



CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources and ecosystem services. Its research is carried out by 15 CGIAR Centers in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector.

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ONE CGIAR



RESEARCH
STRATEGY
2030

*Ending hunger by 2030 –
through science to transform
food, land and water systems
in a climate crisis*

Prepared by the CGIAR Transition Advisory Group (TAG) 2 – Research

Co-conveners Martin Kropff and Mellissa Wood
Co-stewards Sonja Vermeulen and Maya Rajasekharan
Members Ali Abousabaa, Michel Bernhardt, Robert Bertram, Guy Faure, Bernard Hubert, Carol Kramer-Leblanc, Matthew Morell, Robert Nasi, Yvonne Pinto, Claudia Sadoff, Yohan Swinnen, Allan Tollervey, Wijnand Van Ijssel, Barbara Wells, Elwyn Grainger-Jones, Holger Meinke, Oscar Ortiz, Michael Phillips
Support team Ekaterina Krivonos, Ezekannagha Oluchi, Isabelle Osman

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Acronyms

A4RD	Agricultural Research for Development
CRP	Center Research Program
CWANA	Central & West Asia & North Africa
DRC	Democratic Republic of the Congo
ESA	East & Southern Africa
GHG	Greenhouse Gas
GO	Government Organization
IATI	International Aid Transparency Initiative
IPCC	Intergovernmental Panel on Climate Change
ISDC	Independent Science for Development Council
LAC	Latin America & the Caribbean
M&E	Monitoring and Evaluating
NARES	National Agricultural Research and Extension Services
NGO	Non-Governmental Organization
SA	South Asia
SDG	Sustainable Development Goals
SEA	Southeast Asia & the Pacific
SME	Small & Medium Enterprises
TAG	Transition Advisory Group
TCF	Transition Consultative Forum
TPMU	Transition Program Management Unit
UNFCCC	United Nations Framework Convention on Climate Change
WCA	West & Central Africa

Foreword

Pending text

[From the Chair of the One CGIAR Board]

Executive summary

This CGIAR 2030 Research Strategy presents the strategic directions that will guide CGIAR's research for development over the next 10 years. The strategy situates CGIAR in the evolving global context to address interconnected global and regional challenges that require it to embrace a systems transformation approach for food, land and water systems. It builds on the track record of delivering impacts over 50 years, lifting millions of people out of hunger and poverty and benefiting both producers and consumers across the world. It involves greater strategic clarity on where CGIAR lies in the development landscape: not as a development agency that provides direct at-scale project delivery directly to end users; but rather through research in partnership with development partners, national agricultural research and extension services (NARES) and the private sector to have impact at scale.

To achieve the One CGIAR mission – Ending hunger by 2030 through science to transform food, land and water systems in a climate crisis – CGIAR will produce solutions and innovations to deliver multiple benefits and transformative change across five SDG-focused global challenges: (i) Nutrition & food security; (ii) Poverty reduction, livelihoods & jobs; (iii) Gender equality, youth & social inclusion; (iv) Climate adaptation & greenhouse gas reduction; and (v) Environmental health & biodiversity. This will be achieved through integrated systems thinking, interdisciplinary approaches, innovative knowledge and technology development, careful analysis of synergies and trade-offs, and positioning of research within wider partnerships for change.

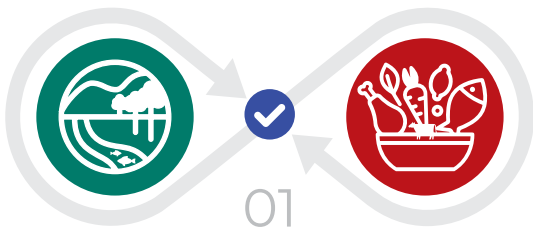
For six regions in the world, this strategy outlines regional priority challenges that reflect their global significance in terms of achieving SDGs and their regional relevance. CGIAR's main pathways from research to impacts to address these challenges involve science-based innovations, targeted capacity development, strategic partnerships, and policy-relevant analysis. One CGIAR's performance and results management system will track progress towards impact across these five equally important areas, at both global and regional level.

This strategy includes 10 key strategy directions that collectively will add up to a major progression in the way that CGIAR will do research to maximize pathways for research to impact at scale:

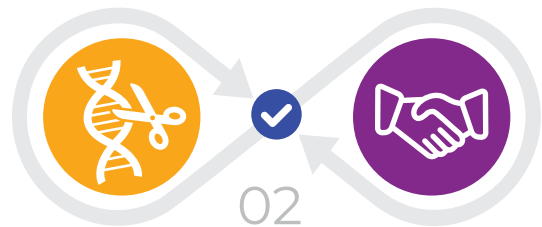
- ✓ Embrace a **systems-transformation approach** for food, land and water systems.
- ✓ Embed **demand-responsive** research within ambitious **research for development partnerships**.
- ✓ Target **risk-management and resilience** in the face of the climate crisis and other shocks.
- ✓ Pursue **multiple benefits** across five SDG-focused global challenges.
- ✓ Position **regions, countries and landscapes** as key dimensions of delivery.
- ✓ Deepen our engagement with the **private sector**.
- ✓ Generate scientific evidence on **multiple transformation pathways**.
- ✓ Make the **digitization transformation** central to our business model
- ✓ Create delivery mechanisms for research that guarantee **greater focus**.
- ✓ Build a shared portfolio of research based on **pooled funding**.



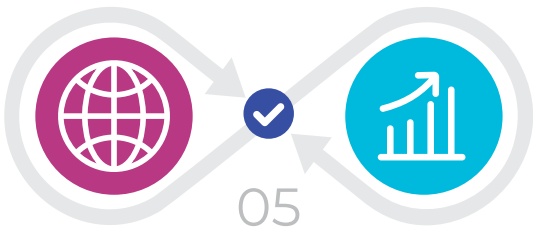
A new paradigm:



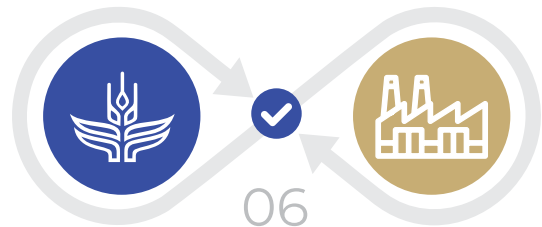
Embrace a **systems-transformation approach** for food, land and water systems



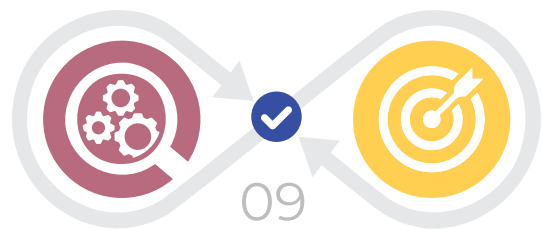
Embed **demand-responsive** research within ambitious **research for development partnerships**



Position **regions, countries and landscapes** as key dimensions of delivery



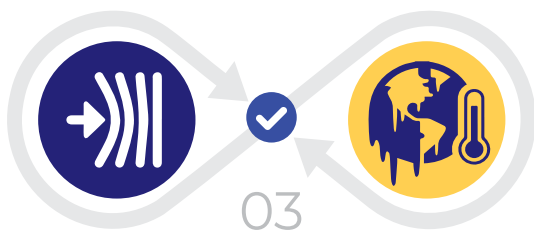
Deepen our engagement with the **private sector**



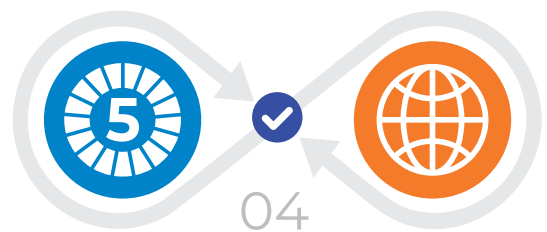
Create delivery mechanisms for research that guarantee **greater focus**

Strategic directions for 2022-2030

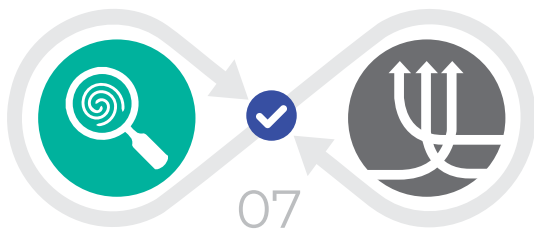
A package of 10 key strategy directions will collectively add up to a major progression in the way that CGIAR will do research and maximize pathways for research to impact at scale:



Target **risk-management and resilience** in the face of the climate crisis and other shocks



Pursue **multiple benefits** across five SDG-focused global challenges



Generate scientific evidence on **multiple transformation pathways**



Make the **digitization transformation** central to our business model



Build a shared portfolio of research based on **pooled funding**



All pictures are just placeholders





PART 1

CGIAR at 50: a new paradigm

©ONE CGIAR

Food, land and water systems need profound transformation – one in which CGIAR must play a central role. Global changes have become more rapid and more interconnected than our institutions' abilities to respond: climatic shocks, environmental decline, technological innovation, and profound global shifts in the main locations of demographic expansion, economic growth and geopolitical power.

A new strategy to address new challenges

Food – the ways we grow, catch, transport, process, trade, and consume it – is a central driver of the main challenges facing humanity. Most of the world's population eats too little, too much, or the wrong combination of food – at an unsustainable cost to our health, climate, environment and economy.

What's more, the global food system is creating and multiplying risks, and faces increasing uncertainty itself from these risks – particularly as we head further into a climate crisis that is taking the world into an uncharted future. COVID19 is a fire drill for food system shocks under the climate crisis. Under resource scarcity and global connectivity, the challenges of food and nutrition security, poverty reduction, gender equality, climate and environment are simply not separable.

Yet it is entirely possible to change the trajectory of our food, land and water systems. We find ourselves with an unprecedented opportunity for humanity to 'build back better' from COVID19 by transforming food, land and water systems that are at the root of the pandemic and the climate and other crises.

For the last 50 years, CGIAR has been contributing critical science to support food security and the development of successful and inclusive agricultural economies. But CGIAR's original mission – to solve hunger – must now address wider 21st century challenges as well and embrace a systems-transformation approach for food, land and water systems to deliver broad access to affordable, sufficient healthy diets and decent employment within environmental limits.

Today's context requires a refreshed research for development offer from CGIAR that generates solutions of global significance and regional relevance, working through major partnerships for transformation. One CGIAR – the consolidation of CGIAR's partnerships, knowledge and physical assets for a new era of interconnected research towards the SDGs – provides the opportunity for a fresh ten-year strategy that can shape a stronger and more relevant science agenda for today's world of change.

CGIAR's TRACK RECORD

Evidence shows that past investment in research and development conducted jointly by CGIAR with partners have yielded very high returns. Contributions of CGIAR breeding, agronomic practices, policy change, improving nutrition, natural resource management and climate change responses have resulted in a 10-fold return on investment (a benefit-cost ratio of 10:1).

As an example of the depth and breadth of CGIAR impact, take the world's most highly eaten crops: rice, wheat and maize. For rice, germplasm developed by CGIAR's accounts for 35% of the global market share, including 12% of rice in China, 42% in India, over 70% across SE Asia and 60% in Latin America & the Caribbean. For wheat, a 60:1 return on investment comes from CGIAR research on higher yielding varieties with more stable yield, improved disease resistance, better agronomic practices and policies that foster sustainable production. For maize, 60 % of maize variety releases in sub-Saharan Africa between 1995-2015 were based on CGIAR germplasm, and increased production of maize due to adoption of CGIAR varieties valued at over a billion US dollar per year.

More than 90 % of all germplasm exchanged internationally by contracting parties of the International Treaty of Plant Genetic Resources for Food and Agriculture are distributed by CGIAR.

CGIAR has a global presence across four continents with a collective human capital of 10,000 staff members, who are on the ground where the greatest challenges for food, land and water systems' contributions to SDGs exist.

10 strategic directions for CGIAR

01

Embrace a **systems-transformation approach** (Figure 1), seeking better understanding of food, land and water systems and their synergies, and key entry points and change mechanisms for transformation.

For food systems, this means designing research and engagement to meet the nutritional needs and demands of both urban and rural consumers, considering how their access to healthy diets is mediated through agriculture, food industries and the public sector. For land systems, it means research in the context of major pathways for global and regional land use – as more space is needed for biodiversity and carbon storage, necessitating zero deforestation plus more intensive use of current pastures and croplands. For water systems, it means research done with awareness of the myriad competing uses of freshwater and marine systems – both within and beyond food production. CGIAR will use systems-level knowledge to prioritize best-bet innovations and assess trade-offs and synergies, and increase the use of foresight to improve relevance and uptake of research.

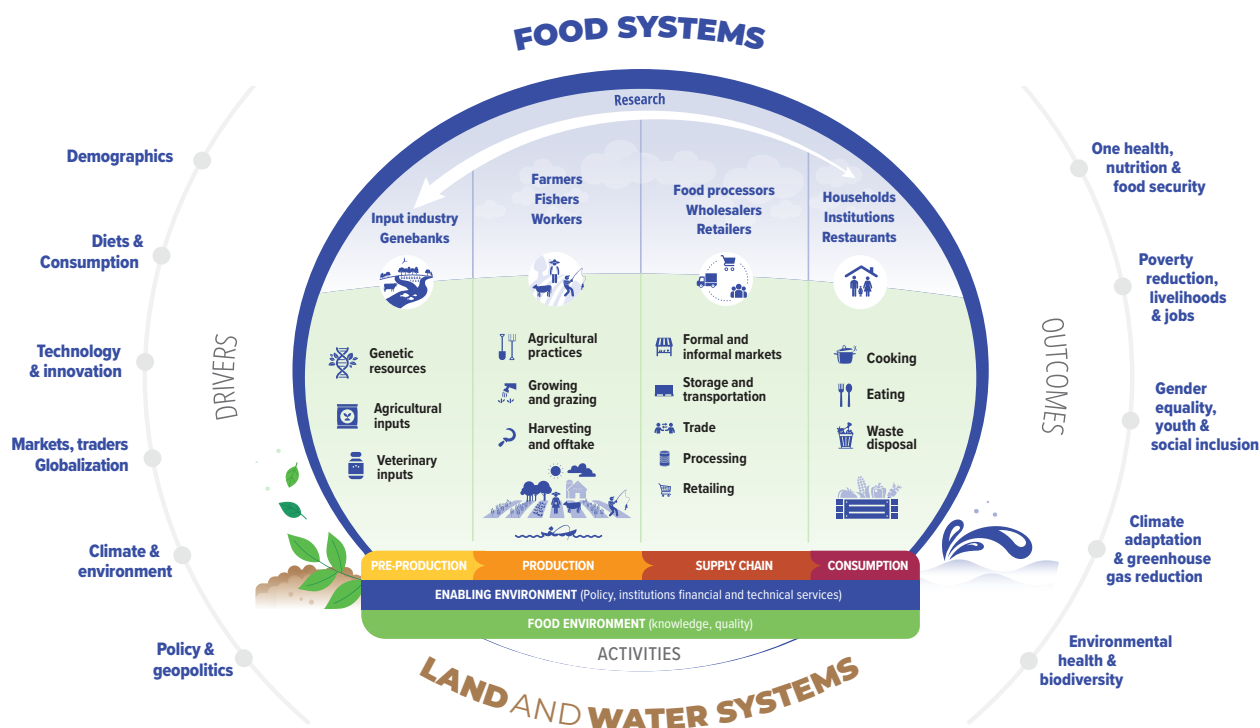


Figure 1. CGIAR will support transformation across food, land and water systems.



Embed **demand-responsive** research within **ambitious research for development partnerships** in which CGIAR is strategically positioned within broader transformation agendas towards the SDGs, involving key partners from national to global levels.

CGIAR will work with partners before, during and after research, to ensure that all activities in science, capacity development and policy work are designed to respond to partners' needs, and are delivered in ways that accelerate specific opportunities for uptake and use. Matching partnerships to the challenge, with greater diversity in the range of research and scaling partners – many beyond the agriculture sector – will be key to addressing wider systems transformation ambitions. This involves greater strategic clarity on where CGIAR lies in the development landscape – that the primary focus is translational research that links foundational research with on-the-ground implementation. We are not a traditional development agency occupied with direct at-scale project delivery directly to end users; instead we work with development partners, NARES and the private sector to have impact at scale.



Target **risk-management and resilience** as critical qualities for food, land and water systems in a world where the climate crisis and Covid19 demonstrate that rapid change, shocks and tipping points are the new normal.

CGIAR will internalize climate change as the over-arching challenge for the coming decade – with research, capacity building and stakeholder engagement that explores multiple possible futures, maps major pathways for change, and build resilience by developing solutions that are robust across multiple scenarios and contexts.



Pursue **multiple benefits** as standard practice in all our work, by aiming for net positive impact across five SDG-focused global challenges:

Nutrition & food security; poverty reduction, livelihoods & jobs; gender equality, youth & social inclusion; climate adaptation & greenhouse gas reduction; environmental health & biodiversity. The food system is replete with unmet opportunities for multiple-win changes to policies, practices and technologies. Pursuing these outcomes collectively rather than on separate tracks will often come through more interdisciplinary and transdisciplinary approaches – and will inevitably takes us beyond the farm-gate into a broader set of challenges in landscapes and food systems.



Position **regions, countries and landscapes** as key dimensions of delivery – as the source of demand, and as the location of co-design and co-delivery of innovation, capacity development and policy change with partners.

CGIAR will position itself in selected geographies and landscapes, embedded in strategic partnerships, to develop and scale up coherent and compatible solutions. Coordination across CGIAR will provide an integrated offer and a single point of entry for partners at country and regional levels, nurturing strong partnerships and presence, and building shared accountability towards national and regional development goals.



Deepen our engagement with the **private sector** – not only a one-way channel for scaling technologies, but in assessing demand and product design.

This engagement recognizes farmers as private sector constituents, and works across small, medium and large enterprises. A business focus to our work is essential to hard-wire end-user uptake of innovations, working with private sector and policy makers to bridge the gap from innovation to uptake, with systematic use of tools such as market research, capacity development, product profiles and stage-gated research management.



Generate scientific evidence on **multiple transformation pathways** that are appropriate to different contexts.

Both sustainable intensification pathways and agro-ecological pathways will be part of CGIAR research. These pathways are not separate; they often converge and overlap due to the huge diversity of agriculture, land, water and food systems. As there is ‘no one size fits all’, the challenge is to design transformation pathways to help stakeholders make decisions and manage trade-offs best adapted to their situation. CGIAR will contribute to the current and future debates regarding food, land and water system transformation with scientific knowledge on each pathway or a mix of pathways. This places CGIAR as a balanced and trusted research for development organization that provides evidence for the optimization of choices.



Make the **digitization transformation** involving artificial intelligence, machine learning and big data, central to our business model – both in implementation of scientific research,

using the best tools available, but also to engage through partners with digitally empowered end-users to support them in improving their own access to and use of innovations and knowledge. For example, CGIAR research can contribute to improved digital extension services at scale that in turn could transform small-scale farming, if combined with greater efforts to get devices and services to both women and men and to the least well served geographies and communities.



Create delivery mechanisms for research that guarantee **greater focus** in CGIAR’s contribution, including focusing funding on fewer and bigger challenges;

a new framework for managing research and its pathways to impact; new operational systems that enable research of both regional and global merit; a thoughtful and deliberate approach to managing partnerships and CGIAR’s role in the development landscape; scientific expertise that couples specialist and generalist aptitudes; a universal system for planning, resource allocation and reporting that includes stage-gates; and supportive structures and incentives for a mix of high-risk and low-risk innovation across the portfolio, providing flexibility to respond to arising shocks and crises in a strategic rather than purely ad hoc manner.



Build a shared portfolio of research for development based on **pooled funding**, with at least half of CGIAR’s overall research programming in this shared portfolio.

The shared portfolio, which will be programmed in investment plans aligned with each CGIAR 3-year business cycle, will ensure a stable critical mass for CGIAR Projects, achieve the levels of partnership required to scale impact, and attract the best minds to the challenges facing our food, land and water systems. Bilateral funding will also be important in delivering on the CGIAR mission, and wherever possible will be aligned with the shared portfolio and included in common reporting.

Science to impact framework: linking mission, delivery and research to regional and global challenges

The conceptual framework below (Figure 2) captures how CGIAR work will respond to both global and regional priorities and deliver through strategic channels to contribute to multiple benefits – on the ground and with global impact. CGIAR will further develop its scientific competencies and assets with new research and delivery partners and skills.

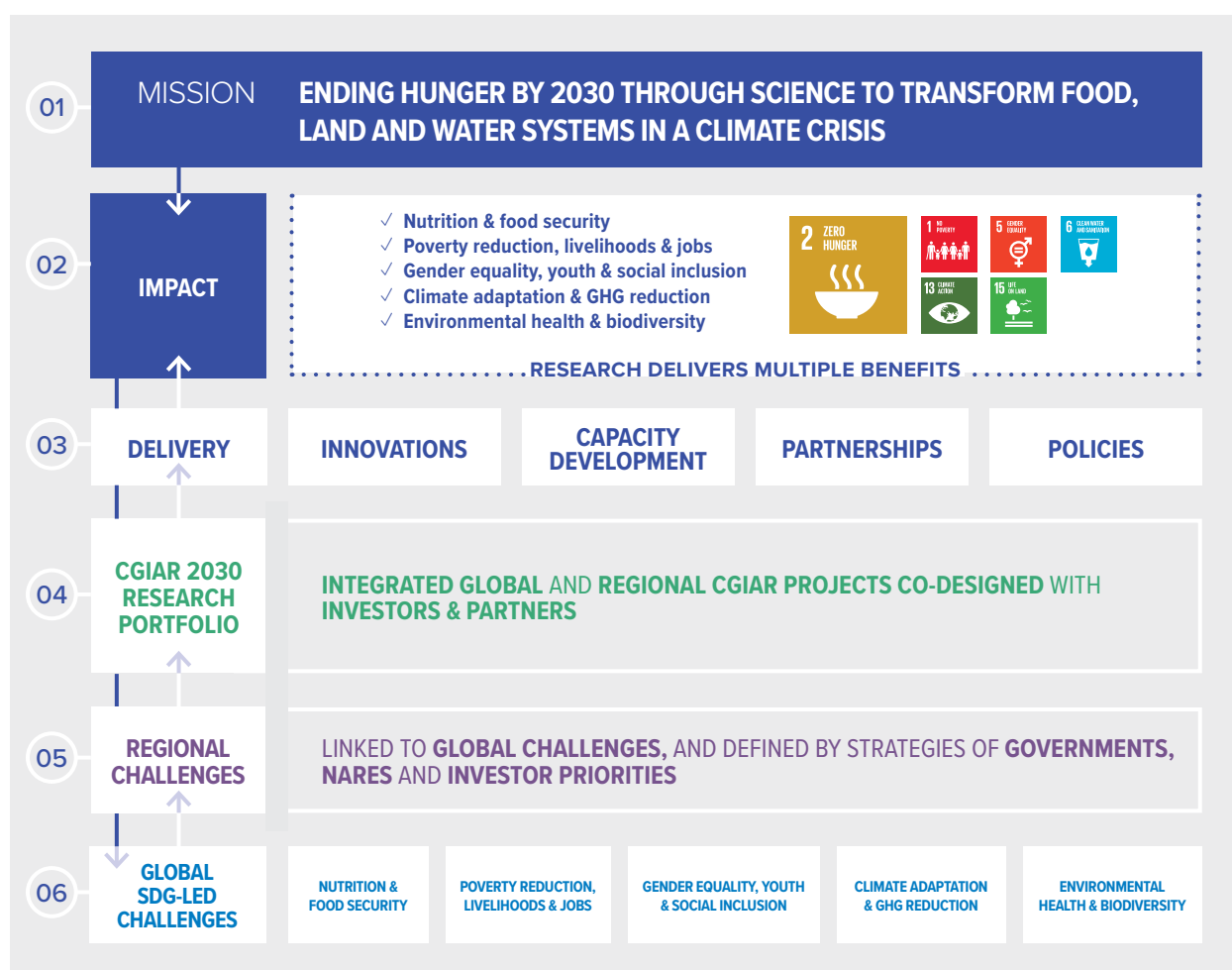


Figure 2. How CGIAR work will respond to both global and regional priorities and deliver through strategic channels to contribute to multiple benefits.

Working from the CGIAR mission through to the challenges that this mission addresses through research and delivery, there are six levels in the framework:

01 CGIAR's mission and vision

- **CGIAR mission:** Ending hunger [by 2030] – through science to transform food, land and water systems in a climate crisis.
- **CGIAR vision for 2030:** Aligned with the CGIAR mission, CGIAR's vision of success is sustainable

- food, land and water systems that deliver more
- diverse, healthy, sufficient and affordable diets,
- and ensure improved livelihoods and greater
- social equality, within planetary and local
- environmental boundaries.

02 Impacts across 5 global SDG-led challenges

- CGIAR will deliver relevant results into
- shared impact pathways to achieve system
- transformation and the SDGs. Each of the
- global challenges and impact areas maps
- closely against SDG2: Zero hunger, SDG1: No

poverty, SDG 5: Gender equality, SDG 6: Clean water and sanitation, SDG 13: Climate action, and SDG15: Life on land.

03 Delivery

CGIAR's main pathways from research to impact involve four routes for delivery:

- ✓ Science-based innovations – for example in technologies, breeds, data or institutional arrangements – that are co-developed with partners and end-users and scaled up and out with strategic delivery and scaling partners
- ✓ Targeted capacity development – working with individuals and organizations – ranging from training-of-trainers at the farmer level through to ongoing institutional support to national partners, particularly NARES peers, and technical advice to policy-makers at global level
- ✓ Strategic partnerships – to ensure that science responds to global and regional challenges and is used effectively in systems transformation
- ✓ Analysis relevant to new policies – including business strategies and development programs together with more formal public policy sector instruments – as a key pathway to change at scale

04 Research for development portfolio

The set of challenges that CGIAR will address on the basis of triangulated importance, demand and capacity – and the science that CGIAR brings to these challenges, based on clear timebound objectives and metrics of success, compelling theories of change, strategic partnerships and integrated approaches.

05 Regional challenges

Challenges of both global significance and regional relevance, for which there is demand for CGIAR contributions from CGIAR partners, stakeholders and investors.

06 Global SDG-led challenges

CGIAR will work towards meeting the vision and mission through global impact across five global challenges for which transformation of food, land and water systems is paramount for achieving the SDGs (Table 1). The challenges are interlinked. Therefore, CGIAR work will deliver multiple benefits across the five global challenges, aiming for net positive impact. This will be through integrated systems thinking, inter-disciplinary approaches, careful analysis of synergies and trade-offs, and positioning of research for development within wider partnerships for change.



All pictures are just placeholders

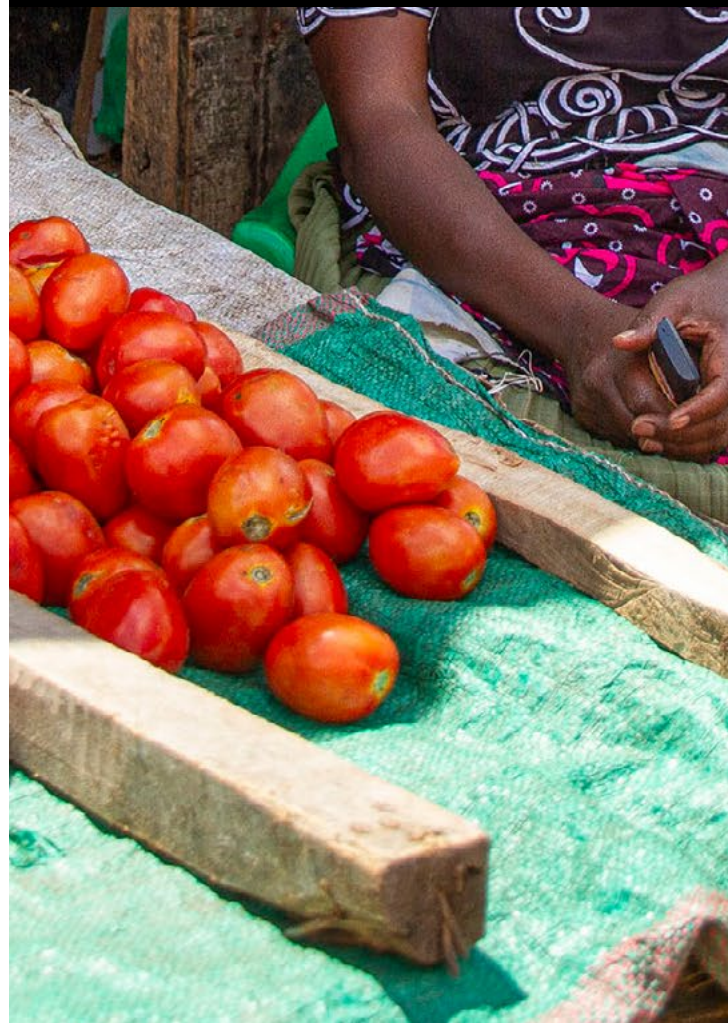


Table 1. Global SDG-led challenges for food, land and water systems

<h1>Global challenges</h1>	<h2>NUTRITION & FOOD SECURITY</h2> <p>Nearly 690 million people, 8.9% of the world population are hungry. If recent trends continue, the number of people affected by hunger will surpass 840 million by 2030.</p> <p>2 billion people do not have regular access to safe, nutritious and sufficient food, and diet-related non-communicable diseases (obesity, cardiovascular disease, cancer, and diabetes) increasing in all regions.</p>	<h2>POVERTY REDUCTION, LIVELIHOODS & JOBS</h2> <p>Over 10% of world population live on less than \$1.90 a day and 25% on less than US\$3.20 a day, making a healthy diet unaffordable to billions.</p> <p>Poverty is disproportionately concentrated in rural areas (three times as high as in urban areas), where agriculture is the predominant livelihood activity.</p> <p>The Covid19 crisis could push close to half a billion people back into poverty.</p>
 <h2>2030 CGIAR targets</h2>	 <h2>Deliver affordable healthy diets to 350 million people, ending hunger for 30-35 million</h2>	 <h2>Lift 30-35 million people above the US \$1.9 per day poverty line</h2>

GENDER EQUALITY, YOUTH & SOCIAL INCLUSION

More than 85% of the world's 1.2 billion youth live in low-income and middle-income countries, and many of them face limited opportunities for employment or entrepreneurship.

Women, on average, comprise 43% of the agricultural labor force in low-income and middle-income countries, and account for two-thirds of the world's 600 million poor livestock keepers, yet their access to productive resources and services is limited, holding back prosperity for all.



Improve income and wellbeing of 15-20 million women

Increase remunerative and decent employment and entrepreneurship opportunities for 10 million young women and men

CLIMATE ADAPTATION & GREENHOUSE GAS REDUCTION

Agriculture and food systems produce almost a third of global greenhouse gas emissions, yet agriculture could be a global carbon sink.

Climate-related disasters could displace 200 million people by 2050.

Projections at 2°C warming will result in an additional 540-590 million people undernourished globally by 2050.

Climate change poses major risk for agriculture and food production through high temperatures, erratic rainfall, drought, flooding and sea level rise.



Reduce greenhouse gas emissions from food and forest systems by 15% and inform and leverage climate smart agriculture investments for US\$ 50 billion

ENVIRONMENTAL HEALTH & BIODIVERSITY

A third of the world's soils are degraded. Agriculture accounts for about 70% of global water withdrawals.

Nitrogen cycles are transgressing planetary boundaries, driven by agriculture.

Agriculture is the biggest driver of forest and biodiversity loss – including of diversity crucial to food security.



Bring 30-50 million hectares area under ecologically and socially sustainable management

All pictures are just placeholders

CGIAR's dynamic comparative advantage to meet these challenges

To deliver science to meet today and tomorrow's challenges will need expertise across a set of forward-looking themes. CGIAR will provide some of these assets and skills – based on existing capacity and development of capacity in a few key areas – and will draw on partners to contribute their capacity where the fit is better. CGIAR will aim for the highest standards of scientific quality and rigor through its Independent Science for Development Council, research ethics policy, performance management processes, and commitment to peer review. Several key science domains as follows characterize CGIAR's current and evolving comparative advantage to support the above mission and vision:

01 Harnessing genetic diversity to nourish future generations

As global custodians of 760,467 accessions of priceless agro-biodiversity, CGIAR genebanks will advance the conservation and use of crops, trees and forages genetic resources and make these available to the global community. Using modern genomic technologies and informatics, research will focus on building an effective enabling environment and innovative approaches for strengthening links between ex-situ and in-situ conservation and use and related data, policy engagement and benefit sharing, seed laws and incentive mechanisms. Modernized breeding approaches will advance the selection of value-added traits and multiple benefit increases in genetic gains to deliver innovative breeding products to users in targeted regions. Plant, animal and fish breeding will use next-generation breeding techniques to develop varieties that farmers need to increase resilience to climate change, tolerance or resistance to diseases and pests, better and more diverse nutrition (e.g. through biofortified varieties), more attractive market traits, including those valued by women, and sustainable livelihoods. The breeding process will be accelerated by 25-50% through novel approaches in informatics, gene technology and artificial intelligence. CGIAR will accelerate the scaling out of new varieties and breeds into widespread use through innovative public-private partnerships to help develop strong seed, livestock and fishery systems that maximize farmer access.

02 Building sustainable and climate-resilient productive and profitable future farming systems

CGIAR research will support transformation of food production, focusing on innovations at farm and landscape level that enhance income and nutrition of food system actors, in particular women and youth. Important areas include diversification, sustainable intensification, agronomy, agro-ecology, agroforestry and biodiversity management, better understanding of the soil plant microbiome, above and below ground water management and regenerative agriculture. Research on sustainable intensification will focus on increasing efficiency of resource use (water, land, labour, and fertilizers), productivity gains (crop/livestock/fish/tree; land, water, labour) and management of emergent crop/livestock pests. Synergies among productivity, environmental benefits, and soil and plant microbiomes will be maximized using digital agriculture, remote sensing and decision support systems. Application of principles of circular economy and the water-energy-food nexus will be important to manage trade-offs, and mitigate negative environmental impacts of food production. Emphasis will also be on farmer access to and understanding of knowledge and advisory services, with a focus on equal access for women and men. To achieve systems transformation will also require working with partners that have complementary skills, for example on political economy.

03 Maintaining multi-functional landscapes in a climate crisis

CGIAR will advance research on maintaining sustainable landscapes – terrestrial, freshwater and marine ecosystems – recognizing a whole landscape approach needed for transformation of food systems. Multidisciplinary research will integrate biophysical, social and institutional innovations to enable scalable solutions, including action research on governance and management of land and water systems and co-design with local communities, with attention to concerns around social equity. Using advances in remote sensing and big data, CGIAR will increase quality and use of data to assess landscape trajectories, identify trends and analyse trade-offs and synergies between land uses and users for equitable solutions. Water management research will advance multi-purpose planning with adaptive institutional mechanisms to enable and deliver technical and policy solutions. Circular water systems that recover and reuse resources will incorporate nature-based water solutions, adapted to the scale and capacity of user communities.

New research will address knowledge gaps and incentive mechanisms on restoration of degraded ecosystems that are essential for adaptation and mitigation to climate change and biodiversity conservation.

04 Improving nutrition and One health

At the interface of diets, environment, climate change, gender and equity, CGIAR will do more research on incentives, regulation, food environments and appropriate responses to supply and demand needs. Research will focus on affordable, sufficient and healthy diets that fit local consumer preferences including new crops, biofortification, cellular agriculture and novel protein sources to combat malnutrition, improved understanding of food preferences, food processing and other nutrition-sensitive actions for under- and over-nutrition. CGIAR will strengthen research on gender empowerment, social inclusion programs and policy support that are critical for improving household nutrition and health. The Covid19 pandemic has brought into sharp focus the interconnections among human, animal and environmental health. Through an integrated One Health approach, CGIAR will enable partners to achieve outcomes of better food safety, environmental health and disease control (plants and animals) with direct benefits to public health. Research on food safety and anti-microbial resistance will be deployed to address foodborne illnesses, and to improve the quality and nutritional value of food.

05 Strengthening policies, markets and services for food systems transformation

CGIAR will provide the evidence base to national and regional bodies to enable the development of policy options for food system transformation. More specifically, research into strengthening public policy and governance (water, nutrition, and environment), and on financial and advisory services, will help to build value chains critical for lifting small-scale farmers and food system workers out of poverty, and to provide equal opportunities for women and for youth. Taking advantage of the digital and big data revolutions, research will enable markets and public sector actions to incentivize climate-resilient and low emission practices. Foresight and trade-off analysis among technologies or innovations will inform the policy and institutional responses. Market and consumer trend analysis will feed back into the development of technological options, innovations in services to food system actors (e.g. financial, market intelligence, agro-advisory, pests and diseases surveillance and institutional options). New

research on innovative approaches focusing producer-market- consumer linkages will aim at strengthening business relationships based on sustainability, inclusion and competitiveness.

Some cross-cutting areas are relevant to all of the above:

06 Reducing inequalities and vulnerability for women and youth

CGIAR will deliver new evidence, close data gaps and identify integrated solutions to reduce social inequalities within changing food, land and water systems – addressing gender and youth particularly, as well as other forms of discrimination. Research will advance methods for understanding and overcoming the root causes of gender inequality, and foster critical thinking and cultural change on gender in agricultural research for development by identifying concrete solutions at technological, organizational, and institutional and policy levels. Work will be facilitated through strong integration and progress in socioeconomic and behavioural sciences, including modelling using big data. Special emphasis to demonstrate that working in agriculture and food is exciting for young people because of the new tools (digital, mechanization, small businesses along the value chain, and services), will also be an area of focus.

07 Leveraging national and global responses to the climate crisis

CGIAR will integrate climate action across the portfolio to address adaptation and mitigation challenges and support governments and partners to deliver commitments under the Paris Agreement while providing improved food and nutrition security. Through global policy engagements, CGIAR will provide thought leadership in advancing climate science and policy processes in agriculture and food security. Novel approaches will apply a climate-risk lens and, through innovative partnerships with the finance and agribusiness sectors, facilitate greater and better investments in agriculture to address the climate crisis. Integrated foresight and modelling, use of big data, algorithms and artificial intelligence, agroecology and social sciences will inform better decision-support tools to assess and manage risks. Climate-smart technologies and practices will build on local knowledge that includes diversified portfolios of crop varieties and animals to balance risks and increase nutrition. CGIAR research will leverage sustainable finance to develop new instruments to incentivize and support adaptation and mitigation efforts.



All pictures are just placeholders





PART 2

Research for development objectives to 2030

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Some challenges are best addressed at the global level instead of, or in addition to, the regional level. Therefore, the CGIAR portfolio will include both regionally and globally focused projects.

Challenges to meet at the global level

Three important criteria for preferring a global over a regional approach are: (i) existence of a critical global entry point for research to contribute to transformation, for example a strong global policy process, (ii) the benefits of common tools, approaches and standards outweighing the benefits of regional demand-led specificity, and (iii) major opportunities for connectivity among regions, for example for genetic materials. These will be further articulated in the CGIAR Investment Plans, but possible examples include:



EX-SITU CONSERVATION VIA GENE BANKS – CGIAR genebanks have the obligation to conserve and make available accessions of crops, trees and forages on behalf of the global community under the International Treaty on Plant Genetic Resources for Food and Agriculture.



GLOBAL CROP IMPROVEMENT STRATEGIES – Strategies for accelerating genetic gain and breeding management systems are best deployed globally in terms of scope, scale and cost. Economies of scale and scope can enhance and integrate prioritized crop x sub-region targeted breeding efforts.



CLIMATE CHANGE GLOBAL POLICY AND TOOLS FOR FOOD, LAND AND WATER SYSTEMS – The very nature of the climate change problem is global, and key partnerships in science (IPCC) and policy (UNFCCC) operate at the global level. While the implementation might be national or regional, many policy processes are defined internationally.



GENDER EQUALITY – global capacity is underdeveloped – and needs to be built urgently – to expedite system transformations by creating greater gender equality. Women's empowerment is essential to harness the full potential of the beneficiary communities in service of achieving the other four impact areas. CGIAR is uniquely positioned to work with global alliances to provide high-quality evidence on what works for women's empowerment in agriculture.

Global work will always endeavor to lead to regional and local outcomes and impacts, often by working with and through regional projects and through interface with development partners that are operating at all levels from global to national.

Prioritized challenges and research for development opportunities by region

Most research and innovation will be realized at the **regional level** with local stakeholders. CGIAR will leverage its multi-disciplinary research and multi-layered presence in integrated projects across six major regions. Where relevant, regional projects will be supported by global research platforms and communities of practice to accelerate progress and impacts.

Regional opportunities have been identified through triangulation of three types of evidence: **global**

significance (scientific evidence on how and where to maximize impact on SDGs); **regional relevance** (expressed stakeholder demand, from regional strategy documents and stakeholder survey); and **investor preference** (individual investor priorities), as shown in Figure 3.

Detailed priority-setting is expected at the level of CGIAR 3-year investment plans and CGIAR Projects, based on more detailed co-analysis and co-design together with partners and investors – as outlined in Part 3 on how CGIAR will manage research for impact. Responsiveness to local stakeholders' needs and investors' priorities will be a central feature of all CGIAR work, and will determine the focus of CGIAR Projects.

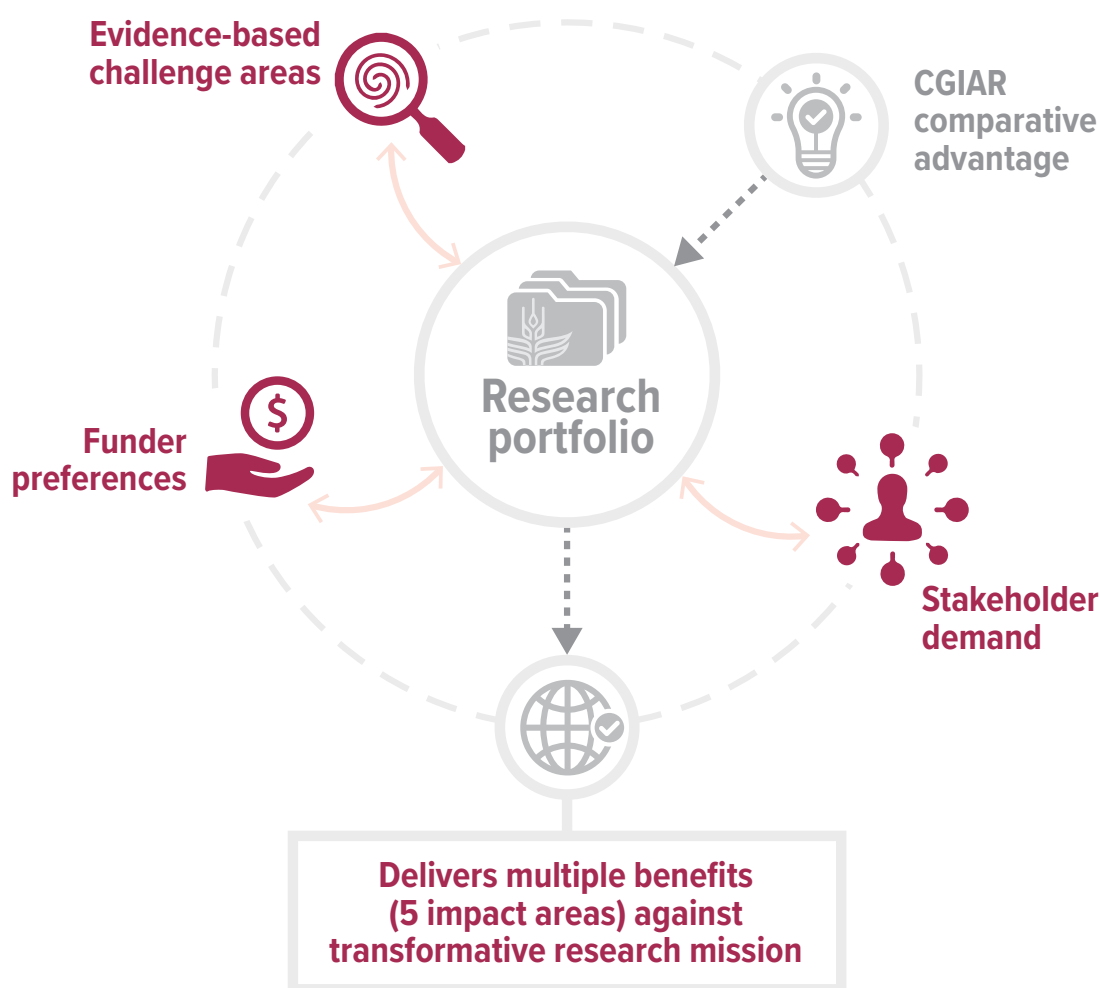


Figure 3. Triangulation principle and elements for priority setting.

West & Central Africa (WCA)

- ✓ With a growing young population, access to economic opportunities, equal access for young women and men are key to food system transformation in rural and urban areas. As agricultural markets grow, so too should opportunities for employment in value chains and secondary industries associated with agriculture and food.
- ✓ There is an urgent need to reduce agricultural productivity gaps (crop, livestock and aquaculture) with yield gaps range from 50% to 90% for major staple crops.
- ✓ Increasingly erratic rainfall, particularly across the Sahel, including deadly dry spells within growing seasons, are driving changes in livelihoods, for example from cropping into livestock or out-migration to urban areas.
- ✓ The region shoulders the world's highest per capita incidence aflatoxin and other foodborne diseases requiring One Health approach for food and nutrition security.
- ✓ Low nutritional status, particularly among children, underlines the need for greater diversity of food production and access, including vegetable farming, agroforestry products, biofortified staples and animal-source foods.

East & Southern Africa (ESA)

- ✓ Rapid economic growth with a buoyant private sector and urban middle class, yet home to alarming levels of hunger, poverty and child stunting.
- ✓ Lags in agricultural productivity, with high yield gaps and low labor productivity and is highly vulnerable to climate change and other shocks and stresses.
- ✓ The service sector's digital revolution has had flagship successes in this region, such as MPESA, and can be harnessed to provide products and services that support risk management in food and farming systems.
- ✓ Large-scale land degradation, but also large-scale successes in restoration and multi-purpose land management, often involving community-based approaches.
- ✓ The growing urban middle class rely heavily on purchased food and supporting markets for more diverse foods (e.g. vegetables).
- ✓ High incidence aflatoxin in food and other foodborne diseases.

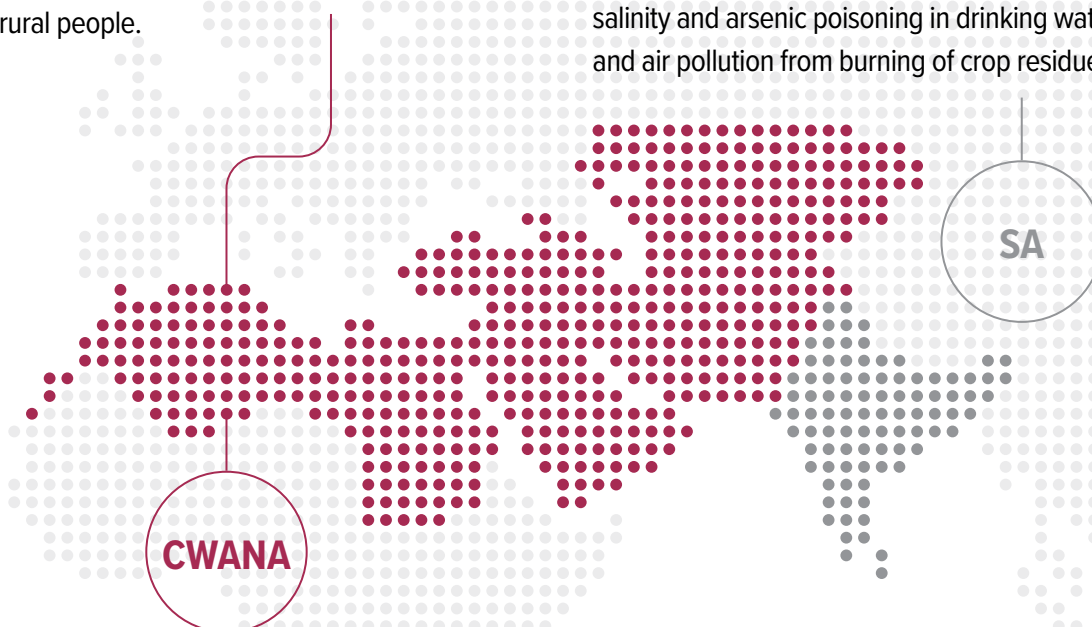


Central & West Asia & North Africa (CWANA)

- ✓ Offers globally valuable lessons to the world's current and future drylands under climate change.
- ✓ High levels of conflict and migration, gender disparities and youth unemployment.
- ✓ World's most water-stressed region and major risks to agricultural livelihoods are erratic rainfall, declining water availability and displacement due to conflict (some due to environmental factors).
- ✓ Pathways out of agriculture will also be key to economic development under increasing climatic stress. Countries are net importers of cereals to meet growing demand; cereal production systems have high yield gaps and low water use and input use efficiency.
- ✓ Economic opportunities for women and youth in agriculture and food are challenged by limited arable land and water for commercial agriculture, lack of credit, gender disparities and weak institutions.
- ✓ Strengthening livelihoods in food systems needs considerable investment and enabling policies along with agro-ecological and other sustainable technologies, water governance, and innovative climate risk management approaches in both farming systems and in food supply to both urban and rural people.

South Asia (SA)

- ✓ Home to a third of the world's stunted children under five years. Poor nutritional outcomes are due to unsafe water, poor sanitation (causing diarrhea and anemia), poverty, a diet high in energy relative to fats, proteins and micronutrients, and the low status of woman in society.
- ✓ Productivity and long-term sustainability of crop, livestock and fisheries systems are strained by population density, resource scarcity (water and land – both in quantity and quality), and rising costs (labor, energy, fertilizer).
- ✓ Key climate risks in the region are rising temperatures, desertification, erratic monsoon, flooding and sea-level rise.
- ✓ Inefficient use of inputs including fertilizer and water (above and below ground) and declining water quality are widespread in the Indo-Gangetic Plains (northern and eastern India, the eastern parts of Pakistan, and Bangladesh).
- ✓ The region offers an important opportunity to reshape major cereal production systems so that food security of a growing population can continue to be met, at the same time adapted to offer food that is more diverse and nutritious.
- ✓ A major public health crisis is unfolding from salinity and arsenic poisoning in drinking water and air pollution from burning of crop residues.



Southeast Asia & the Pacific (SEA)

- ✓ Diets in the region show wider variance from national dietary guidelines than is true for other world regions; micronutrient deficiencies are endemic in poorer populations and common even among urban middle-classes.
- ✓ A quarter of the estimated 600 million people suffering from foodborne diseases each year are in Southeast Asia, with key consumer risks in dairy, poultry and seafood contamination, as well as pesticide and antimicrobial residues on crops.
- ✓ Key climate risks in Southeast Asia are flooding, sea level rise and salinization. Coastal areas and major deltas – such as the Mekong and the Irrawaddy – are particularly at risk, as they are home to dense populations of people alongside vast areas of rich floodplain crop production, plus the mangroves that protect coastlines and provide breeding grounds for fisheries.
- ✓ Home to 15% of the world's biodiverse and high-carbon tropical landscapes but has lost vast areas of lowland and highland forests in recent decades from deforestation.
- ✓ Global leader in appropriate technologies and policies to reduce methane emissions from rice farming, and has world-leading examples of mixed land management using agroforestry and perennials, offering multiple benefits to farm productivity and resilience while addressing societal threats like landslides.
- ✓ There is a great potential for sustainable intensification of cereal based systems and diversification to support food security, nutrition needs and livelihoods.



Latin America & the Caribbean (LAC)

- ✓ Profound socio-economic disparities and a triple burden of malnutrition. Countries in the region report the world's highest rates of obesity, side by side with both macro-and micro-undernourishment, particularly in Central America and the Caribbean and the Andean region.
- ✓ Climate variability, experienced now through long dry spells and effects such as increasing plant diseases, are shifting large areas out of production of key crops, including major export crops, with critical economic impacts in a region that is a net exporter of agricultural and food products globally.
- ✓ Diversification in both agriculture and value chains can catalyze better nutritional outcomes, socioeconomic inclusion, and income generation for producers and consumers.
- ✓ Degraded lands now account for over 20% of forest and agricultural lands in the region, with negative effects on water-holding capacity, productivity and biodiversity.
- ✓ Preventing deforestation and expansion of the crop and livestock frontiers into the globally significant Amazon ecosystems is critical to global achievement of the Paris Agreement.
- ✓ The region also hosts the greatest genetic resources base for crops and foods grown and consumed worldwide, which is under decline due to agricultural expansion, intensification and urbanization.



Table 2. Prioritized regional research for development opportunities of global significance. .

West & Central Africa (WCA) Strategic regional opportunities					
<p>Closing of yield gaps and increased land, labor productivity and input use efficiency and in farming systems, through multiple interventions across agronomy, husbandry, breeding, plant and animal health, and gender research</p>	<p>Diversification in cropping, livestock and fisheries systems and their landscapes, to meet increasing frequency and severity of climatic shocks, and to supply more diverse and nutritious food in response to urban and rural demand</p>	<p>Building risk-management and resilience at multiple levels, including products and services to food system actors, using digital tools and communications, including finance, advisories, early warning systems or insurance schemes.</p>	<p>Enhanced food safety, taking a One Health approach, embedding into nutrition, and linking on-farm with post-farmgate interventions</p>	<p>Development of agricultural markets and secondary industries, with a focus on economic opportunities for women and youth, supporting alternative income opportunities beyond agriculture</p>	<p>Equality of access and opportunity for women, including from the perspectives of household health, nutrition and early childcare</p>
East & Southern Africa (ESA) Strategic regional opportunities					
<p>Increased land, labor and input productivity and closing of yield gaps in farming systems, through multiple interventions across agronomy, husbandry, breeding, plant and animal health, social sciences and gender research</p>	<p>Diversification in cropping, livestock and fisheries systems and their landscapes, to meet increasing frequency and severity of climatic shocks, and supply more diverse and nutritious food in response to urban and rural demand</p>	<p>Building risk-management through market opportunities, including services to food systems actors, using digital tools and communications, such as finance, information and advisories</p>	<p>Enhanced food safety, taking a One Health approach, embedding into nutrition, and linking on-farm with post-farmgate interventions</p>	<p>Soil management and land restoration to rehabilitate degraded lands into productive, multi-purpose landscapes</p>	
Central & West Asia & North Africa (CWANA) Strategic regional opportunities					
<p>Above- and below-ground water management at both farm and watershed levels to maximize efficiency, equitable distribution and resilience</p>	<p>Large-scale shifts and diversification in agricultural development pathways due to climatic risks and changing markets</p>	<p>Strong focus on risk management in agri-food systems, bringing into play a variety of tools and services, many digital-based, to secure food supplies and livelihoods</p>	<p>Increasing opportunities – and equality of access to resources and decision-making – for both women and youth</p>		

South Asia (SA) | Strategic regional opportunities

Improving **input and resource use efficiency** in cropping, livestock and fisheries systems, while **closing yield gaps** linked to more sustainable landscape & forest management

Diversification in food supply to improve nutrition, coupled with enhanced food safety, linking with environmental health and with demand and drivers from the food system

Risk management using resilient breeds, digital tools and services, including finance, information and advisories – where possible linked to enhanced livelihood opportunities for youth and women

Above- and below-ground **water management** at both farm, watershed and basin levels to maximize efficiency, equitable distribution and resilience

Management of **healthy soils**, including restoration of degraded land and landscapes

Southeast Asia & the Pacific (SEA) | Strategic regional opportunities

Enhanced food safety, taking a **One Health approach**, embedding into nutrition, and linking on-farm with post-farmgate interventions and consumer needs

Diversification of production systems to provide a more nutritious food supply including livestock, fisheries, legumes and fresh vegetables

De-risking farming and food systems through resilient breeds, early warning systems, food trade, digital technologies and on-farm land-use change

Enhance environmental health **through forestry and its boundaries with agriculture**, and wider attention to wetland and peatland landscapes

Optimize cropping systems to **reduce greenhouse gas emissions**, coupled with wider efforts, including agroforestry & agropastoral options

Latin America & the Caribbean (LAC) | Strategic regional opportunities

Sustainable intensification of agricultural, pastoral, agropastoral and agroforestry systems while closing yield gaps, coupled with zero deforestation and non-conversion of wetlands and grasslands

Large-scale shifts and **diversification** in agricultural development pathways due to climatic risks and changing markets, including demand for micronutrient rich crops for health

Risk management using resilient breeds, digital and other social innovations in farming and food systems.

Management of healthy soil, including **restoration of degraded land and landscapes**.



All pictures are just
placeholders





PART 3

Managing research for impact

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This section outlines the plans and modalities for implementing the research strategy.

Implementing the 10 strategic directions



Embrace a **systems-transformation approach** for food, land and water systems

KEY IMPLEMENTATION ELEMENTS

- ✓ Evidence-based approach based on system analysis, focus on priority entry points for system change and course corrections based on M&E and learning
- ✓ Use of foresight and trade-off assessment during project development and implementation



Embed demand-responsive research within ambitious **partnerships for change**

KEY IMPLEMENTATION ELEMENTS

- ✓ Inclusion of systems-based, partnership-based theory of change in all CGIAR Project designs
- ✓ Linking with global advanced institutions and regional NARS, NGOs, GOs and the private sector
- ✓ Adoption at Project level of targets and metrics developed, used and measured by partners
- ✓ Greater investment in processes and products to improve responsiveness and uptake of research
- ✓ Commissioned evaluations to capture partners' assessments of CGIAR contributions to partners' agendas for transformation



Target **risk-management and resilience** in the face of the climate crisis and other shocks

KEY IMPLEMENTATION ELEMENTS

- ✓ All CGIAR Project designs will address solutions that are robust across multiple scenarios and contexts, linked to multiple benefits and theories of change
- ✓ Greater collaboration with service-oriented partners, including lending and insurance sectors, on specific risk management tools



Pursue **multiple benefits** across five SDG-focused global challenges and impact areas

KEY IMPLEMENTATION ELEMENTS

- ✓ Inclusion in assessment criteria for all CGIAR Project designs
- ✓ Use of foresight and trade-off assessment during project development and implementation
- ✓ Multi-disciplinary approach to project development and implementation
- ✓ Multiple benefit reporting requirement for all CGIAR projects (including bilateral) in the Performance & Results Management System



Position **regions, countries and landscapes** as key dimensions of delivery

KEY IMPLEMENTATION ELEMENTS

- ✓ Active ongoing engagement with stakeholders on identifying shared priorities, co-designing activities and cultivating critical research and development partnerships
- ✓ Project-level objectives align with national and regional targets and plans
- ✓ Commissioned evaluations to capture stakeholder assessments of CGIAR success in meeting demand



Deepen our engagement with the **private sector**

KEY IMPLEMENTATION ELEMENTS

- ✓ Engaging with private sector actors in CGIAR project formulation and implementation to bridge the gap between innovation and uptake
- ✓ Monitoring innovations in the private sector to promote cross-fertilization of ideas
- ✓ Engaging in scientific and policy dialogue encompassing a wide array of stakeholders (including farmers, SMEs, major companies)
- ✓ Systematic use of tools such as market research, product profiles and stage-gated research management with clear milestones



Generate evidence on **multiple transformation pathways**

KEY IMPLEMENTATION ELEMENTS

- ✓ Providing knowledge on different pathways or a mix of pathways and evidence for the optimization of choices
- ✓ CGIAR Projects will include options for transformation pathways to help stakeholders make decisions and select trade-offs best adapted to their situation, for greater uptake and sustainability of research outputs



Make the **digitization transformation** central to our business model

KEY IMPLEMENTATION ELEMENTS

- ✓ A new digital strategy for CGIAR to be launched in Q2 2021
- ✓ Engaging with private sector stakeholders and development partners on developing cutting-edge digital solutions and improving access to and use of digital innovations by partners, with focus on small-scale farmers
- ✓ CGIAR Projects will incorporate digital tools and approaches as appropriate to their context, including artificial intelligence, machine learning and big data



Create delivery mechanisms for research that guarantee **greater focus**

KEY IMPLEMENTATION ELEMENTS

- ✓ Implementing a new operational system for proposing and carrying out research with impacts at both regional and global level, with robust prioritization of CGIAR projects and a mix of high-risk and low-risk innovation across the portfolio
- ✓ Designing and implementing a comprehensive Performance & Results Management System for managing research that encompasses transparent planning, resource allocation and reporting and includes stage-gates
- ✓ Actively attracting and developing scientific expertise that couples specialist and generalist aptitudes (T-shaped skills) through appropriate recruitment, staff development, academic exchanges and partnerships



Build a shared portfolio of research based on **pooled funding**

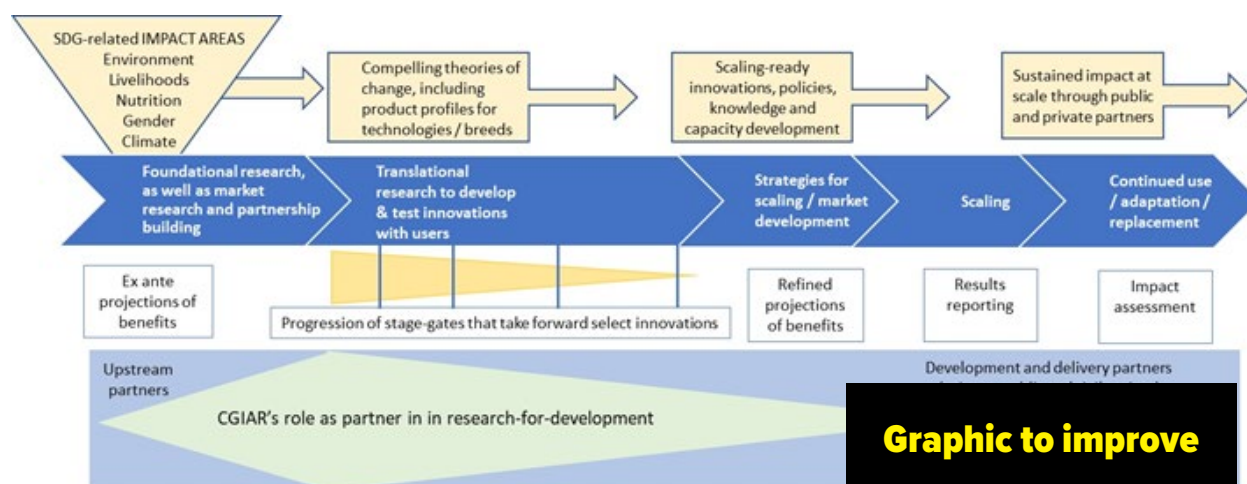
KEY IMPLEMENTATION ELEMENTS

- ✓ A new pooled fundraising strategy to be launched in Q1 2021
- ✓ Targets for both overall budget levels and proportion pooled funding
- ✓ Three levels of prioritization in the research portfolio to maximize strategic use of pooled funds
- ✓ Sufficient funding entry points to maximize investor engagement in shared agendas

Partnerships and CGIAR's strategic role in development

- To work towards systems transformation while playing a bounded and appropriate role, CGIAR will embed its work in **strategic partnerships** at both CGIAR Project and institutional levels. Strategic partnerships are defined as collectively having ambitious goals, strategies and tactics for transformation of food, land and water systems.
- Choice of partnerships will be based on theories of change at sub-national, national, regional and global levels, depending on the **context-specific transformation pathway**. These pathways and partnerships may involve different routes to impact: via technical and institutional innovations, policy change, or capacity development, for example.
- Following the categories established in the independent review of CGIAR partnerships in 2017, CGIAR will develop **bilateral and multilateral partnerships** of the following three critical types
 - ✓ **Partnerships along the impact pathway** (for upstream research, and for applied research and scaling) – key partners to co-deliver on innovations in technology, institutions and policy include advanced research institutes, NARES, national governmental agencies, regional bodies, and scaling partners in the public and private sectors, often assisted by civil society partners, farmers, and consumers.
 - ✓ **Partnerships with the private sector** – building interdependent relationships with small, medium and large enterprises to deliver outcomes from research along specific impact pathways, as well as with private sector coalitions such as industry bodies to accelerate sector-wide progress
 - ✓ **Multi-stakeholder platforms** – structured alliances of stakeholders from public, private and civil society convened in the international development community to address complex global problems enshrined in the SDGs, with CGIAR participating in those whose architecture and activities are best designed to link global policy and local action, and whose actions are informed by research.
- A common type of partnership along the impact pathway for CGIAR is within **innovation systems** for development and uptake of technologies, breeds or practices. The concept of an innovation system stresses that the exchange of technology, information and other inputs among people, enterprises, and institutions is key to an innovative process.
- Within innovation systems, there are no hard boundaries where CGIAR stops and starts (Figure 4). CGIAR works on both (i) **foundational** research, the more upstream research conducted with advanced research institutes, and (ii) **translational** research, which uses knowledge and discoveries from foundational research to achieve on-the-ground impacts and benefits to society (SDGs).

Figure 4. CGIAR role as a strategic partner in innovation systems (maximizing learning and strategic adjustments via a performance and results management system)



Modalities for delivery

Plans to manage the modalities of research were agreed by the CGIAR System Council in November 2019.

CGIAR Projects

These will be the principal instrument to deliver on the global and regional challenges set out above. Key features and design principles of these CGIAR Projects are:

All CGIAR Projects will share the following 10 features:

- Modelled on the **best examples** of successful large projects and interventions under Window 3, bilateral, CRPs and Platforms
- Approved **sequentially** over the business plan period rather than all at once
- Fully funded by Windows 1 and 2 **pooled funding** and not including Window 3 and bilateral funding within project scope
- Based on a compelling **theory of change** – an end-to-end design for delivery from research to impact-at-scale by working in partnership
- A clear problem statement, rigorous priority-setting, purpose-driven solutions and a focused set of **metrics for success** in the form of 3-year measurable objectives (outputs and outcomes) that map to the global and regional challenges set out above – using appropriate and innovative metrics of success, considering time lags from research to large-scale impacts, and making the most of modern tools such as genetic markers
- Realistic and transparent **costing** explicitly linked to expected results
- Apply operational and geographic **focus**, based on priorities identified through scientific evidence, stakeholder demand and investor preferences
- Manage the research-to-development process via a sequence of **stage-gated decision points**, using a universal Performance & Results Management System that encompasses planning, monitoring, stage-gate decision points and reporting on impacts
- Identify ex ante **multiple-benefits** and trade-offs across the SDGs (as framed by CGIAR's 5 Global Challenges)
- Combine disciplines to generate **solutions that address the stated problem** as effectively as possible, from a systems perspective, rather than relying on supply-driven solutions

Some priorities are best addressed at the global level, instead of, or in addition to, the regional level. Therefore, the CGIAR portfolio will include both regionally and globally focused CGIAR Projects.

CGIAR 3-Year Investment Plans

This plan will be prepared every 3 years in line with CGIAR's business planning cycle. It will present a prioritized pipeline of (3-year) CGIAR Project concept notes. Key features of the Investment Plan will include:

- A prioritized series of CGIAR Project concepts sharing established **design principles**
- Focus on use of **pooled funding**, with CGIAR Projects funded only by pooled
- Prospective **bilateral grants** can be included as contributing to prospective investment plan results, but not as CGIAR Projects
- Concepts developed according to **overall funding target** for the business cycle (2022-2024, 2025-2027, 2028-2030), expressed as a range. Concepts will be presented as prioritized list per area depending on extent of funding/range



All pictures are just placeholders

Performance and results management, with stage-gate decision points

Building on investments made in the current phase of CGIAR research programming, a comprehensive Performance & Results Management System that encompasses planning, monitoring, and reporting will provide robust information upon which to take informed decisions. It will be designed to provide:

- ✓ Practical services towards learning, accountability and fundraising objectives
- ✓ A clear line of sight from CGIAR Project investments to SDG contributions
- ✓ Systematic and transparent tracking of impact, performance and expenditure
- ✓ Dashboards open to Funders and partners, with access to the full set of underlying quality-checked data
- ✓ Alignment with international standards e.g. IATI (International Aid Transparency Initiative)

Stage-gate decision points will be used to manage CGIAR Project sub-components. To implement this approach universally, CGIAR Projects will be divided into distinct stages, separated by assessment and decision points known as 'gates' as part of a standard project review cycle. The gates will determine resource allocation within Projects to the most promising and impactful components. The stage gates will:

- ✓ Enable transparent, evidence-based allocation of resources
- ✓ Support development and adaptive delivery of Projects along a theory of change
- ✓ Facilitate performance management using specific indicators and metrics
- ✓ Encourage innovation and creativity, through different allocation of funds for early-stage versus late-stage research



Annex 1. Links between CGIAR global challenges, contributions to impact, and the SDGs

NUTRITION & FOOD SECURITY	POVERTY REDUCTION, LIVELIHOODS & JOBS	GENDER EQUALITY, YOUTH & SOCIAL INCLUSION	CLIMATE ADAPTATION & GHG REDUCTION	ENVIRONMENTAL HEALTH & BIODIVERSITY
Deliver affordable healthy diets to XX million people, ending hunger for XX million	Lift XX million people above the US \$1.9 per day poverty line.	XX million women and youth have access to power and productive resources	Reduce greenhouse gas emissions by X% and resilience enhanced for XX million.	Zero deforestation and restore XX million hectares of degraded ecosystems.
SDG2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture				
Target 2.1: End hunger (safe, nutritious and sufficient food) Target 2.2: End all forms of malnutrition Target 2.4: Ensure sustainable food production systems (increase productivity and production)	Target 2.3: Double the agricultural productivity and incomes of small-scale food producers	Target 2.2: End all forms of malnutrition (address nutritional needs of adolescent girls, pregnant and lactating women and older persons) Target 2.3: Double the agricultural productivity and incomes of small-scale food producers (women & indigenous peoples)	Target 2.4: Ensure sustainable food production systems (resilient agricultural practices, strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters)	Target 2.4: Ensure sustainable food production systems (maintain ecosystems, improve land and soil quality) Target 2.5: maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species
Other SDGs: SDG1 End poverty in all its forms everywhere, SDG5 Achieve gender equality and empower all women and girls, SDG6 Ensure availability and sustainable management of water and sanitation for all, SDG13 Take urgent action to combat climate change and its impacts, SDG15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss				
Target 12.3: Halve per capita global food waste (post-harvest losses)	Target 1.1: Eradicate extreme poverty for all people everywhere	Target 1.4: Ensure equal rights to economic resources, ownership and control over land, natural resources, new technology and financial services Target 5.a: Give women equal rights to economic resources, access to ownership and control over land and natural resources Target 5.b: Promote the empowerment of women (use of ICT)	Target 1.5: Build resilience of the poor and vulnerable (reduce exposure & vulnerability to climate-related extreme events) Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards Target 13.2: Integrate climate change measures into national policies, strategies and planning Target 15.2: Promote implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and increase afforestation and reforestation	Target 6.4: Increase water-use efficiency (reduce the number of people suffering from water scarcity) Target 15.1: Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services Target 15.3: Combat desertification, restore degraded land and soil, and strive to achieve a land degradation-neutral world



CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to reducing poverty enhancing food and nutrition security and improving natural resources and ecosystem services. Its research is carried out by 15 CGIAR Centers in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector



CGIAR System Organization

1000 Avenue Agropolis
34394 Montpellier
France

Tel: +33 4 67 04 7575
Fax: +33 4 67 04 7583
Email: contact@cgiar.org

www.cgiar.org