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CGIAR Science Group Evaluations: Brief on Climate Change

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CGIAR Independent Advisory and Evaluation Service

Science Group Evaluation Portal

The CGIAR 2030 Research and Innovation Strategy identifies adaptation and mitigation as one of five SDG-focused impact areas. The Strategy suggests how CGIAR's research, innovation, and capacity development can contribute toward achieving collective global targets for climate change adaptation and mitigation. The CGIAR's action on climate change addresses the risks to food systems, the impact of food systems emissions, and the potential for integrated solutions.

Under the 2022-24 Portfolio, the three Science Groups (SGs)[1]—Genetic Innovation (GI), Resilient Agrifood Systems (RAFS), and System Transformation (ST) were delivered through 33 Initiatives.

This brief highlights evaluative insights and lessons on climate change from the GI, RAFS, and ST SG evaluations. The full report is available upon request.

The Independent Advisory and Evaluation Service (IAES), conducted the three SG evaluations under the 2022–24 Multi-Year Evaluation Workplan (2021; re-confirmed 2024) and in alignment with the evaluations' Terms of Reference (ToR). The evaluations followed CGIAR's Evaluation Framework and Policy and integrated both **formative and summative approaches** to support learning, steering, and accountability, specifically to support CGIAR evidence-based efforts to adapt to the 2025–30 CGIAR Portfolio.

The *mixed methods design* (qualitative and quantitative data collection) included: desk research; six field visits (Kenya, Ghana, Bangladesh, Colombia, Vietnam and USA)(Figures 1 and 2); 362 key informant interviews (virtual and in-person); focus group discussions; portfolio analysis; and an online survey.

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

Box 1. *CGIAR collective global 2030 targets for climate adaptation and mitigation.*

The evaluations were aligned with the Quality of Science (QoS) Evaluation Guidelines and addressed the QoS evaluation criterion, which included interviews, case studies, deep dives, and a review of sample of scientific outputs. Of the 11 case studies, two focused on climate change: Strengthening Resilience to Climate Change, as part of the ST SG report; and Climate Change Mitigation/Adaptation Across

[1] Stem from the CGIAR 2030 Research and Innovation Strategy. Between 2022-23, the 2030 CGIAR Research Portfolio was comprised of 33 Initiatives across three Action Areas (i.e., Science Groups).

Different SG Initiatives and WPs, under the RAFS SG evaluation.

For real-time learning, the evaluators engaged stakeholders using a **participatory approach** to data collection to identify critical issues and good practices. The Synthesis and three SG evaluations also considered the 2021 Synthesis of Learning from a Decade of CGIAR Research Programs as a backdrop.

Key Findings

Learnings related to climate adaptation and mitigation are organized by the five evaluation criteria with subsequent recommendations and actions. CGIAR's climate adaptation and mitigation research has significantly contributed to global climate resilience through high-quality science. Notably, strengthening interdisciplinary collaboration, improving research integration, and enhancing impact assessment mechanisms would be crucial to sustaining CGIAR's leadership in climate science. By addressing key challenges, CGIAR can advance its role in informing science-based climate solutions for food systems and beyond.

Relevance

CGIAR's climate-related work responds to global priorities, including the Sustainable Development Goal (SDG) 13 and the commitments under the United Nations Framework Convention on Climate Change.

The ST SG exhibited strong alignment with international climate resilience priorities, including those outlined in Intergovernmental Panel on Climate Change's Sixth Assessment Report, while also addressing national and local vulnerabilities, particularly in low- and middle-income countries.

At national and regional levels, the relevance of CGIAR's work varied by the applicability and scalability of research findings, solutions, and innovations. Regional Integrated Initiatives (RIIs) were designed to function as key vehicles for scaling innovations, policy change, and capacity development in collaboration with regional and national partners. However, given with the 2022 launch of the RIIs in 2022, it is early to determine the extent of their fulfillment of the role.

Quality of Science[2] (QoS Synthesis)

The SG evaluations found that, while management processes generally ensured the credibility, legitimacy, and relevance of research, they were affected by constraints on consultation time during the design phase. Additionally, weak collaboration between initiatives reduced the synergy needed to integrate mitigation strategies into modeling and policy frameworks, limiting their applicability.

Quality challenges persist, including insufficient field trials for adaptation technologies, weak incorporation of GHG metrics into foresight tools, and inadequate integration of socio-economic factors. The absence of unified intellectual property guidelines also occasionally strained research partnerships, affecting collaboration.

A key challenge to maintaining high-quality science in climate research is the adequacy of research inputs: funding, infrastructure, and expertise. CGIAR's climate-focused Initiatives faced funding uncertainties, which impact research continuity and the ability to retain critical expertise. The evaluations identified gaps in social science, policy analysis, behavioral science, and climate modeling expertise, limiting interdisciplinary approaches.

Climate resilience Initiatives under the ST SG demonstrated strong methodological robustness, with interdisciplinary approaches reinforcing scientific credibility. Peer-reviewed publications in high-impact journals, coupled with Altmetric Attention Scores and downloads, underscored the global relevance and influence of CGIAR's climate research. The Climate Impact Area Platform played a key role in linking CGIAR scientists to global climate platforms. There remains significant potential for expanding engagement within the CGIAR network.

Scientific quality is reinforced through structured management processes, particularly in defining research priorities, designing studies, and engaging with stakeholders. However, inconsistencies in stakeholder consultation at the research design phase were noted. Some Initiatives effectively co-designed studies with national partners, while others faced constraints that limited meaningful engagement. Gaps were identified in the representation of adaptation technologies across diverse agro-ecological zones. Greenhouse gas (GHG) metrics have had limited incorporation into foresight modeling and

[2] For more details on QoS, see the QoS Brief, the QoS Synthesis, and the SG Evaluations Portal.

digital tools, and this has weakened the applicability of research findings to mitigation strategies.

CGIAR has produced a significant number of high-quality outputs, which include peer-reviewed publications, policy briefs, datasets, and decision-support tools. A 2024 study of 105 peer-reviewed knowledge products highlighted a growing focus on solutions with 53 addressing climate adaptation and mitigation, 40 focusing on new methodologies, and 44 examining climate change impacts.

A **key limitation** in assessing CGIAR's climate-related scientific quality is the lack of standardized metrics for evaluating the impact of non-peer-reviewed outputs. Other challenges included:

- Limited interdisciplinary collaboration, particularly between biophysical and social sciences, reducing the comprehensiveness of climate research.
- Weak integration of adaptation and mitigation strategies, restricting the development of holistic climate solutions.
- Inconsistent stakeholder engagement, with time constraints often limiting meaningful consultation during research design.
- Limited representation of adaptation technologies across diverse agro-ecological zones, affecting the generalizability of findings.
- Insufficient incorporation of GHG metrics into foresight modeling and digital tools, restricting comprehensive mitigation assessments.
- Weak integration of socio-economic considerations, such as gender and equity, into mitigation research.
- Lack of standardized intellectual property and authorship guidelines, sometimes leading to tensions in research partnerships.
- Short and uncertain funding cycles, impacting research continuity and the ability to retain critical expertise.

Effectiveness

Climate change adaptation and mitigation were systematically considered in the design of Initiatives, particularly under the ST and RAFS science groups. Initiative proposals included dedicated impact statements explaining how their activities contribute to CGIAR's climate impact area. The understanding of the roles of the three SGs in relation to CGIAR's five impact areas was unclear.

The Climate Impact Area Platform was designed to facilitate systematic collaboration across Initiatives, bringing together researchers and fostering linkages with external partners. Nearly 600 scientists from 12 CGIAR Centers joined the Community of Practice (CoP, established in 2023). The limited clarity on the Platform's engagement with SGs and Initiatives weakened its ability to drive integration. Challenges related to scalability readiness limited the broader transformative impact. The Platform's effectiveness was constrained by its late start, short duration, and implementation challenges.

The SG evaluations found meaningful delivery and scaling toward climate objectives across all CGIAR regions. Many of the 2022-2023 results built on work delivered under CGIAR Research Programs (CRPs), with expectations for the 2022 portfolio to yield longer-term impacts. While climate Initiatives quantified their projected contributions to the global climate targets, systematic reporting against these targets is lacking.

The tagging of climate-related outputs on the CGIAR Results Dashboard was a useful mechanism for organizing and accessing relevant research. It was not comprehensively applied, and the lack of distinction between adaptation, mitigation, and maladaptation limited its analytical utility.

A theory of change (ToC) analysis in the Genetic Innovation (GI) SG Evaluation Report revealed that critical causal assumptions about the contribution of Initiatives and significant research outputs to the achievement of early outcomes at crop breeding programs level (CGIAR and NARES) were not sufficiently explored or made explicit from the outset, nor throughout the implementation process, despite ToC revision. The 2024 EA Synthesis also noted that, while assumptions were identified as crucial for program success, they were not deeply explored, particularly those concerning human behavior, the adoption of research results, and socio-economic realities.

Coherence and Efficiency

Four in five (80%) survey respondents supported the development of a dedicated climate change strategy to improve integration across Initiatives.

While the new SG framework improved cross-Center collaboration, ST still faces challenges in integrating biophysical, social, and economic sciences to address climate resilience holistically. This gap limits comprehensive solutions to climate vulnerability across value chains.

Similarly, the GI SG evaluation found that insufficient consideration of cropping systems risks misalignment with RAFS and ST groups, missing opportunities to enhance climate resilience, nutrition, and environmental health.

Unlike the former CRP structures, the new SG framework helped cross-Center collaboration within Initiatives by pooling diverse expertise and funding. Remaining challenges include siloed operations, competition for resources, and inconsistent coordination between Initiatives working on similar topics. Discrepancies between planned and approved funding further constrained implementation, leading to reductions in geographic scope and ambition in some Initiatives.

Recommendations and Recommended Actions

Three recommendations across the three SG evaluations directly relate to climate change:

- Build on CGIAR's comparative advantages in climate resilience research: **mainstream climate adaptation and mitigation across the entire portfolio** by continuing to provide evidence of the transformative impacts of national policies and strategies in building the resilience of FLW systems to climate change, using integrated systems frameworks (ST SG, Rec. 7).
- **Develop incentives for interdisciplinary team collaborations** across Centers to tackle interconnected issues effectively under the integrated management framework. Continue using platforms and CoPs to promote collaboration across all science programs and accelerators, fostering a holistic approach to reducing food system vulnerabilities to climate change (ST SG, Rec. 3).
- **Integrate genetic gains into broader contexts**: Combine crop improvement with agronomy and plant health research, promoting crop and varietal diversity for resilience and environmental health (GI SG, Rec. 5c). Expand research and dissemination of climate-resilient crop varieties and adaptive farming systems. Strengthen prediction models.

The recommended actions from case studies:

- **Strengthening the tagging and classification of climate-related outputs** to improve tracking, synthesis, and accessibility of research findings, ensuring that information is systematically categorized for better utilization.
- **Building on CGIAR's comparative advantage in climate resilience research** by mainstreaming climate adaptation and mitigation across the entire research portfolio, integrating climate action into all thematic areas, and ensuring robust methodologies for measuring climate impact.
- **Enhancing interdisciplinary collaboration and cross-sector linkages** by fostering stronger connections between climate science, socio-economic research, and policy engagement, enabling a more holistic approach to addressing food system vulnerabilities.
- **Improving the integration of adaptation and mitigation strategies** by ensuring that mitigation considerations are systematically incorporated into adaptation research frameworks, facilitating comprehensive solutions to climate-related challenges.
- **Strengthening the use of GHG metrics and foresight modeling** within CGIAR's digital tools to improve the assessment of mitigation strategies and ensure their applicability in decision-making processes.
- **Expanding stakeholder engagement mechanisms** by fostering deeper collaboration with national and regional partners, aligning research objectives with real-world climate resilience needs, and improving participatory approaches in the design and implementation of initiatives.
- **Securing stable, long-term funding commitments** for CGIAR's climate research to ensure continuity, support high-quality innovation, and maintain leadership in global climate resilience efforts.

Each SG evaluation issued a management response (MR): ST SG Management Response; RAFS SG Management Response; and GI SG Management Response and their implementation is in the CGIAR's MR Tracker. Implementing recommendations would enhance the impact, efficiency, and coherence of CGIAR's climate research portfolio, strengthening its contribution to global efforts in building climate-resilient and low-emission food systems.

TO LEARN MORE, VISIT THE CGIAR SCIENCE GROUP EVALUATIONS PORTAL

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