain future-proof, optimizing resources for cost-effectiveness, and enhancing governance to ensure sustainability. This infrastructure will facilitate collaboration across the Programs, thus accelerating the transition from research pilots to practical applications.
- **Launching the Digital and Data Innovation Accelerator hub:** The Accelerator will establish a hub for CGIAR and its partners to unlock the potential of technological frontiers such as generative AI and quantum computing. This hub will serve as a center of excellence, bringing together CGIAR researchers, partner organizations, and tech innovators to jointly address new challenges. It will also establish a new collaboration model for replication in other contexts.

Aligning with partners' needs and demand

These five areas of work will define engagement by the Accelerator on Digital Transformation with growing demands from countries, regions, and partners for the responsible, inclusive, and sustainable use of digital technologies and the provision of digital public goods. The five areas of work and associated research agenda will build on relevant bilateral projects and the achievements of the Digital Innovation, Excellence in Agronomy, and Genetic Innovation Initiatives in digital and data science applications related to food, water, and land systems that aim to leverage and assess the potential of new digital technologies, especially AI and generative AI approaches.

Linkages with the wider CGIAR Portfolio

The Accelerator on Digital Transformation will accelerate CGIAR's three impact pathways –Innovations, Policy, and Capacity Sharing. It will collaborate with all Programs to enhance digital and data capacity development, facilitate access to enabling digital infrastructure and shared services, and provide insights into the rapidly evolving AI and digital landscape. As the Accelerator shares with the Program on Scaling for Impact the mission of identifying and scaling out innovations, strategic two-way collaboration will take place between the programs to catalyze the development of a vibrant, entrepreneurial digital ecosystem based on digital and data assets produced by CGIAR and its partners. Collaboration with the Programs on Climate Action, Multifunctional Landscapes, Breeding for Tomorrow, Sustainable Farming, and Sustainable Animal and Aquatic Foods, for example, will support the development of fully integrated, automated, and effective digital workflows that enhance demand-led genetic innovation, improve production practices, support regenerative agriculture, manage natural resources, mitigate climate risks, and support extension services. In addition, in partnership with the Programs on Policy Innovation, Better Nutrition, and Food Frontiers and Security, the Accelerator on Digital Transformation will use innovative system dynamics modeling approaches that leverage AI and data linkage to inform policy, investment, and business decisions.

Conserving, exchanging, and using plant diversity: Genebanks

Mega challenges and opportunities

As part of its Zero Hunger goal, the UN has set a target for the genetic diversity of crops to be maintained and made accessible from soundly managed genebanks. CGIAR has a unique global role in achieving this target as the custodian of some of the world's most diverse collections and as a point of exchange of clean source material through its germplasm health units (GHUs). CGIAR genebanks and GHUs, strategically located in diversity hotspots, provide genetic variation across 3,000 plant species to researchers, breeding teams, extension programs, local communities, and farmers around the world, helping them to address existing and emerging challenges on local to global scales and to explore options for a more resilient, diverse, and environmentally sound agriculture and landscape.

Frontier technologies and innovations in genomics, phenomics, artificial intelligence, and cryopreservation are enhancing the relevance of genebanks, placing our generation in a position of responsibility to explore and use genetic diversity more effectively and on a much wider scale than previously toward reversing the narrowing of the base upon which food security and diets now precariously rest.

CGIAR genebanks have the internationally acknowledged capacity and expertise to conserve plant diversity for the long term. The collections date back more than half a century and comprise about 50 major staples, regionally important crops, and a wide range of wild species and trees. On a daily basis, users worldwide ranging from farmers to advanced research institutes are assisted in selecting and ordering germplasm of traditional landraces, wild species, and other materials that is hard or impossible to obtain from other sources. In addition, through partnerships and capacity building, CGIAR aims to fulfill a global role in helping to revitalize genetic resource communities worldwide and to secure, characterize, and exchange crop diversity globally.

Contribution to CGIAR's impact

CGIAR genebanks conserve unique biodiversity held in trust on behalf of the global community, directly contributing to CGIAR's Collective Target 11, UN Sustainable Development Goal 2.5, and Kunming-Montreal Global Biodiversity Framework Targets 4, 10, 13, and 20. CGIAR genebanks and GHUs together facilitate access to crop diversity by increasing numbers of breeders, researchers, and diverse communities through identifying materials corresponding ever more precisely to their needs. The accelerated use of these resources by a wider range of actors will lead to widespread impacts on increased diversity, nutritional security, food security, income, environmental health, and capacity to adapt to climate change and other challenges.

Scope of work

Key areas of work will include the following:

- **Biodiversity conservation:** CGIAR genebanks sustain international standards of operation to conserve and make available the diversity of wild and cultivated plants. Working in communities of practice (CoP), they continuously improve and harmonize processes for seed quality management, cryopreservation, automation, data management, and seed phenotyping, and seek opportunities for increased cost-efficiency, including by diminishing excessive redundancy. Individual genebanks collaborate with national partners and local communities to facilitate a two-way flow of diversity between countries and between farmers and researchers. They help provide a global overview of the conservation status of crop genepools and provide immediate access to germplasm, thus preventing genetic erosion.
- **Proactively helping users obtain germplasm:** CGIAR genebanks characterize the genetic diversity of collections and co-develop online portals, digital tools, and germplasm subsets together with partners and users to continuously improve the accuracy of accession information and the genebank user's experience. Genebank scientists will deepen partnerships to enrich accession data relevant to nutritional traits and climate adaptation and mitigation and help leverage funding for targeted screening and evaluation of collections.
- **Phytosanitary health:** CGIAR GHUs enable the safe distribution of germplasm and other bioresources, prevent the spread of pests and diseases between countries and regions, and ensure that CGIAR Centers comply with international phytosanitary standards. Working as a community, GHUs harmonize phytosanitary services, standardize procedures and data management, and optimize methods to diagnose and eradicate quarantine threats. They continue to forge strong partnerships with national plant protection organizations to enhance their capacity to control evolving pests and diseases.
- **Access and benefit sharing:** The Genebanks policy team leads CGIAR's engagement in international negotiations to develop new access and benefit-sharing laws and regulations, which impact how genetic resources and digital sequence information can be exchanged and used in research and development and how benefits flow to low- and middle-income countries. The Genebanks policy team compiles evidence to help negotiators make informed decisions about new rules and provides CGIAR scientists with technical backup to comply with complex and rapidly evolving legal obligations and ethical standards.
- **Global-level role:** CGIAR genebanks, GHUs, and the policy team enhance the worldwide capacity in conserving and safely exchanging plant diversity by strengthening the global community of genebanks, phytosanitary agencies, and the enabling policy environment that surrounds them. Extending CoP to NARES partners and fostering regional approaches to capacity sharing as well as providing online courses and resources for young researchers will enhance collaboration and coordination in the conservation and use of crop diversity, thus helping to build the global system that is repeatedly called for by the international community.

Aligning with partners' needs and demand

CGIAR genebanks have a legal responsibility, under the Plant Treaty, to conserve and make genetic resources held in trust available now and for future generations. The demand for germplasm from CGIAR genebanks is reflected in the numbers of annual requests and distributions, which exceeded 200,000 samples to more than 60 countries in 2023 alone. In addition, established international channels provide direct information on countries' needs. The 151 contracting parties to the Plant Treaty and 179 members of the FAO Commission on Genetic Resources for Food and Agriculture communicate priorities in the rolling *Global Plan of Action*, editions of the *State of the World's PGRFA*, and other documents.

Linkages with the wider CGIAR Portfolio

CGIAR genebanks, GHUs, and the policy team interact with all Programs that are working on genetic resources and biodiversity. There is a particularly close linkage with the Program on Breeding for Tomorrow in trait discovery and the adoption of services and quality management approaches relevant to both genebanks and breeding resources. Close linkages also exist with the Programs that are facilitating the use of forages, trees, and other crop diversity directly in farmers' fields to build more resilient and diverse agricultural systems in the face of climate change, as well as with areas of research to monitor and address the spread of crop pests and diseases. These include the Programs on Breeding for Tomorrow, Sustainable Farming, Multifunctional Landscapes, and Sustainable Animal and Aquatic Foods.

With science we can

Front cover photos

Credit:
Background landscape (Jacquelyn Turner/CCAFS)
Floating market in Thailand
Farmer working on an irrigation project in Ethiopia (Mulugeta Ayene/WLE)
Scientist in a rice field trial in Colombia (Neil Palmer/CIAT)

CGIAR