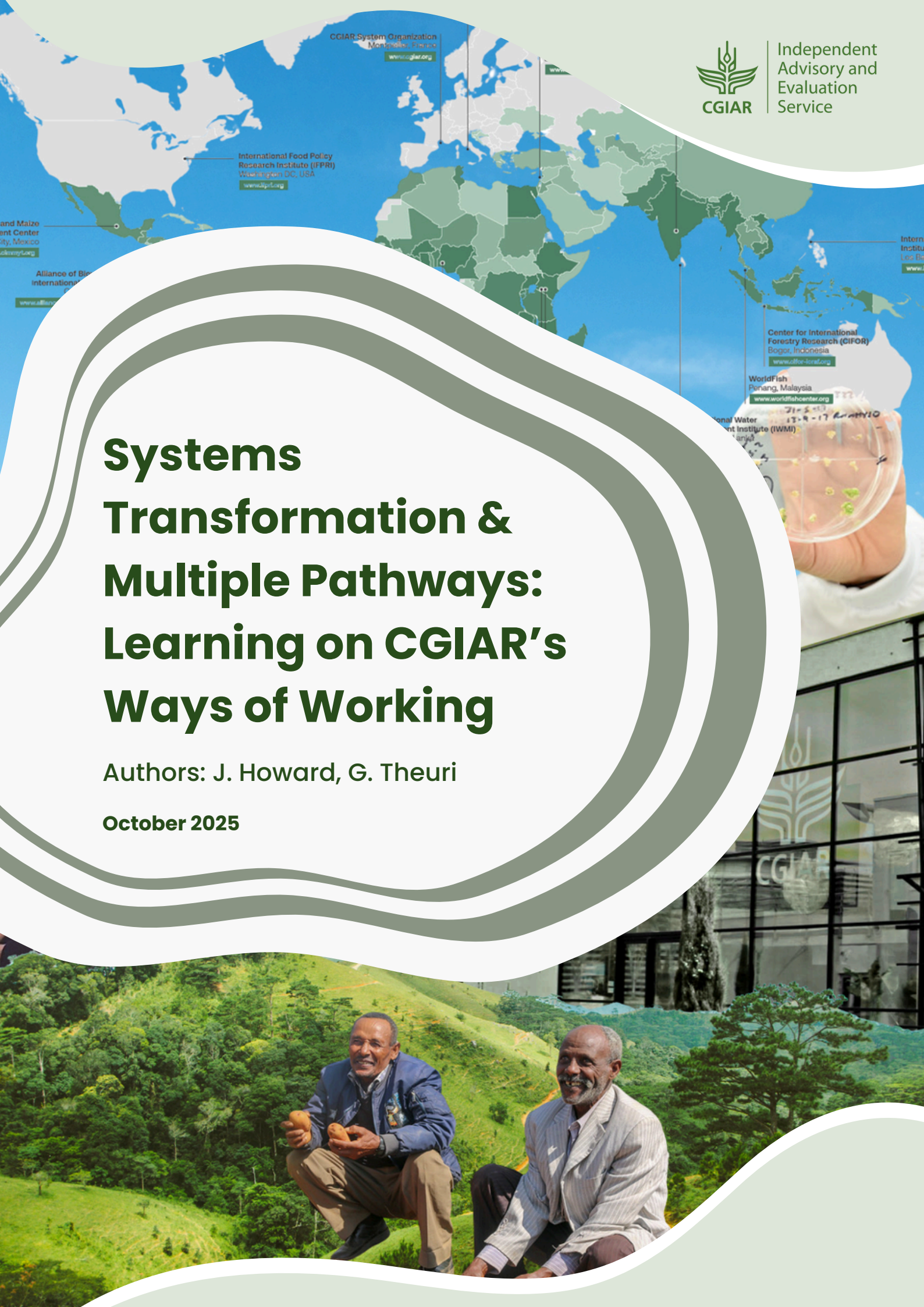

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Systems Transformation & Multiple Pathways: Learning on CGIAR's Ways of Working

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List of Acronyms

AfDB	African Development Bank
B4T	Breeding for Tomorrow
BDN	Better Diets and Nutrition
CCAFS	Climate Change, Agriculture and Food Security
CGIAR	Consultative Group for International Agricultural Research
CIAT	International Center for Tropical Agriculture
CRP	CGIAR Research Program
CSA	Climate Smart Agriculture
FLW	Food, Land and Water
FRESH	CGIAR Initiative on Fruit and Vegetables for Sustainable Healthy Diets
FTA	Forests, Trees, and Agroforestry
GI	Genetic Innovation
IAES	CGIAR Independent Advisory and Evaluation Service
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
IRRI	International Rice Research Institute
ISDC	Independent Science for Development Council
NARO	National Agricultural Research Organization
NPS	CGIAR Initiative on National Policies and Strategies
RAFS	Resilient Agrifood Systems
S4I	Scaling for Impact
SAAF	Sustainable Animal and Aquatic Foods
SF	Sustainable Farming
SG	Science Group
SI	Sustainable Intensification
SPIA	Standing Panel on Impact Assessment
ST	Systems Transformation
WEFE	Water-Energy-Food-Ecosystem
WoW	Way of Working

Overview

This summary, developed under the System Council–endorsed Multi-Year Evaluation Plan (MYEP), reviews two of CGIAR's Ways of Working (WoWs) in the 2030 Research and Innovation Strategy: (1) Systems Transformation-advancing integrated research that addresses interconnected goals across climate, nutrition, equity, livelihoods, and environment; and (2) Multiple Transformation Pathways- providing evidence on diverse, context-specific approaches such as sustainable intensification (SI) and agroecology.

Drawing on IAES Evaluation Function evaluations, Independent Science for Development Council (ISDC) and CGIAR Standing Panel on Impact Assessment (SPIA) reviews, 2025–30 Portfolio inception reports, external literature, and field evidence from Uganda, the report synthesizes progress, challenges, and opportunities in implementing the 2030 Strategy.

CGIAR has advanced systems-oriented research, but conceptual clarity, consistent operationalization, and sustained funding remain limited. Promising interdisciplinary Initiatives combined biophysical, social, and policy dimensions, yet transdisciplinary capacity–particularly in social sciences and stakeholder engagement-remains weak. Integration of climate and nutrition improved, while equity, biodiversity, water, and livelihoods are inconsistently addressed.

Country and regional engagement is essential but uneven. Convenors and Regional Integrated Initiatives (RIIs) effectively bridged some partnerships, though limited mandates and resources constrained broader impact. Foresight and trade-off tools are increasingly used to guide strategy but require wider integration and accessibility. Scaling efforts help spread innovations but often fall short of addressing structural systems change, while institutional and funding pressures risk deprioritizing long-term transformation in favor of short-term outputs.

The 2025–30 Portfolio reflects a stronger shift toward integrated, context-specific approaches. Achieving CGIAR's Systems Transformation vision will require the following: a clearly defined and operationalized framework for Systems Transformation; strengthened transdisciplinary and social science capacity; deeper coordination with national and regional partners; stable, long-term investment and incentives for systems research; improved use of theories of change (ToC) and Monitoring, Evaluation, Learning, Impact Assessment (MELIA) to track systems outcomes.

Overall, CGIAR is moving toward a more integrated and locally grounded model of food Systems Transformation. Lasting progress will depend on institutional alignment, sustained funding, and empowered partnerships that bridge scaling and systems change.

1 Background and Introduction

This report is one of a series of summaries of learning about CGIAR's Ways of Working (WoWs). The Terms of Reference (ToR) present the approach to compiling evaluative evidence and learning related to five of CGIAR's seven Ways of Working (WoW) (2030 Research and Innovation Strategy). WoWs summaries respond to the System Council-endorsed Multi-Year Evaluation Plan (MYEP) in the consolidated 2025-27 Workplan for CGIAR's Independent Advisory and Evaluation Service (IAES) (SC/M21/DP5).

This report focuses on two WoWs:

- **Systems Transformation (WoW 1): embracing a systems transformation (ST) approach, seeking multiple benefits across five Sustainable Development Goal (SDG)-linked Impact Areas.** Today's interconnected global challenges-climate change, environmental degradation, poor nutrition, inequality, and conflict—are deeply tied to how food systems are managed. Food systems are both a cause and a potential solution to these crises. With its leadership in agricultural science, CGIAR is uniquely positioned to drive a realignment of food systems that can deliver not only better nutrition and environmental health, but also inclusive economic and social outcomes. The 2030 Strategy calls for CGIAR to match its past success in crop and livestock science with integrated systems research that addresses interconnected goals across health, equity, livelihoods, and the environment (CGIAR System Organization, 2021).
- **Multiple Transformation Pathways (WoW 2): generating scientific evidence on multiple transformation pathways that are appropriate to different contexts.** The 2030 Strategy calls for CGIAR to produce scientific evidence on diverse transformation pathways tailored to varying contexts. Approaches such as sustainable intensification (SI) and agroecology will inform options suited to the wide diversity of agricultural, land, water, and food systems. Since no single solution fits all, the key challenge is to support stakeholders in making informed decisions and navigating trade-offs. CGIAR will contribute to ongoing and future debates with rigorous, balanced research—serving as a trusted source of evidence to guide the optimization of choices in Food, Land, and Water (FLW) systems (CGIAR System Organization, 2021).

2 Objectives and Key Questions

The WoWs summaries synthesize evaluative and assurance evidence to improve the implementation of CGIAR's 2030 Research and Innovation through the lens of the WoWs. Summaries aim to establish a baseline understanding of the current WoWs status and inform pathways for improvements.

Aligned with the CGIAR-wide Evaluation Framework and Policy, summaries provide evidence-based guidance to support strategic decision-making by the System Council, it's Strategic Impact, Monitoring and Evaluation Committee (SIMEC), CGIAR leadership, and boards. Accompanied by knowledge-sharing activities (such as briefs, webinars, and dissemination efforts), they will also foster broader discussions on WoWs in today's context.

2.1 Systems Transformation

The Systems Transformation (ST) section of this summary report will address the following questions:[1]

- How is CGIAR designing and implementing interdisciplinary research that integrates social, economic, environmental, and health considerations?
- How are foresight studies and trade-off analyses used in CGIAR projects (both at development and implementation phases) to support ST?
- To what extent are Impact Areas (environment, livelihoods, equality, nutrition, and climate) embedded into CGIAR program design, assessment, and reporting? What challenges or good practices were observed?
- What gaps in systems research has CGIAR identified and addressed, especially beyond technological solutions? How are environmental and institutional dimensions included?
- What progress has been made in strengthening CGIAR's capacity in systems research?

2.2 Multiple Transformation Pathways

The Multiple Transformation Pathways portion of this summary will explore the following questions:

- What types of transformation pathways and innovations has CGIAR identified and shared across diverse FLW systems?
- How is CGIAR engaging with research users (methods or partnerships) to improve understanding of the benefits, costs, and risks of different options for change? In what ways is CGIAR helping stakeholders navigate and choose between competing transformation options in context-specific ways?
- What evidence was generated through economic and social sciences research on incentives and drivers influencing different transformation pathways?
- How is CGIAR using tactical entry points to support system change through science, rather than trying to address entire systems at once?

3 Approach and Methodology

This summary is based primarily on a structured desk review of internal and external evidence, including IAES-led evaluations and synthesis reports; reviews and assessments from the Independent Science for Development Council (ISDC) and the Standing Panel on Impact Assessment (SPIA); and center-led and Board-commissioned evaluations. It also draws on inception reports from the 2025–30 CGIAR Research and Innovation Portfolio, and relevant external literature. In addition, a field visit to Uganda, together with discussions with researchers and other stakeholders, offered deeper insights into how the WoWs are put into practice through concrete field activities. Using this body of evidence and guided by review questions,

[1] The question [What examples are there where CGIAR's research has contributed to broader societal benefits or been linked to wider impact pathways for transformation?] was excluded from the analysis. There are many reports analyzing CGIAR's achievements and impacts over time, including: CGIAR System Organization, 2025; Fuglie and Echeverria, 2024; and Alston et al., 2022. Given time and resource constraints for this summary, these meta-analyses are not summarized here.

the analysis documents key findings, challenges, and opportunities related to the implementation of WoW 1 and WoW 2 across the CGIAR system and identifies lessons to inform strategic decision-making.

This approach aims to reinforce connections between Monitoring, Evaluation, Learning, Impact Assessment, and Foresight (MELIA-F), in line with CGIAR's broader institutional efforts to improve coordination across centers, programs, and independent data providers. It also facilitates collaboration among CGIAR assurance providers to enhance the effective use of evidence and advice, while streamlining assurance activities to avoid redundancy and reduce the risk of fatigue or frustration among monitored stakeholders.

4 Key Learning: Systems Transformation

Systems research itself is not new to CGIAR. Scientists at CGIAR centers including the International Rice Research Institute (IRRI), International Maize and Wheat Improvement Center (CIMMYT), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Center for Tropical Agriculture (CIAT), and International Institute of Tropical Agriculture (IIITA) were among the pioneers of farming systems research2 beginning in the 1970s (Shaner et al., 1982). Subsequent CGIAR programs developed integrated agricultural systems approaches to advancing productivity, sustainability, nutrition and resilience, including the Challenge Program on Water and Food (2004-13) (Wooley et al 2009), and several CGIAR Research Programs (CRPs), including Humidtropics (2012-16), Dryland Systems (2013-16), Aquatic Agricultural Systems (2011-15) , and long-term, place-based multidisciplinary research such as the Sentinel Research Program of Forest, Trees, and Agroforestry (FTA) (2011-21).

Systems research gained momentum after the 2021 UN Food Systems Summit (UNFSS), which broadened the traditional conceptual lens from farm-level production to the entire food system—spanning production, processing, transport, marketing, and consumption—and recognized its complex links to the environment, health, and livelihoods beyond ending hunger (von Braun et al., 2023; Howard, 2021). Food ST describes the collective efforts needed to change how food systems work, ensuring they deliver better outcomes in the future. Food systems frameworks and pathways attempt to represent these complex dynamics and potential levers for action (Juri et al., 2024, Global Panel on Agriculture and Food Systems for Nutrition, 2023).

CGIAR's first organization-wide attempt at a ST approach began with the design and rollout of the 2022–24 Science Group (SG) Portfolio. This portfolio applied an expansive framework in ST was one of three thematic groups—alongside Resilient Agrifood Systems (RAFS) and Genetic Innovation (GI)—covering 33 research Initiatives. Past CGIAR systems research activities struggled to coordinate and integrate innovations across complex biophysical and socioeconomic contexts and measure its impact over time (Lynam, Byerlee & Moock, 2024; Johnson, 2021). Funding is a continuing issue. Systems research is longer-term in nature and not well aligned with funder expectations for impact in the short run. During the CRP era, for example, most of the flagship systems programs struggled for funding to continue into a second phase (2017-22), although some elements from these programs were incorporated into the second phase of Agrifood Systems CRPs (IAES, 2021).

Evaluating systems research and interventions (including food systems) presents several difficult challenges compared to more traditional program evaluation. These **challenges** include: (1) limited prior

[2] Farming systems research views the farm as an integrated system, focusing on how household-managed components interact with external physical, biological, and socioeconomic factors (Shaner et al., 1982).

evidence to justify approaches; (2) dynamic, multi-faceted nature of interventions that evolve over time; (3) difficulties attributed to observed changes to the intervention, especially at large scales; (4) obstacles in accessing accurate, timely data and aligning collection with long causal timelines and complexities in defining and measuring outcomes amid multiple endpoints; (5) differing stakeholder priorities; and (6) difficult-to-capture environment effects (Neufeld et al., 2024; Boston, 2000; Apgar et al., 2024; Taylor and Donovan 2016; IAES, 2025).

Emerging **recommendations** for improving systems monitoring and evaluation include: (1) developing a strong, collaboratively built theory of change (ToC); (2) assessing a broad range of outcomes to capture impacts, trade-offs, and unintended effects; (3) using mixed methods with triangulation; (4) adopting approaches from other fields, including complexity-aware methods; (5) designing evaluations to be adaptive and flexible while documenting changes transparently; and (6) ensuring full transparency in all aspects of the evaluation process. Future priorities for food systems evaluation include developing better methods to trace food through supply chains, creating metrics for underexplored areas such as sustainability, business resilience, and equity, and harmonizing evaluation frameworks and indicators to strengthen comparability across studies (IAES, 2025; Neufeld et al., 2024; Boston, 2000).

4.1.1 How is CGIAR designing and implementing interdisciplinary research that integrates social, economic, environmental, and health considerations?

Approaches to interdisciplinary research. The 2022–24 Research Portfolio showcased a spectrum of ways to engage multiple fields of expertise (IAES, 2021; IAES, 2024b). Multiple disciplines simply denote the presence of more than one field of study within a program or Initiative. Multidisciplinary approaches bring these fields together to work in parallel on related problems, but with each discipline maintaining its own perspectives and methods (e.g., CGIAR Research Initiatives on Accelerated Breeding, Breeding Resources). Interdisciplinary approaches go a step further by actively integrating concepts, tools, and perspectives from different fields to address shared goals, for example CGIAR Initiatives on Foresight and National Policies and Strategies (NPS). Transdisciplinary approaches extend beyond academia by combining disciplinary and interdisciplinary research with the knowledge and experience of non-academic actors—including policymakers, farmers, and private sector partners—to co-create solutions for complex, real-world challenges, for example CGIAR Research Initiatives on Agroecology, Low- Emission Food Systems (Mitigate+), Nature-Positive Solutions, NEXUS Gains, One Health, Sustainable Healthy Diets through Food Systems Transformation (SHiFT), Fruit and Vegetables for Sustainable Healthy Diets (FRESH).

Ringler et al. (2025) emphasize that future sustainability research should enhance systems thinking both within food systems and across interconnected systems such as diets, health, and energy. They also stress the importance of adopting transdisciplinary research approaches that meaningfully engage resource managers—including farmers—in the co-identification and evaluation of potential interventions. Under the SGs in the 2022-24 Initiatives, in some CRPs and earlier farming systems approaches, transdisciplinary research was carried out through Living Labs and other collaborative, participatory action research methods that integrated biophysical and social sciences. These approaches aimed to support stakeholder groups in developing their own understanding of sustainability and in designing context-specific pathways toward it. Living Labs are place-based, real-world environments where innovation is tested and refined outside of controlled laboratory settings. CGIAR's Living Labs framework is built on core principles such as co-production, gender equality and social inclusion, good governance, and institutional sustainability to drive both existing and innovation processes (Habermann et al., 2023).

CRPs encouraged multiple discipline research through active Communities of Practice, and CRPs featured teams of researchers from different disciplines. The later FRESH initiative (2022–24) developed an 'end-to-end' approach to improve fruit and vegetable systems by integrating interventions across the food system—from consumers to producers. Piloted in Benin, the Philippines, Sri Lanka, and Tanzania, the model combined disciplinary expertise to examine demand generation, food environment improvements, and supply chain strengthening. Early results in Sri Lanka and Tanzania show improved production, higher farmer incomes, and reduced input use and contamination. This co-designed, systems-based approach will continue under the 2025–30 Better Diets and Nutrition (BDN) Program (BDN Science Program, June 2025).

Field discussions in Uganda also highlighted increasing collaboration across multiple disciplines, with CGIAR and Uganda's National Agricultural Research Organization (NARO) teams integrating breeders, social scientists, economists, and gender experts to collaborate on projects with multiple benefits. The International Livestock Research Institute (ILRI) described its shift from siloed work in 2012 to an integrated approach, while the International Food Policy Research Institute (IFPRI) reported shifting beyond policy advice to apply nutrition data in developing mitigation strategies, including biofortified crops—advancing toward broader food ST. However, during field discussions, stakeholders noted that lingering top-down approaches continue to limit CGIAR programs' effective engagement and alignment with national priorities (see Annex 1).

Within the 2025-30 Research Portfolio, Multifunctional Landscapes (MFL), Sustainable Farming (SF), Sustainable Animal and Aquatic Foods (SAAF), and BDN are programs that plan to take a transdisciplinary research approach. In addition, hubs are being set up to connect researchers and stakeholders across disciplines. For example, the Regional Scaling Hub in Kenya, launched in February 2025, aims to foster knowledge-sharing and innovation by linking farmers, cooperatives, government, finance, research, academia, civil society, private sector, and youth influencers. It will provide a shared physical workspace where experts from various disciplines and stakeholders can collaborate on developing strategies to scale agricultural innovations (PAEPARD, 2025).

Continuing challenges in designing and implementing research for ST. During 2022–24, the ST SG sought to fundamentally reshape research across CGIAR to catalyze the transformation of FLW systems toward more sustainable and equitable outcomes. Despite its ambitious framing, several implementation challenges emerged, including the absence of a CGIAR-wide consensus on what ST means and what role CGIAR should play in ST and systems research (IAES, 2024b). The 2024 ST SG Evaluation's first recommendation was to create a cross-CGIAR strategy to define common ST principles, approaches, and processes (IAES, 2024b) emerged. These included the lack of a CGIAR-wide shared understanding of what ST entails or what CGIAR's role in ST and systems research should be (IAES, 2024).

Responding to country and regional priorities. ST is inherently context-specific and unfolds primarily at national and sub-national levels (Breisinger et al., 2023). CGIAR has struggled to shift from its traditional global knowledge role to a locally responsive, flexible partner that supports national and regional priorities (IAES, 2024b). The 2022-24 program evaluations revealed limited co-design and sustained engagement at country level, despite some promising examples of the latter. For example, in Vietnam, at the government's request, SHiFT supported the development and implementation of the National Action Plan for Food System Transformation (NAP-FST) (IAES, 2024b). However, ISDC's review of 2025–30 proposals continued to raise concerns about partner engagement, noting that listening sessions and consultations, while useful, are not substitutes for true co-design, which requires partners to have an active and equal role in shaping priorities, focus, and strategy (ISDC, 2024).

Direct responsiveness to country or regional development priorities and strategies is rare in CGIAR's history, though it has a strong record of aligning with national and regional agricultural research priorities, particularly in breeding (de Janvry & Kassam, 2004; IAES, 2024d). Calls for strengthened coordination with regional and national structures are not new, echoing Recommendation 5 of the 2021 Synthesis of Learning from a Decade of CRPs (IAES, 2021).

Program coordination. Questions remain about internal and external coordination of programs operating in the same country or region–coordination among the programs themselves, of engagement with national and regional stakeholders, and with major programs funded by governments, donors, and multi-lateral banks. While several programs are planning hubs and labs that may provide opportunities for improved collaboration across programs and disciplines, ISDC recommended mapping these entities across all programs to identify and leverage potential synergies (ISDC, 2024). ISDC highlighted a particular need to assess the interdependencies and tradeoffs in mixed farming systems programs (MFL, SAAF, and SF) to better coordinate, define roles, and avoid duplication (ISDC, 2024).

In 2022–24, **country conveners** helped link CGIAR researchers with national stakeholders and coordinate across Initiatives in places with resources (such as Ethiopia, Kenya, Uganda). However, their impact was constrained by the absence of formal mandates and system-wide support. Limited integration of biophysical, social, and economic sciences, along with budget constraints and fragmented internal processes, further reduced effectiveness (IAES, 2024b; Coccia et al., 2025). Reflecting on the Ethiopia country convenor's role in 2022–24, the BDN team voiced concerns that without a defined convenor role in the 2025–30 Portfolio, coordinating cross-CGIAR activities in Ethiopia will be challenging, risking fragmentation, partner fatigue, and higher transaction costs (BDN Science Program, June 2025).

The early inception reports (June 2025) submitted by programs in the 2025–30 Portfolio, signal a potential shift toward more integrated, country-responsive, or place-based, programming. Scaling for Impact (S4I) is envisioned as a system-wide integrator and face for country-level interactions across CGIAR in the countries where it operates, aspiring to embed scaling and partnership principles early in the research process (Coccia et al., 2025). S4I is also building external partnerships to broaden its partner and funding base for scaling CGIAR technology bundles, such as its collaboration with the Technologies for African Agricultural Transformation (TAAT) Clearinghouse, funded by the African Development Bank and other donors. Some 2025-30 Science Program inception reports indicate increasing attention to co-design and capacity sharing with countries. In Malawi, the Policy Innovations (PI) Program is working with the National Planning Commission to support scenario modeling for the Malawi 2063 Accelerator Program and build capacity within Malawi's national institutions to use its modeling and simulation tools. (PI Inception Report, June 2025). There is also greater attention to synergies across some programs—for example, S4I will closely partner with PI, BDN, Breeding for Tomorrow (B4T), and the three transdisciplinary systems programs-SAAF, SF, and MFL (SAAF Science Program, June 2025; SF Science Program, June 2025; MFL Science Program, June 2025).

Linear vs systems-based approaches. Reviews by ISDC and others point to the need for a fundamental cultural shift within CGIAR—from the more traditional linear, technology-centric models to more adaptive, systems-based approaches (ISDC, 2024). Achieving this shift will require incentives that promote greater collaboration across disciplines, responsiveness to local stakeholder input, and adaptive management. This does not mean that every research program should model transdisciplinary research approaches or investigate the entire food system. However, each program must remain attentive to systemic constraints and opportunities shaping its research priorities, innovation pathways, and scaling potential, while collaborating with other programs at country level to align CGIAR's offer with national priorities and ensure ongoing stakeholder engagement in program management.

ToC frameworks that underlie CGIAR programs often tend to be linear in their approach (IAES, 2025). Evaluating complex food systems interventions may benefit from a **theory of transformation**, which combines multiple ToCs to capture multi-dimensional, cross-sectoral, long-term change. Complexity-aware methods—such as systems mapping, network analysis, system dynamics modeling, and narrative techniques—may be adapted for food systems. Adaptations are expected and should be transparently documented, avoiding changes aimed solely at showing positive impact. Applying evolving designs, real-time feedback, and learning from failures, while maintaining flexibility in methods, timing, budgeting, and staffing, is essential. Where relevant, approaches such as quality improvement, rapid-cycle improvement, and complexity-aware monitoring can track change processes (Neufeld et al., 2024).

There is also ambiguity in many ToC frameworks regarding who is responsible for delivering outcomes given the growing engagement of external partners, particularly at country level. Moreover, budget constraints continue to undermine the potential of transdisciplinary systems work and expanded stakeholder engagement. For example, S4I already scaled back the number of country engagement strategies it can develop from its initial proposal due to funding limitations (S4I Science Program, June 2025).

Disciplinary mix. Multiple past reports recommended that CGIAR's disciplinary mix expand to include more social scientists, and more social scientists beyond economists—such as anthropologists, sociologists, and communication and partnership specialists. However, gaps remain. The underrepresentation of these fields limits CGIAR's capacity for holistic, systems-oriented work (CGIAR Science Council, 2009; Birner & Byerlee, 2016; Barrett, 2008; IAES, 2021; Woltering, 2024, Field Notes (Annex 1). This is not a new challenge but is increasingly urgent as CGIAR's aspirations broaden. Nearly 20 years ago, Michael Cernea warned that marginalizing social science risked undermining the system's operations and performance, particularly as its mandate expanded to include poverty reduction (Cernea, 2005, cited in Cleveland 2008).

In its review of the 2025–30 research proposals, ISDC highlighted the need to more clearly identify capability gaps and recommended adding this step, alongside comparative advantage analysis, to the proposal development process. Where CGIAR lacks in-house expertise, local or international partners could be engaged to fill the gaps. ISDC stressed that channeling resources to partners should not be seen as a drawback; rather, it can foster more intentional partnerships with specialized expertise instead of relying only on existing collaborators (ISDC, 2024; Coccia et al., 2025).

Impact of funding stress. During past periods of CGIAR budget stress, there was a tendency to revert to more traditional, linear research approaches—cutting back on critical enablers of systems research, such as partner engagement—in order to preserve core programs that are seen as more likely to deliver short-term results (IAES, 2021 Field notes, June 2025). Lynam et al. (2024) observe that the weakening of independent science advisory bodies such as the former Technical Advisory Committee, combined with stagnant declining donor funding for international agricultural research (Beintema et al., 2020), pushed CGIAR toward more development-focused research with quicker, visible and quantifiable returns. At the same time, donors also encouraged CGIAR to engage in longer-term food ST at global, regional, and national levels. This persistent tension between short-term outcome expectations and long-term transformation goals led to key programs struggling to secure full funding. As a result, past CRPs such as Humidtropics, FTA, Aquatic Agricultural Systems, Agriculture for Nutrition and Health, and Climate Change, Agriculture and Food Security (CCAFS) were significantly scaled back or discontinued in subsequent CGIAR phases.

4.1.2 How are foresight studies and trade-off analyses used in CGIAR projects (both at development and implementation phases) to support ST?

Scope and use of foresight and trade-off analyses. Between 2022 and 2024, under the ST SG, the Foresight Initiative produced influential global and regional assessments that informed CGIAR and national government research priorities and investment decisions. At global level, for example, the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) was used to estimate the costs of climate change adaptation through agricultural investments (Sulser et al., 2021, cited in Rosegrant, 2024; IAES, 2024).

At regional and country levels, in collaboration with NPS, Foresight strengthened the capacity of partners to use scenario-based tools to anticipate and respond to systemic shocks such as climate change, war, and pandemics. Key investments focused on improving modeling tools such as the Spatial Production Allocation Model, Rural Investment Policy Analysis model, IMPACT, and the Foresight and Rapid Response Modeling System (FARRMS), which supports timely analysis of global shocks. These efforts produced regional foresight briefs highlighting trends shaping the future of FLW systems (PI Science Program, June 2025; CGIAR Annual Reports, 2023; 2024).

Foresight tools—such as scenario modeling, ex ante impact assessments, and risk profiling—will be included in the PI Program to support evidence-based planning for adaptive, resilient food systems. PI plans to put more emphasis on assessing trade-offs and synergies across key sectors and areas including food and nutrition security, water, climate resilience, environmental sustainability, equity, and livelihoods (PI Science Program, June 2025). Other 2025–30 programs, such as B4T, also plan to integrate tailored foresight analyses. B4T plans to apply crop modeling and economic forecasting to anticipate future demand and trait requirements beyond 2035 (B4T Science Program, June 2025).

CGIAR trade-off analysis, developed with country partners, offers tools to help navigate complex policy decisions. For instance, Breisinger et al. (2023) described how NPS collaboration with the Kenyan government highlighted the trade-off between productivity and sustainability around the question of whether the government should continue promoting chemical fertilizers to boost yields or shift toward more sustainable Climate-Smart Agriculture (CSA). While fertilizers can enhance productivity, they carry environmental risks and are exposed to global price volatility—as seen during the Ukraine-Russia war. This analysis underscored the importance of considering CSA as a long-term option, though integrating it into current policy frameworks remains challenging (Breisinger et al., 2023; IAES, 2024).

Between 2022 and 2024, the NEXUS Gains Initiative advanced transdisciplinary water-energy-food-ecosystem (WEFE) solutions in eight countries, using decision-support tools to improve cross-sector planning and build capacity for nexus governance. These efforts helped facilitate inter-ministerial collaboration and informed strategies for scaling climate-resilient, resource-efficient systems. Between 2025–30, these capacities will be integrated into the PI Program under Area of Work (AoW)4 (WEFE Nexus Policy), which will focus on lowering the trade-off costs between water, energy, food, and environmental systems by co-developing trade-off analyses, piloting WEFE solutions, strengthening systems analysis capacity, and supporting governance reforms for managing natural resources under climate and other systemic risks (PI Science Program, June 2025).

The growing focus on foresight and trade-off analyses also reflects ISDC's 2023 review of evolving megatrends and their implications for the 2025–30 Portfolio. ISDC described dynamic, iterative foresight and trade-off assessments as 'indispensable tools' for examining how interconnected megatrends affect FLW systems, as well as for identifying impacts, synergies, and trade-offs across scenarios. It also urged the development of more user-friendly tools to better engage partners in these analyses (ISDC, 2023).

Challenges. CGIAR's policy and institutional work have evolved beyond its traditional agricultural productivity focus. However, greater clarity and resources are needed to help country partners concretely address cross-sectoral trade-offs, including the long-term trade-offs between short-term stakeholder needs and system-wide resilience. The Global Panel on Agriculture and Food Systems for Nutrition Report (2025) and Diaz-Bonilla (2025) note that food ST faces challenges similar to those of past integrated rural development programs, which struggled with complex inter-agency coordination. Institutional weakness and fragmentation in low- and middle-income countries (LMICs) remain major barriers to implementing multisector, multi-actor efforts. Effective transformation requires a clear vision, aligned budgets, and local delivery systems—not just institutional restructuring. However, widely accepted models for such programs are lacking, and CGIAR's comparative advantage in this area remains uncertain (Diaz Bonilla, 2024).

Model improvements needed. Rosegrant et al. (2024) highlight key limitations in current models, particularly their inconsistency in capturing increased variability and the effects of extreme events on food security and agricultural productivity. While advances in computing are beginning to enable better modeling of extreme event frequency—allowing comparisons of interventions not just by yield gains but also by resilience to shocks—this area remains underdeveloped. Some progress has been made in incorporating feedback, such as livestock productivity losses into bioeconomic models, but other areas, including aquaculture, are still largely excluded from climate impact modeling.

4.1.3 To what extent are Impact Areas (environment, livelihoods, equality, nutrition, and climate) embedded into CGIAR program design, assessment, and reporting? What challenges or good practices have been observed?

SG Evaluations found notable progress in mainstreaming climate change and nutrition, particularly through Initiatives such as the CGIAR Initiative on Climate Resilience, Mitigate+, SHiFT, and FRESH. However, integration of other Impact Areas was uneven—especially livelihoods, youth, and social equity. The RAFS SG Evaluation also noted a concerning fragmentation of key cross-cutting themes—such as food safety, One Health, and postharvest losses—across Initiatives (IAES, 2024a).

Looking ahead, the 2025–30 Research and Innovation Portfolio shows promising collaboration—such as among the B4T, S4I and Better Nutrition (BN) programs—but lacks clear mechanisms to mainstream nutrition and other Impact Areas across programs. Trade-off analyses need to place greater emphasis on assessing how alternative pathways affect different Impact Areas, and on designing interventions that address inequality risks related to food ST and climate change (Rosegrant et al., 2024). The Gender Equality and Inclusion Accelerator is expected to be a key partner for addressing equity concerns, but CGIAR's limited disciplinary mix and difficulty in partnering hinders broader inclusion (Coccia et al., 2025).

The ISDC praised the new SF program for its holistic approach, drawing on past Initiatives and aligning with all five CGIAR Impact Areas. It highlighted the program's strong cross-disciplinary methods, use of digital tools, effective delivery strategies, and meaningful linkages with other programs (ISDC, 2024). However, it is worth questioning whether it is necessary—or strategic—for every research program to address all five Impact Areas. With stronger cross-program coordination at country level, Portfolio-wide coverage of Impact Areas could be achieved more efficiently, without requiring each program to address them equally. In practice, the 2022–24 SG Initiatives varied in their coverage of Impact Areas (IAES, 2024b). Expecting all 2025-30 programs to address every Impact Area—or to establish their own country-level stakeholder engagement mechanisms—could dilute resources and reduce overall effectiveness.

4.1.4 What gaps in systems research has CGIAR identified and addressed, especially beyond technological solutions? How are environmental and institutional dimensions included?

The related question—*What progress has been made in strengthening CGIAR's capacity in systems research?* —is addressed in this section. Since both questions focus on the development of systems research and CGIAR's capacity in this area, they are discussed together.

Scaling and systems research. CGIAR has placed growing emphasis on both scaling and systems research in recent years. While scaling focuses on expanding the adoption and impact of specific innovations, systems research takes a broader, more integrated approach—examining how different parts of a system interact and how sustainable change can be achieved within this complexity. These approaches are not opposites, but complementary: scaling targets reach and replication, while systems research emphasizes context, interconnections, and transformation (Kohl & Vance, 2022). In addition, expanding the reach of innovations is not equivalent to addressing the structural and interconnected challenges that define food ST.

Critics argue that conventional scaling efforts are overly linear in nature and often overlook the institutional, policy, and social systems required to sustain impact. Without addressing these systemic barriers, scaling risks the reinforcing existing inequalities or delivering only incremental gains—insufficient for tackling global challenges such as SDGs (Woltering, 2024). This perspective is supported by SPIA's long-term analyses of CGIAR innovation reach in different countries. These analyses found that enabling environments (such as state policies and public investment) were essential to sustaining adoption in countries like Ethiopia and Bangladesh (Alemu, 2021; Ilukor, 2025; Stevenson, 2025). In other cases (Uganda, Ethiopia), sustained adoption did not follow the anticipated path, indicating that more work is needed to understand the interplay of behavioral and enabling environment features that influence adoption patterns.

At the core of the debate is a trade-off between practicality and ambition. Proponents of traditional scaling favor pragmatic, time-bound approaches that adapt innovations to existing systems and focus on specific constraints, typically aiming for results within five–fifteen years. Systems change advocates, on the other hand, argue that lasting impact requires broader transformations in political, institutional, and social structures (Kohl & Vance, 2022; Kohl & Vance, 2021; Woltering, 2024).

These differences have operational consequences. System approaches often require extensive mapping, inclusive stakeholder engagement, and long-term strategies —challenging to implement in resource-constrained settings including CGIAR. Scaling approaches typically limit engagement to essential actors and focus on overcoming immediate barriers. Critics of systems approaches warn of paralysis by analysis, while advocates caution that ignoring complexity can result in shallow or unsustainable outcomes.

A pragmatic middle ground appears to be gaining traction—one that integrates systems thinking into scaling strategies where appropriate. This blended approach, exemplified by the Scaling for Impact Accelerator (2025-30 Portfolio), involves assessing what level of systems change is both necessary and feasible, based on context and objectives (Kohl & Vance, 2022; Woltering, 2024; S4I Science Program, June 2025).

Achieving the large-scale, lasting impact in agri-food systems that is at the heart of CGIAR's 2030 Research Strategy will require balancing the efficiency of scaling with the depth of systems understanding. Scaling must consider the broader ecosystem in which innovations are launched, and systems approaches must be grounded in practical considerations of what can realistically be changed. For CGIAR,

this means aligning innovation delivery with systemic insight—particularly when addressing complex challenges such as climate resilience, equity, and sustainability.

Scaling opportunities and constraints. During 2022-24, RIIs were designed to act as key vehicles for co-design, co-delivery, capacity development, policy change, and scaling, working closely with local and regional partners. Their role was to serve as innovation brokers—scaling CGIAR innovations generated under Global Thematic Initiatives (GTI) and channeling demand from regional stakeholders back to GTIs and across SGs. Examples such as the Ukama Ustawi Initiative (2022-25), with its Food System Accelerator Program and internal Scaling Fund, demonstrated the potential of RIIs to provide direct pathways for impact. However, the partnership model between GTIs and RIIs did not function as intended. Roles overlapped, with both RIIs and GTIs engaging in research and scaling activities, leading to duplication rather than complementarity. Weakly designed mechanisms for reciprocal engagement, lack of clear guidance, rushed proposal development, and research-focused templates further undermined coherence. As a result, RIIs often developed stand-alone research projects rather than facilitating integration, and minimal regional-level impact analysis left unclear how work package outcomes would trigger wider regional impact (IAES, 2024a).

In the 2025-30 Portfolio, the S4I program attempted to address some of the challenges outlined above. It more clearly demarcated its role in service provision and not research (S4I Inception Report, 2025). During the inception period, S4I bundled validated innovations from across CGIAR programs and centers into delivery models aligned with national priorities, and began to coordinate with key organizations and platforms such as TAAT to link innovations to large-scale investments. S4I also indicates in the Inception Report its intention to embrace a co-creation model, viewing scaling as a continuous, adaptive process, not a fixed end stage. It emphasizes feedback loops, learning, and system alignment rather than linear rollout. This will be important to address the findings of the SPIA impact studies, which showed how reach of innovations changed over time across countries depending on national and local conditions (Alemu, 2024; Ilukor, 2025).

S4I's ambition as a system-level scaling aggregator is commendable but may be unrealistic without a more pragmatic strategy. In its proposal review, ISDC cautioned that goals such as mobilizing USD 5 billion in International Financial Institution (IFI) financing can lack feasibility analysis, and risk being undermined by institutional and political economy barriers. The proposal also underestimates the technical capacity, staffing, and instruments required to support tens of large-scale projects, and provides insufficient clarity on risk management, MELIA, and the Scaling Strategy Support Team. ISDC recommended a phased, partnership-driven approach, with stronger risk mitigation and attribution frameworks, to make the Initiative more feasible and effective (ISDC, 2024).

S4I's Inception Report notes that CGIAR budget constraints are already hindering its ability to coordinate programs under a unified scaling strategy, as center-controlled resources continue to favor existing Initiatives. Without broad recognition of S4I's system-wide mandate, the risk of continued siloed operations across programs remains high (S4I Science Program, June 2025).

Gaps in systems research and integration. While environmental health and biodiversity are core to CGIAR's mission, their integration across programs—especially in SF, MFL, and SAAF in the 2025-30 Portfolio—remains insufficient (ISDC, 2024). For example, the SAAF Inception Report suggests that resource management, land degradation and tradeoffs/synergies between livestock/aquatic and mixed cropping systems will primarily be addressed by SF and MFL. However, these important issues are not as visible as they could be in the SF and MFL proposals and Inception Reports; this should be strengthened (SAAF, SF, MFL inception reports, 2025). It is essential to strengthen engagement among these three programs—and

with key Initiatives such as B4T—to foster synergies, prevent duplication, and make the most of limited resources (ISDC, 2024).

B4T and S4I programs in the 2025-30 Portfolio provide only limited attention to neglected crops and pulses, which are vital for nutrition, climate resilience, gender-responsive transformation, and soil health. For example, enhancing nutritional value of crops, resilience to drought and improving yields on marginal soils may be feasible by researching and developing crops that are not mainstream, but locally important (ISDC, 2024).

The 2030 Research Strategy places equal weight on FLW systems., Yet, despite its strategic importance, water receives limited attention across the 2025-30 Research Portfolio (ISDC, 2024). With climate change increasingly affecting water resources, prioritizing research on sustainable water use, conservation, and management practices would enhance the Portfolio's capacity to address climate challenges and foster more resilient agricultural and food systems (ISDC, 2024).

As noted earlier in this summary, CGIAR's internal expertise in social sciences and systems thinking remains limited. During the CRPs and 2022-24 Initiatives, external partners such as Wageningen University were tapped to supplement limited CGIAR internal expertise in systems. This is a strategy that could be employed more broadly, as modeled by the strong partnerships that contributed to the CRP on Climate Change, Agriculture and Food Security's (CCAFS) success in rapidly accelerating CGIAR climate-related work during the CRP era. However, the continuing difficulty that external international and local organizations face in partnership with the CGIAR represents a significant barrier to this approach (IAES, 2021; IAES, 2024a; IAES, 2024b).

Research Portfolio monitoring and evaluation systems are often fragmented, overly focused on outputs, and poorly equipped to capture factors that are important for long-term, systemic change such as progress in developing strategic partnerships and devolving responsibility to national partners. The 2022–24 Initiatives tracked little quantitative progress toward outcomes (IAES, 2024a; IAES, 2024b). A persistent challenge also noted for the CGIAR Research Programs (2011-21) is the reliance on linear ToCs that fail to reflect system complexity (IAES, 2025; IAES, 2024b; IAES, 2021).

5 Key Learning: Multiple Transformation Pathways

Several points from the previous section on the ST WoW also apply here. Only additional lessons are highlighted below to avoid repetition.

5.1.1 What types of transformation pathways and innovations has CGIAR identified and shared across diverse FLW systems?

Both SI and agroecological systems were central to CGIAR's research agenda for over a decade as key pathways to ST, although they are often perceived as competing pathways (Fischer et al., 2025; Bernard et al., 2015).[3]

[3] The debate between Sustainable Intensification (SI) and agroecology reflect different visions of how to make agriculture more productive, resilient, and sustainable. SI emphasizes producing more with fewer resources, often

Sustainable Intensification. SI focuses on introducing innovations that not only boost productivity but also generate positive environmental outcomes to address resilience and sustainability challenges (Godfray & Garnett 2012; Cassman & Grassini, 2020, cited in ISDC, 2020). In the 2025-30 Portfolio, the SF Initiative builds on three 2022–24 programs to support farmers in transforming their systems for greater agronomic gains and whole-farm management.

SF will take an integrated approach centered on women and youth, combining agronomy, plant health, and systems solutions to improve farm advisory services, enhance response to biotic and abiotic shocks, and address key production constraints (e.g., soil, water, pests, markets), including through the integration of AI data and analysis (SF Science Program, June 2025).

SF will build on the **Partnerships for Accelerating Agricultural Solutions at Scale (PAASS) platforms** developed in 2022–24 to co-create solutions with partners, strengthen farm advisory services, and scale innovations. These platforms will help identify key biophysical and socio-economic constraints and shocks, support integrated responses, and serve as strategic entry points for scaling. SF's integrated approach—centered on women and youth—intends to combine agronomy, plant health, and systems solutions, including AI-driven analysis, to address soil, water, pest, market, and shock-related challenges (SF Science Program, June 2025).

In its review of the SF proposal, ISDC praised the program for building on lessons from past Initiatives and for leveraging CGIAR and partner knowledge, institutional progress, and technologies. It commended SF's focus on bundled solutions, interdisciplinarity, digital and data tools, cross-cutting issues, strong delivery mechanisms, and planned linkages with other programs. However, as with other 2025–30 proposals, ISDC questioned the extent and quality of farmer engagement in co-design, and how gender and inclusion would be addressed across program areas. It also noted gaps in attention to water management in rainfed systems, unclear plans for soil health improvements, and the absence of risk analysis at all levels (ISDC 2024).

Agroecology. The United Nations Food and Agriculture Organization defines agroecology as a holistic and integrated approach that combines ecological and social principles to strengthen the resilience, equity, and sustainability of food systems.[4] CGIAR's agroecology approach is transdisciplinary, participatory, and action-oriented, aiming to design and manage sustainable food and agriculture systems.

For the 2025-30 Portfolio, the MFL program integrates four 2022-24 Initiatives (MFL Science Program, June 2025). A defining feature of CGIAR's agroecological research is its work within local Living Labs across multiple countries, where stakeholders collaborate to co-create and test innovations. Past examples include a Living Lab in Qingshan village in South China, which aligned local actors with national low-emission goals, promoting practices like composting and sustainable rice production (Habermann et al., 2023). In Madhya Pradesh, India, agroecology visioning with farmers, government, private sector, and researchers identified needed innovations, policies, and behavior changes (Habermann et al., 2023; Singh & Freed 2024, cited in MFL Science Program, 2025).

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through improved seeds, precision technologies, and efficiency gains, while aiming to reduce environmental impacts. Agroecology promotes redesigning farming systems based on ecological principles, local knowledge, and diversification, emphasizing equity, farmer agency, and systemic change. Critics of SI argue it can reinforce input-intensive models and overlook social and ecological dimensions, while skeptics of agroecology question its scalability and ability to meet global food demand. Increasingly, the two are seen as complementary rather than opposing, with calls to integrate efficiency-driven approaches from SI with the systemic, equity-focused principles of agroecology to support food ST (Fischer et al., 2025; Bernard et al., 2015).

[4] For more information, see the Agroecology Knowledge Hub.

ISDC highlighted the need for stronger integration across AoWs in MFL, recommending that policy, gender, and education be embedded within fewer, more focused areas. Clearer links between performance assessment and core research themes are required, along with greater clarity on how fragmented areas such as carbon and ecosystem services markets will be addressed. ISDC also suggested that strategies for scaling need to be defined, and comparative advantage assessed. The MELIA framework and risk analysis need further development to enable effective tracking and adaptive management (ISDC, 2024).

Challenges. Both SI and agroecology approaches require substantial cross-disciplinary integration, which has proved difficult for CGIAR to achieve and sustain, although progress was made during 2022-24 (IAES, 2024a; IAES, 2024b). For example, the ST SG Evaluation identified weak integration across biophysical, social, and economic sciences as a barrier to addressing climate vulnerability along value chains. The climate case study noted fragmented strategies, limited coordination, and a focus on academic outputs over practical impact. Misaligned policy timelines and poor cross-sector collaboration reduced effectiveness. Overcoming these challenges calls for more coherent strategies, early co-design, and stronger regional and cross-program coordination (IAES, 2024b; IAES, 2024c).

In their review of CGIAR's agroecology efforts, Freed et al. (2024) stressed the need to engage actors across the entire value chain—not just producers—to address structural barriers. They highlighted a key design flaw: the lack of a systems or enabling environment lens, which limited recognition of off-farm constraints such as weak market access, unfavorable policies, and social norms that hinder equitable participation. Market and value chain linkages, frequently cited as critical enablers or barriers, were found to significantly affect the success and sustainability of agroecology Initiatives.

Partnership development and country engagement activities appear to be disproportionately impacted by ongoing CGIAR budget reductions. SF's AoW7, which focuses on facilitating co-design of whole-farm innovation bundles with farmers and other partners, had a reduced budged by 50% (SF Science Program, June 2025).

The 2021 CRP synthesis neatly encapsulated the ongoing struggle within CGIAR as follows (IAES, 2021):

> The 2020 evaluative review of the CCAFS program found that the most forward-looking strategic research focused less on developing specific technologies and more on understanding how to enable adaptation, resilience, and mitigation—highlighting the importance of delivery science and social learning. Similarly, the CRP on Water, Land and Ecosystems (WLE) and other systems-oriented CRPs, such as Humidtropics, emphasized the need for inclusive processes that connect science with development by engaging diverse stakeholders to build shared understanding around landscape and agricultural management options (CGIAR-IEA, 2016). However, the skills and engagement required to achieve impact at scale differ significantly from the typical training of CGIAR scientists. Efforts to diversify expertise and sustain the necessary resources for meaningful partner engagement were inconsistent and largely inadequate.

5.1.2 How is CGIAR engaging with research users (methods or partnerships) to improve understanding of the benefits, costs, and risks of different options for change?

The related questions — (i) *What evidence was generated through economic and social sciences research on incentives and drivers influencing different transformation pathways?* and (ii) In what way is CGIAR helping stakeholders navigate and choose between competing transformation options in context-specific ways? — are also addressed in this section.

The following discussion brings these three questions together, focusing on how CGIAR generates and shares evidence with research users to inform context-specific decision-making and transformation choices.

The previous section discussed two key methods used by the SI and agroecology research Initiatives to engage, co-create, and analyze the benefits and risks of alternative options with farmers and other partners: the PAASS platform, and Living Landscapes. Other examples include:

During 2022-24, **Foresight and NPS initiatives** built on longstanding relationships to effectively engage with strategic policy partners in their focus countries. Foresight worked with regional technical partners such as the Chinese Academy of Agricultural Sciences, the Indian Council of Agricultural Research, the Bureau for Food and Agricultural Policy in South Africa, the Brazilian Agricultural Research Corporation , the National Research and Innovation Agency in Indonesia, and the Institute for International Agricultural Negotiations in Argentina to support capacity sharing, information exchange, and improved agrifood system foresight and outlook work in their countries as well as regionally and globally (CGIAR Initiative on Foresight, 2025).

In addition, the Foresight initiative partnered with regional policy networks such as the African Network of Agricultural Policy Research Institutes and its member centers to strengthen capacity, conduct joint research, and inform decision making by national governments. Similar partnerships were more recently established with the South Asia Network on Economic Modeling (IAES, 2024b; CGIAR Initiative on Foresight, 2025).

In NPS, long-term in-country presence and day-to-day interactions allowed the Initiative to co-create research and adapt models and analytical tools to local conditions while building the capacity of local partners. For example, the food security simulator developed for Nigeria uses a robust tool in Excel that can be learned in an hour and allows users to quickly assess, e.g., the impact of a price shock on food security and dietary diversity, instead of running complex code in a programming language that needs to be learned. Long-term in-country presence was also key to help institutionalize this capacity in local think tanks through established modeling units, e.g., in Egypt and Kenya, that are funded by the countries themselves (IAES, 2024b; CGIAR Research Initiative on National Policies and Strategies, 2025).

The SHiFT and FRESH initiatives (2022-24) examined political economy, behavioral, and market incentives driving diet diversification and consumer behavior, in its focus countries, SHiFT worked directly with partners mandated to develop and implement the food ST agenda, including its support for Vietnam and Ethiopia. **SHiFT and FRESH**, as well as the CGIAR Initiative on **Resilient Cities** have also expanded CGIAR research and influence in the new area of food environments. Working with partners, SHiFT collected detailed quantitative and qualitative data on the food environment, consumer behavior, and the political economy. In Vietnam and other focus countries, SHiFT laid the foundation with strategic partners to create narratives based on the data to help identify entry points for improving healthy food intake and discourage unhealthy food intake (IAES, 2024b).

FRESH, like SHiFT, also focused on increasing knowledge of how food environments and food systems work, but used its unique end-to-end approach that connects the entire value chain from GI, variety and agronomic improvement through to marketing and consumer demand. Its innovations included new vegetable varieties developed in collaboration with private sector partners and improved horticultural practices. FRESH also worked with food vendors on innovations to incorporate nutritious vegetables into fast foods in ways that are accessible to low-income consumers. Through its participation in high-level food ST and nutrition bodies in focus countries, FRESH began to raise the profile of vegetables and offer practical guidance and context-specific innovations to make them more accessible and affordable (IAES, 2024b).

5.1.3 How is CGIAR using tactical entry points to support system change through science, rather than trying to address entire systems at once?

See the discussion under questions 4 and 5 above under ST.

6 Key Messages & Looking Forward to the 2025-30 Portfolio

Key Messages: ST

- Ambitious but fragmented: CGIAR's 2022–24 SG Portfolio embraced ST but lacked a common definition, consistent country engagement, and clear cross-program coordination.
- Interdisciplinary progress: Programs applied multi-, inter-, and transdisciplinary approaches, with promising examples such as Agroecology's Living Labs and FRESH, but integration across biophysical, social, and economic sciences remains uneven.
- Country responsiveness limited: Engagement improved in some contexts (e.g., Vietnam, Uganda) but was mostly consultative, not co-designed, and was constrained by weak convenor roles, unclear mandates, and budget stress.
- Foresight value recognized: Global and regional foresight assessments informed investment priorities and trade-off analyses, but models still fall short in capturing variability, extreme events, and neglected sectors like aquaculture.
- Impact areas unevenly embedded: Climate and nutrition received more attention; equity, livelihoods, and youth lagged. Without better cross-program coordination, requiring every Initiative to cover all five Impact Areas risks dilution.
- Scaling tensions: A blended approach—integrating scaling with systems thinking—is emerging (e.g., S4I), but feasibility concerns, resource constraints, and unclear comparative advantage threaten effectiveness.

Key Messages: Multiple Transformation Pathways

- Two dominant approaches: Sustainable intensification and agroecology remain CGIAR's main pathways, but require stronger integration across disciplines, value chains, and enabling environments.
- Innovative entry points: Platforms like PAASS and Living Labs show potential for participatory co-design and scaling, but risk under-funding and weak farmer engagement.
- Evidence for users: Foresight, NPS, SHiFT, and FRESH built strong partnerships and delivered policy-relevant tools, but economic and social science capacity gaps limit deeper analysis of Incentives and drivers.

Looking Forward to the 2025-30 Portfolio

1. Clarify CGIAR's role in ST by developing a cross-system strategy that defines common principles, approaches, and realistic scope.

2. Strengthen co-design and country responsiveness through formalized convenor roles, longer-term capacity sharing, and true partnership rather than consultation.
3. Improve program coherence by mapping hubs, labs, and Initiatives across programs to identify synergies, avoid duplication, and ensure coverage of all impact areas at Portfolio level.
4. Invest in foresight and trade-off tools that better capture variability, extreme events, water systems, and neglected crops, while ensuring usability for partners.
5. Expand the disciplinary mix—especially social sciences beyond economics—and use partnerships to fill expertise gaps.
6. Balance scaling and systems approaches by adopting phased, partnership-driven strategies with robust MELIA and risk frameworks to track adaptive change.
7. Secure adequate and predictable funding to sustain transdisciplinary research, participatory engagement, and delivery science, avoiding reversion to short-term, linear approaches under budget stress.

CGIAR is shifting toward a more integrated and context-responsive approach to ST and scaling. To succeed, it must strengthen interdisciplinary capacity, institutional coordination, and long-term partnerships—particularly at country level.

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Annex 1. Summary of Field Notes from Uganda

In June 2025, two members of the Ways of Working (WoWs) summary research team visited Uganda, where several CGIAR programs are active. During the visit, members engaged with CGIAR researchers and other stakeholders to gather insight on how WoWs are being translated into concrete research activities. Key insights from these discussions are referenced throughout the summary report, while the notes below provide a fuller account of the conversations and takeaways most relevant to the Systems Transformation (ST) WoW and Multiple Transformation Pathways WoW.

Discussions in Uganda with 43 participants—including CGIAR center staff, partners, the private sector, development banks, development organizations, and farmers—highlighted a broad range of activities reflecting both interdisciplinary research and cross-sectoral collaboration within and across CGIAR centers and with external partners. Evidence of interdisciplinary teamwork was clear: for instance, CGIAR centers and Uganda's NARO shared examples of integrating research teams (including breeders, social scientists, economists, and gender experts) to jointly design and implement projects to achieve multiple benefits. International Livestock Research Institute (ILRI) noted that when its Uganda office opened in 2012, departments worked largely in silos, but experience has since led to a more integrated, interdisciplinary approach. Similarly, International Food Policy Research Institute (IFPRI) reported moving beyond policy recommendations by using collected nutrition data to develop mitigation strategies, including the introduction of biofortified crop varieties—an effort that extends policy research into broader food ST.

However, several challenges were noted in translating systems research into systems change. Participants highlighted that top-down project design and implementation often undermined collaboration, while limited co-design and weak alignment with national research priorities reduced relevance, ownership, and efficiency in resource use. Abrupt project closures and the downsizing of critical functions, such as social sciences, were seen as inconsistent with CGIAR's commitment to integrated, interdisciplinary research. Heavy reliance on external technical expertise also raised concerns about balancing the use of global knowledge with building local and regional capacities. These issues suggest missed opportunities for deeper collaboration and integration across centers, particularly where similar expertise already exists within the region but in different centers.

Beyond CGIAR, partners from the private sector, development agencies, and development banks reported crosscutting Initiatives and research spanning the entire food system. Integrating breeders, manufacturers, distributors, marketers, and innovators was seen as adding significant value to food systems work. Some private actors, such as EzyAgric, have formal engagement frameworks that include sharing learning data with CGIAR centers such as the Alliance of Bioversity and International Center for Tropical Agriculture (CIAT), helping to inform future program design. AfricaRice, through its Sustainable Productivity Enhancement program, identified major gaps in the rice value chain—notably high post-harvest losses at the milling stage despite strong regulatory frameworks. This weakness undermines shared goals between government and CGIAR on food security and highlights the need for technological solutions in mechanization and post-harvest handling capacities, particularly from private sector actors.

Annex 2. Reviewed Programs and Accelerators Proposals –Inception Reports (June 2025)

Table 1. Reviewed Programs and Accelerators Proposals

S/No	Program	Abbreviations used in this report
1.	Breeding for Tomorrow	B4T
2.	Better Diets and Nutrition	BDN
3.	Capacity Sharing	CapSha
4.	Climate Action	CA
5.	Digital Transformation	DT
6.	Food Frontiers and Security	FFS
7.	Gender, Equality and Inclusion	GEI
8.	Genebanks	GB
9.	Multifunctional Landscapes	MFL
10.	Policy Innovations	PI
11.	Scaling for Impact	S4I
12.	Sustainable Animal and Aquatic Foods	SAAF
13.	Sustainable Farming	SF

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