



Independent
Advisory and
Evaluation
Service



Genetic Innovation Science Group: Evaluation Report 2024

*Rodrigo Paz Ybarnegaray, Bettina I.G. Haussmann, David H. Meyer,
Glenn James Bryan, Supreme Edwin Asare
IAES: Ibtissem Jouini*

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Table of Acronyms

ARI	Advanced Research Institution
BT	Breeding for Tomorrow
CRP	CGIAR Research Program
CSIR	Council for Scientific and Industrial Research, Ghana
DE	Development Evaluation
DOI	Digital Object Identifier
EA	Evaluability Assessment
EiB	Excellence in Breeding
FAIR	Findable, Accessible, Interoperable, Reproducible
GI	Genetic Innovation
GISG	Genetic Innovation Science Group
GloMIP	Global Market Intelligence Platform
IAES	Independent Advisory and Evaluation Service
IR	Inception Report
ISDC	Independent Science for Development Council
IMIC	International Maize Improvement Consortium
MER	Monitoring, Evaluation, and Research
MEL	Monitoring, Evaluation, and Learning
MYEP	Multi-Year Evaluation Plan
MR	Management Response
MS	Market Segments
NARES	National Agricultural Research and Extension Systems
PMEL	Planning, Monitoring, Evaluation, and Learning
PMP	Program Management Platform
PP4I	Private Partnerships for Impact
QoR4D	Quality of Research for Development
QoS	Quality of Science
RAFS	Resilient Agrifood Systems
RII	Regional Integrated Initiatives
RTE	Real-Time Evaluation

SARI	Savanna Agricultural Research Institute
SDG	Sustainable Development Goal
SG	Science Group
SP	Science Program
SIMEC	Strategic Impact, Monitoring and Evaluation Committee
SME	Subject Matter Experts
ST	Systems Transformation
ToC	Theory of Change
ToR	Terms of Reference
TPP	Target Product Profile
TRICOT	Triadic Comparison of Technologies
UFE	Utilization-Focused Evaluation
WP	Work Packages
W1/W3	Window-1 /Window-3

Executive Summary

The [CGIAR 2030 Research and Innovation Strategy](#) sets the stage for research that provides solutions for development. Priorities set out in the strategy were delivered through 33 initiatives grouped within three interlinked Action Areas: [Systems Transformation \(ST\)](#), [Resilient Agri-food Systems \(RAFS\)](#), and [Genetic Innovation Science Group \(GISG\)](#).

This independent engagement evaluates the GI Science Group (GISG), therefore GISG is considered the evaluand. The evaluation scope covers the GISG portfolio implementation from January 2022 to February 2024, excluding the Genebank Platform, which was evaluated in 2023 (see the [report](#)). The evaluation criteria include relevance, coherence, effectiveness, efficiency, and quality of science (see [ToR](#)). The evaluation findings and recommendations should inform strategic decision-making, portfolio design, and the development of new GI and science program proposals. Additionally, the evaluation contributes to decision-making by the CGIAR System Council about the 2025–27 Multi-Year Evaluation Plan inform strategic decision-making, portfolio design, and the development of new GI and science program proposals. Additionally, the evaluation contributes to decision-making by the CGIAR System Council about the 2025–27 Multi-Year Evaluation Plan.

Evaluation Purpose, Scope and Methodology

The evaluation of the GISG work used mixed methods and a theory-based approach (see [ToR](#)). The evaluation team used both quantitative and qualitative data from primary and secondary sources. Aligned to the TORs and Quality of science ([QoS evaluation guidelines](#)), primary data collection was conducted: 68+ stakeholders, which included semi-structured interviews and focus group discussions (FGDs); and an [online survey](#) with total of 450 internal and external respondents, including 53 internal stakeholders associated with GISG. Secondary data collection included reviewing documents and reports. Key considerations included [CGIAR evaluation guidelines](#), 2021 [ISDC](#) reviews, evidence from the 2023 Genebank [Platform Evaluation](#) report and three case studies (CS): CS 1 on feedback loops among GI initiatives; CS 2 about synergies in CGIAR breeding programs, centers, and targeted markets; and CS 3 about the status of partnerships with NARES and the private sector. These CSs complement each other to provide a comprehensive understanding of change and the contribution of GISG at crop breeding and food systems levels. Evaluation results were shared on several occasions throughout the GISG evaluation to respond to emerging demands from different groups of internal users, to inform strategic decision-making processes unfolding in parallel with the evaluation exercise. in parallel with the evaluation exercise.

Evaluation Findings

Relevance: There is clear evidence that GISG has engaged with key internal and external stakeholders at various levels to ensure that the breeding goals and priorities of CGIAR are aligned with national and regional needs and priorities, critically including those of farmers and end-users. Better integration with RAFS and other SGs could have strengthened the relevance of the GISG work, as well as improved prediction and orientation capacity (Market Intelligence initiative), enhanced feedback loops within and between GISG initiatives, formalized national and regional breeding networks, better communication with donors and alignment with SDGs, etc. GISG's strategies, rooted in CGIAR's prior interventions, were well outlined through a Theory of Change (ToC), however, critical assumptions and operative mechanisms regarding contribution to early outcomes weren't sufficiently clarified, hampering a common understanding of different yet integrated outcomes to impact pathways.

Effectiveness: GISG has made significant progress in improving breeding program effectiveness by building on the results of the Excellence in Breeding (EiB)¹ platform and applying best practices. Mapping Target Product Profiles (TPPs) to breeding programs has provided clear direction, and capacity-building efforts have become more strategic based on recent peer and self-assessments of breeding programs, including NARES. Notably, since 2023, effective changes in testing strategies of breeding programs were reported by the surveys (82%), as well as effective improvements in breeding pipelines (87% of the surveys). However, GISG faced challenges in balancing its focus, as breeding programs are stretched across multiple TPPs, diluting efforts. Excessive reporting demands from funders and bilateral projects, along with unclear integration with other Science Groups (SGs) like RAFS, have further reduced effectiveness. Insufficient integration initiatives between genebanks and breeders also reduced the effectiveness of the GISG work, as well as the lack of a comprehensive variety lifecycle strategy.

Efficiency: There are evident improvements in crop breeding efficiency within CGIAR and NARES programs, driven by stronger collaboration and improved financial planning. However, the GISG efficiency has been negatively impacted by several challenges. These include budget discrepancies, unexpected funding cuts, and inefficiencies caused by managing multiple CGIAR contact points, which led to confusion and delays. Stakeholders also raised concerns about being overextended and called for clearer prioritization of breeding programs and target traits. The general efficiency of the GISG work could have been enhanced by sharing resources, reducing redundancies, learning from each other, fostering synergies and presenting a unified intervention strategy at breeding programs and food systems level.

Coherence: The GISG activities are highly coherent, given the consistent approaches in plant breeding across crops. Feedback from Market Intelligence is effectively utilized to provide the product development team with relevant and useful breeding resources. The roles of individual initiatives were clearly defined, specifying their interventions at various levels and stages of the crop-breeding process and detailing their specific contributions through relevant scientific outputs. Additionally, the relationships between the work of the initiatives and the wider GI work in CGIAR (bilateral, W3 and science project funding) were well elaborated for the largest grants. Although the initiatives are coherent, the details of their operations, mechanisms, effects on the crop-breeding process, synergies, and overall impact are not entirely understood and owned by all stakeholders. There is a need of a more explicit systems-oriented approach in breeding and better integration with RAFS and other SGs. There is plenty of room for improvement in aligning with the market needs and preferences of national partners.

Quality of Science (QoS): GISG's research is widely recognized by both internal and external stakeholders as being of high scientific quality. The QoS analysis conducted by the evaluation team further supports this finding, showing an impressive number of science outputs produced by the GISG, as well as website visits and downloads of a sample of key science outputs purposefully selected by initiative leaders to be used as part of the QoS analysis. The deliberate inclusion of diverse stakeholders and the focus on gender and social inclusion in research activities have enhanced the credibility and acceptance of the process and outputs. Moreover, the integration of GloMIP and the Breeding Portal demonstrates CGIAR's adherence to FAIR data principles, open science, and equitable partnerships. However, recurring changes, uncertainties, and emergencies have impacted the availability of specialized resources, affecting the consistency of output quality.

Cross-cutting Themes

Partnerships: The evaluation finds that GISG has been effective in fostering collaborations with NARES, Advanced Research Institutions (ARIs), and private sector partners (several achievements in this particular area were reported and registered). Notable examples, such as partnerships with Intertec and the

¹ Evaluated in 2022: <https://iaes.cgiar.org/evaluation/publications/evaluation-cgiar-excellence-breeding-platform-eib>

International Maize Improvement Consortium (IMIC), highlight GISG's ability to leverage these collaborations for innovation. However, some NARES partners have expressed uncertainty about their roles and alignment with GISG initiatives, suggesting a need for clearer communication that could have helped better understand alignment with and contribution of GISG initiatives. With little familiarity with the [A CGIAR Engagement Framework for Partnerships & Advocacy \(2022\)](#) there was a missed opportunity at CGIAR corporate level to pull out the key lessons from each of the partnerships and put together a capacity-building strategy and corresponding plan to be cascaded through the SGs at different levels.

Gender and Social Inclusion: GISG has successfully integrated gender and social inclusion into its breeding activities, particularly through the Market Intelligence platform (GLOMIP): gender-related trait preferences into product profiles, ensuring that breeding programs are tailored to the specific needs of men, women, and youth. The development of the [Genetic Innovation Gender Strategy](#), which provides a five-year roadmap (2024-2028), further illustrates this progress, as it guides the implementation of gender-intentional breeding across CGIAR's priority crops and market segments (this is a major achievement of the GISG in terms of gender and social inclusion across the board). In addition, the involvement of social scientists and the use of over 200 indicators offered by GLOMIP have strengthened stakeholders' ability to prioritize key impact areas, such as gender equality, climate resilience, and health outcomes. have strengthened stakeholders' ability to prioritize key impact areas, such as gender equality, climate resilience, and health outcomes.

Recommendations

The evaluation team presented the following set of actionable recommendations, with clear targeting of users, and with specific characteristics described in sub-recommendations:

1. GISG: Develop a transitional plan for GISG (the next six months and roll-out starting in 2025)

- a. **Acknowledge and build upon past accomplishments:** Document and leverage foundational achievements while addressing challenges from the past two years to inform the Breeding for Tomorrow (BT) Program design and implementation.
- b. **Minimize unnecessary changes:** Maintain consistency in effective processes, leadership, teams, and partnerships to foster ongoing success.
- c. **Enhance breeding programs and partnerships:** Strengthen CGIAR and NARES breeding programs, their interactions, and public-private partnerships.
- d. **Include key voices in planning:** Ensure the participation of individuals with deep understanding in the development of the next design phase.

2. CGIAR and BT science program writing team/management: enhance partnership effectiveness and communication

- a. **Leverage breeding networks:** Clarify roles and responsibilities of CGIAR, NARES, and partners in product design, development, delivery, and dissemination; increase NARES's responsibility and autonomy and incorporate Advanced Research Institutions (ARIs), as appropriate.
- b. **Conduct specialized training:** Offer short, impactful training-of-trainers modules for scientists on partnership identification, creation, and management.
- c. **Re-balance resources:** Ensure appropriate balance between product development, product dissemination and lifecycle management.

- d. **Promote participatory budgeting:** Ensure inclusive and transparent budget allocation processes to boost ownership and motivation.

3. BT science program writing team/management: cultivate leadership with a seed business mindset

- a. **Develop an effective leadership team:** Balance scientific expertise with seed business, operational excellence, and change management skills; differentiate technical and leadership roles, dedicating equal effort to both.
- b. **Adopt private sector principles:** Integrate successful private company principles into BT practices to deliver better varieties to farmers more efficiently.
- c. **Provide leadership training:** Offer training at all management levels to build teams based on empathy, trust, and communication; use proven private sector training modules for soft skill development.
- d. **Align with funders:** Maintain close dialogue with funders to align the seed business mindset with CGIAR center finances while upholding CGIAR values.

4. BT science program writing team/management: partner for strategic roll-out and operational excellence

- a. **Clarify roles and responsibilities:** Address the current variability in understanding the GISG strategy and individual roles; emphasize effective roll-out, operational excellence, and change management in the new BT science program.
- b. **Balance technical and organizational focus:** Evenly allocate resources between technical solutions and continuous operational improvement.
- c. **Design and implement training programs:** Design and implement training to foster desired behaviors and celebrate examples of success at all organizational levels.

5. CGIAR: Enhance GI's role in sustainable agri-food systems

- a. **Promote a common understanding:** Ensure GI's contribution to productivity, nutrition, environmental sustainability, and that inclusion is widely understood.
- b. **Drive market intelligence:** Anticipate future genetic innovation needs in response to systemic and other relevant changes.
- c. **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.
- d. **Strengthen geographic integration:** Form transdisciplinary teams to optimize region-specific production and food systems, maintaining methodologies and standards across regions.

6. BT science program writing team/management: insist on a system-wide optimization mindset

- a. **Focus on system optimization:** Shift the focus from optimizing individual roles and processes to enhancing the entire system.
- b. **Document role impacts:** Recognize and celebrate how each role contributes to overall project outcomes.
- c. **Facilitate coordination and collaboration:** Encourage collaboration at regional, national, and global levels with dedicated budget allocations.

7. CGIAR and BT science program writing team/management: rationalize resource allocation

- a. **Address budgeting issues:** Ensure financial stability to support long-term planning and continuity.
- b. **Align funding with goals:** Ensure all funding sources result in complementary goals and activities, providing financial stability and transparent budgeting.
- c. **Foster open dialogue:** Establish candid conversations between funders and BT leadership to prioritize activities and their funding effectively.
- d. **Clarify roles and reporting Structures:** Define roles for CGIAR and NARES staff working on BT projects and formalize reporting structures.
- e. **Ensure transparent budget allocations:** Use unbiased methods during budget allocations, considering contingency budgets to handle potential cuts.

8. CGIAR and BT science program writing team/management: embrace complexity in BT design and implementation

- a. **Utilize complexity tools:** Apply concepts designed for complex interventions in complex systems to guide the BT program.
- b. **Co-create a ToC:** Develop an overarching ToC with key stakeholders for shared understanding and ownership.
- c. **Develop a nested Program representation:** Detail pathways for change, contributions, interactions, feedback loops, and assumptions within the BT program.
- d. **Build a complexity-aware PMEL System:** Create a system to fulfil accountability and learning needs, allowing for swift adaptations.

9. CGIAR and BT science program writing team/management: transition to a new era of transformative change in GI

- a. **Reflect on past efforts:** Build mechanisms to ensure critical reflection on the past CGIAR research program (CRP)/SG efforts to inform future strategies and approaches in the BT program.
- b. **Implement periodical learning cycles:** Use critical reflection cycles to manage transitions towards transformative change within the BT program.

1 Background and Evaluation Context

1.1 Introduction

This Evaluation Report was prepared for the independent external evaluation of the [Genetic Innovation Science Group \(GISG\)](#), which was carried out under the framework of the CGIAR Science Group (SG) evaluations ([ToR](#))².

The evaluation of the GISG was commissioned by the [CGIAR System Council](#) and executed by the CGIAR Independent Advisory and Evaluation Service ([IAES](#)), with the support of external evaluation consultants and Subject Matter Experts (SMEs) (Annex 10). The GISG evaluation was based on the [IAES 2022–24 Evaluation Plan](#). Aligned to the [CGIAR Evaluation Framework and Policy](#), the purpose of the independent external evaluation of the GISG was to promote learning and lessons and support evidence-based efforts by CGIAR to adapt the 2025–30 portfolio design to reach the ambition and vision of the [2030 Research and Innovation Strategy](#). Key objectives of the GISG-level evaluation are:

- Provide real-time feedback and recommendations to contribute to CGIAR's institutional learning by those implementing and revising the CGIAR Portfolio.
- Facilitate initial accountability for, and learning from, the first two years of implementing the CGIAR Portfolio pertaining to the efficiency and effectiveness of the portfolio.
- Assist IAES and SIMEC to identify evaluative needs for the 2025–27 multi-year evaluation plan (MYEP).

1.2 Evaluation Scope, Purpose and Use

The [IAES](#) within CGIAR is implementing a comprehensive multi-year evaluation plan spanning from 2022–24. This plan outlines a strategic approach for evaluating the SGs using a cluster-based methodology as the starting point. As per the [IAES plan](#), there is a planned independent external evaluation for the GISG. Therefore, the GISG is the evaluand of this evaluation.

Scope: The GISG evaluation focused on learning from the implementation of the GISG Portfolio from January 2022 to February 2024. Even though this evaluation did not cover the GISG [Genebanks Initiative](#), given that it was individually evaluated in 2023 (see [report](#)), it did use relevant results to support general findings and recommendations. Similarly, the evaluation did not cover the five Impact Area Platforms; instead, it examined how they interacted with the GISG.

Use: Preliminary findings and recommendations of the GISG evaluation were generated and shared with immediate users on various occasions throughout the evaluation to inform strategic decision-making processes, particularly to inform the design of the subsequent portfolio scheduled from November 2023 to May 2024, and help enhance its coherence and efficiency. Furthermore, findings and recommendations are expected to assist in the development and refinement of new GI and other science program proposals. Additionally, the GISG evaluation aims to furnish evidence for decision-making by the CGIAR System Council during their meeting in December 2024. Finally, the evaluation is aimed at steering the identification of parameters for the 2025–27 MYEP.

² Two other two SG: [Systems Transformation \(ST\)](#) and [Resilient Agrifood Systems \(RAFS\)](#).

Figure 1: SGs (Action Areas) and five Impact Areas (Research Themes)

Source: [CGIAR 2022–24 Investment Prospectus](#)

1.3 Evaluation Criteria and Key Questions

Guided by CGIAR's Evaluation Policy, the evaluation was framed by targeted evaluation criteria with key evaluation questions as shown in Table 1. The lines of inquiry included:

- Comparative advantage and added value.
- Compliance with relevant CGIAR frameworks and policies, such as the [2022 Engagement Framework for Partnerships and Advocacy](#) and recommendations from the [High-Level Advisory Panel Report on Partnership](#).
- Integration of cross-cutting themes, such as gender and climate change.
- Linkages to [the five Impact Areas and platforms](#).

In line with the evaluation objectives aimed at promoting learning, decision-making, and accountability for various user and stakeholder groups, the evaluation of the GISG systematically collected, analyzed, and presented relevant information according to the [Terms of Reference \(ToR\)](#).

Table 1: Evaluation Criteria and Key Questions (TORs)

CGIAR Evaluation Criteria	Key Evaluation Questions
(1) Relevance	1) To what extent does the GISG research Portfolio respond to the needs and priorities of its internal and external stakeholders? 2) How well have the GISG strategies and objectives been articulated in terms of a ToC and impact pathways and drawing on comparative advantage across the system?

CGIAR Evaluation Criteria	Key Evaluation Questions
(2) Effectiveness	3) To what extent has the GISG initiatives/WP achieved and/or is expected to achieve, its objectives, including any differential results across subgroups of users/clients? 4) How well were the cross-cutting themes of gender and climate change integrated into design and implementation (tagging)? 5) To what extent does the GISG draw on the capacities of the Impact Area platforms and vice versa? 6) To what extent did the GISG design enhance partnerships reach (internal and external) of CGIAR, and how aligned it was to the Partnership Framework (2022) ?
(3) Efficiency	7) To what extent is the governance and management of the GISG deemed suitable for achieving the objectives? 8) How has the CGIAR Integration Framework Agreement (2022) design and roll-out aided GISGs to effectively stimulate the learning, monitoring, and adaptability of the SG Portfolio, through Initiatives? 9) What are the internal and external factors influencing GISG efficiency within a system of fully independent centers, considering the constraints of limited resources?
(4) Coherence	10) How coherent and compatible has been the design and implementation of the GISG Portfolio with Partnership Framework towards CGIAR's 2030 Research Strategy? 11) How has the GISG operationalized CGIAR's collective vision in the 2030 Research Strategy and CGIAR's Integration Framework Agreement ? 12) In what ways has the GISG addressed key considerations and opportunities for enhancing coherence across, between, and within each SG?
(5) Quality of Science (QoS)	13) To what extent does the GISG ensure the Quality of Science (scientific credibility and legitimacy)?

2 Overview of CGIAR's GISG

2.1 Context (Objectives, Research Areas, Expenditures, Results, and Management)

The CGIAR Research initiatives within the [CGIAR 2022–24 Investment Prospectus](#) were organized around three Action Areas: [Genetic Innovation](#) (GI), [Resilient Agrifood Systems](#) (RAFS) and [Systems Transformation](#) (ST). CGIAR scientists are organized into three SGs that correspond to these three Action Areas. While each initiative is managed by a specific SG, scientists working on these initiatives typically come from across the CGIAR system and partner organizations. The SGs were an attempt at a fundamental structural change in CGIAR, not just an arrangement to run a portfolio. The initial idea was that the SGs would, in the long run, replace the centers. The aim of this restructure was to make CGIAR fit for the purpose for complex 21st-century problems, rather than structured to address sub-sectoral problems separately via independent centers working on their own commodities or sub-sectors. This initial idea was later modified to a matrix model—that the SGs would provide functional leadership for all CGIAR's science, while the centers would provide institutional homes for the scientists.

The GI SG aims to improve food and nutritional security at global, national, and household levels by enhancing women's equality of access to genetic resources, ensuring crop improvements lead to meaningful increases in household incomes and poverty reduction, boosting environmental performance,

raising nutritional content and diversity, and breeding for future climates and climatic instability. The GISG explicitly addresses all five CGIAR Impact Areas and integrates environmental sustainability by developing crop varieties resilient to changing conditions and conserving genetic diversity through a global multi-partner Genebank system. Additionally, GISG focuses on place-based integration innovation, working closely with National Agricultural Research and Extension Systems (NARES) worldwide to deliver improved varieties of crops and forages to small-scale farmers in specific geographic areas. This holistic and place-based approach ensures that genetic gains are realized in farmers' fields, resulting in increased yield, biofortification, pest and disease resistance, resilience, and improved environmental tolerances, ultimately benefiting less resource-endowed producers and consumers across all five Impact Areas.

2.2 Genetic Innovation SG Theory of Change

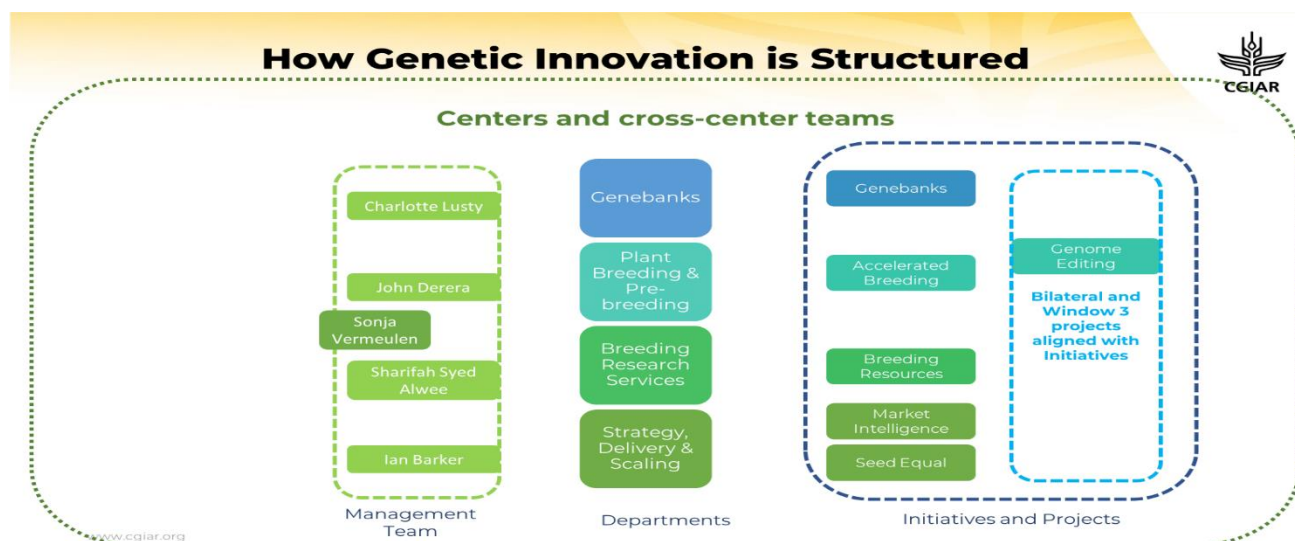
The CGIAR [GI Theory of Change \(ToC\)](#) (Figure 2) outlines a strategic framework aimed at significantly advancing crop improvement. This approach focuses on conserving and utilizing genetic resources, prioritizing breeding investments in high-impact market segments, and developing high-performing crop varieties. The GISG employs precision genetic technologies to accelerate the breeding process and provides tools, technology, and shared services to enhance the efficiency of breeding programs through six initiatives. Additionally, increasing investment in seed delivery is set to ensure farmers have access to improved varieties, boosting agricultural productivity, climate resilience and nutrition. By leveraging CGIAR's capabilities, as well as its innovation and scaling partners' capabilities, the GISG seeks to create innovative partnership models with NARES and the private sector. This collaboration focuses on research, breeding, and scaling up delivery of new varieties. Working in synergy with other SGs, the GISG intervention aims to create an enabling environment for testing and scaling innovations. The GISG contributes to the achievement of seven outcomes by working with demand and scaling partners, and through five Impact Areas to the achievement of Sustainable Development Goals ([SDGs](#)).

In 2023, the GISG developed a revised/working version of the ToC (Figure 3), to highlight entry points and interactions of different GISG initiatives along a generic breeding pipeline (product design, development and delivery). Furthermore, the ToC specifies spheres of control (breeding pipeline), influence (outcomes and impact) and interest ([SDGs](#)), the involvement of key internal and external stakeholders across the breeding pipeline, and connections and interactions with other SGs, e.g., ST and RAFS. Above all, the intent of this revised ToC diagram was to provide a framework for connecting CGIAR work to the GI area.

2.3 Management and Governance

In terms of management and governance, the GISG is headed by a managing director who reports to the executive managing director of the CGIAR. Reporting to the managing director are the four senior directors, who oversee various departments including Genebanks, Plant Breeding and Pre-breeding, Strategy, and Delivery and Scaling, as illustrated in Figure 4. Each Initiative ([Genebanks](#); [Accelerated Breeding](#); [Breeding Resources](#); [Market Intelligence](#), [Seed Equal](#)) is aligned to one department and further divided into Work Packages (WPs), each managed by a WP lead (not included in Figure 4). Thus, Initiative leads report directly to the respective senior directors, and Work WP leads report to their respective Initiative leads (and to their respective centers). Bilateral and Window 3 projects are also represented and aligned to one or more initiatives.

Figure 2: Managerial and Governance Structure of the GISG



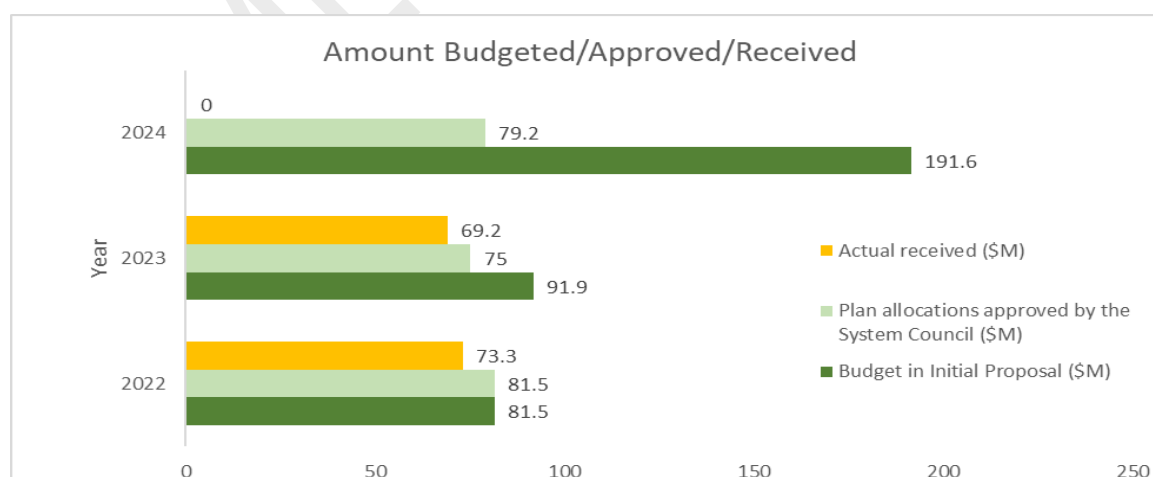
Source: CGIAR, 2022

2.4 GISG 2022–24 Budget

Budget data in Figure 5 are for 3 years (2022–24), indicating different stages of the budgeting process: the initial proposal, the approved annual financial plan, and the final budget received. In 2022, the proposed budget was USD 81.5 million, which received full approval from the System Council. However, only USD 73.3 million was received, resulting in a USD 8.2 million shortfall. In 2023, the proposed budget increased to USD 91.9 million, but the System Council approved only USD 75 million. The actual funds received amounted to USD 69.2 million, leading to a significant shortfall of USD 21.7 million compared to the initial proposal and USD 5.8 million compared to the approved amount. This demonstrates persistent difficulties in reconciling proposed budgets with approved and received funds.

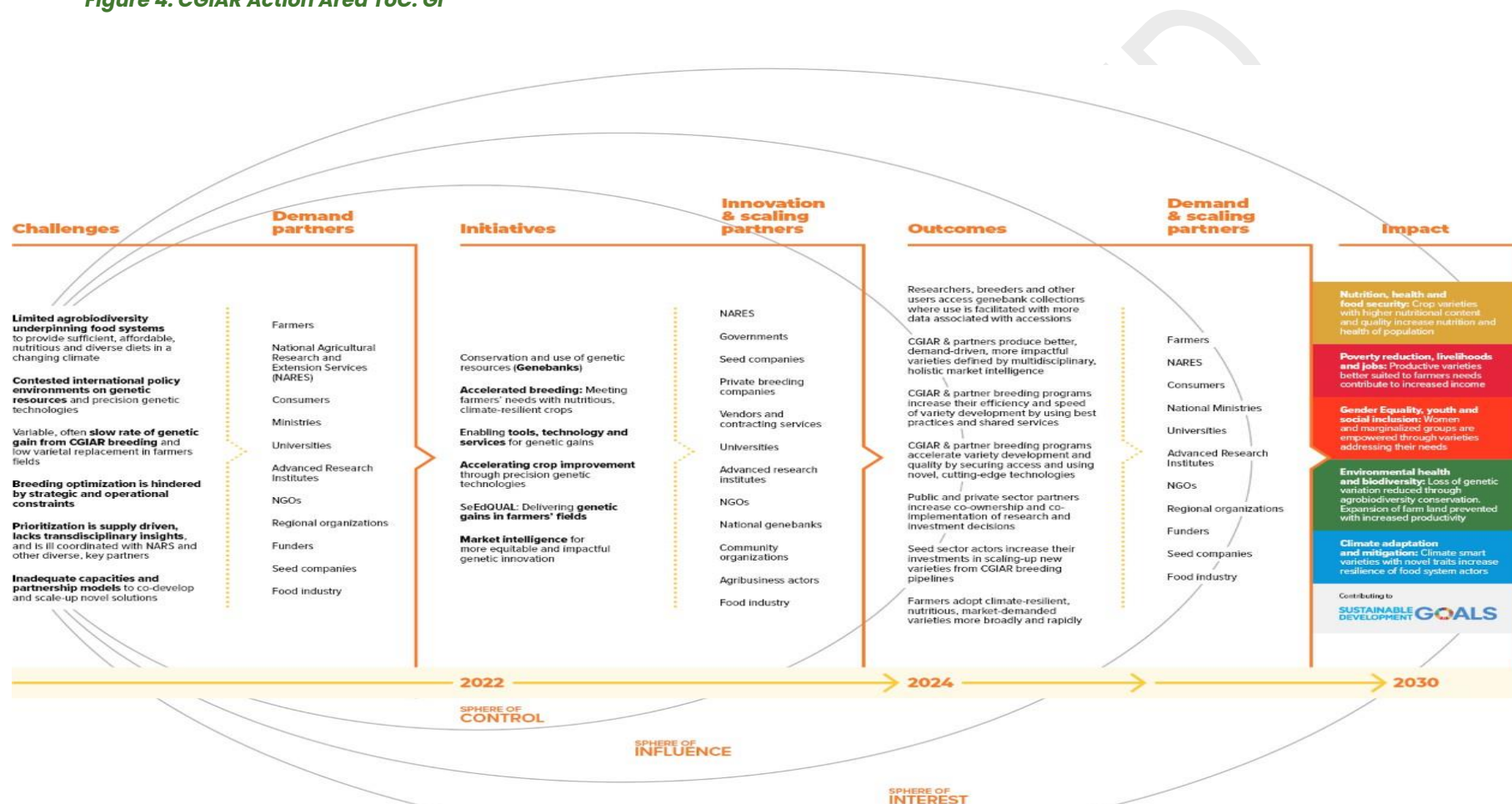
For 2024, the proposed budget rose significantly to USD 191.6 million. Despite this increase, the System Council approved only USD 79.2 million, with the actual amount received still pending. Over these three years, there was a growing disparity between the ambitious budget proposals and the more modest amounts approved, suggesting challenges in the budget planning and approval processes.

Figure 3: GISG 2022–24 Budgeted/Approved/Received Amount



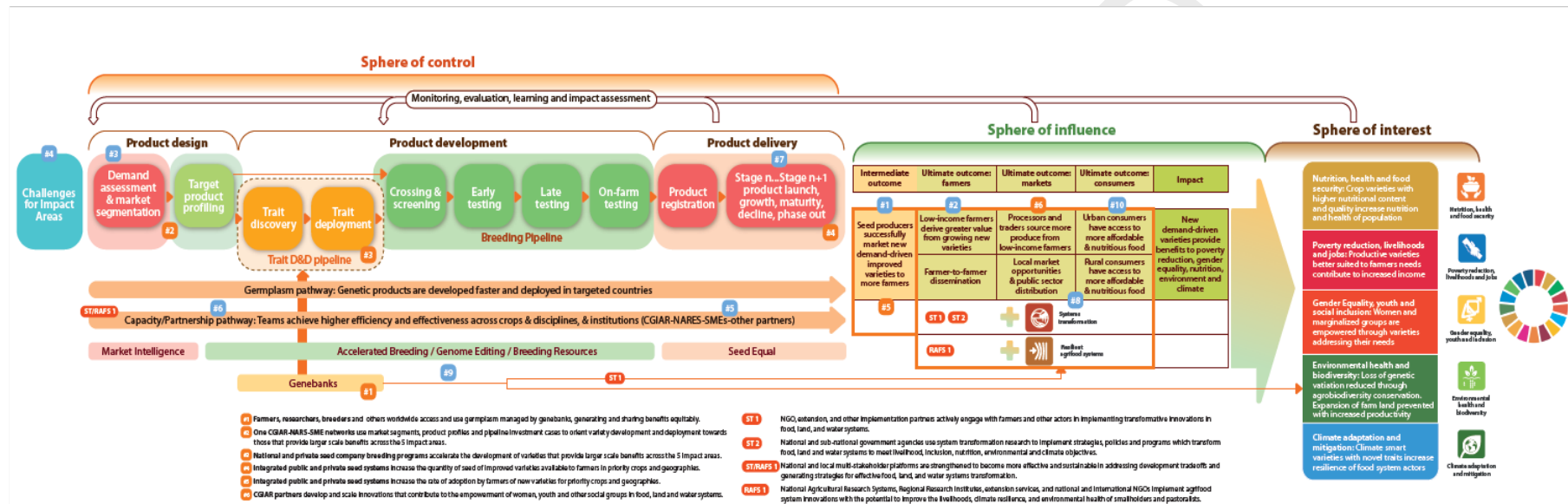
Source: 2022–24 CGIAR Portfolio and Designated Financing Plan

Figure 4: CGIAR Action Area ToC: GI



Source: CGIAR 2022–24 Investment Prospectus

Figure 5: GISG (revised) ToC

Source: *Genetic Innovation Portfolio Narrative, 2022*

3 Evaluation Approach and Methodology

3.1 Evaluation Approach

The [CGIAR Evaluation Framework and Policy](#) (2022) guided the general design and implementation of this process evaluation (endorsed [TORS](#)). The

SG evaluations merged [developmental evaluation \(DE\)](#), [utilization-focused evaluation \(UFE\)](#) approaches and elements of [real-time evaluation \(RTE\)](#), focused on monitoring and real-time learning. RTE was adopted to ensure that authors of CGIAR proposals for the [new 2025-30 research portfolio](#) and CGIAR [management](#), and ISDC reviewers. Namely the following steps were undertaken:

- ✓ Evaluation portal was set-up <https://iaes.cgiar.org/evaluation/science-groups-evaluations>
- ✓ Since March, monthly Evaluation Insights were shared with SG teams and key stakeholders, offering methodological insights and updates on early learnings and findings on key topics. The bulletins also kept stakeholders informed about the evaluation process and key events.
- ✓ Meetings with SIMEC and SC (June 3rd) were conducted, where strategic findings and recommendations were presented.
- ✓ Two presentations were made to ISDC members, during which lessons learned and findings were shared by subject matter experts. These presentations fostered interactive discussions, offering insights through specific case studies and deep dives. Furthermore, 3 reports with 11 case studies were shared with review teams commissioned by ISDC to conduct ex-ante
- ✓ Three meetings with management of each Science Group (Genetic Innovation, Resilient Agrifood Systems, and Systems Transformation) were held to launch evaluations, present preliminary results and validate recommendations prior to submitting of reports to SIMEC.
- ✓ Two meetings were held with the 2025-30 Portfolio writing teams, and permission obtained and exercised to share SG evaluations reports and case studies/deep dives by request.
- ✓ Regional/Country Briefs and thematic briefs and reports (i.e. QoS, and a report on the [survey results](#)) were developed and links widely shared. The briefs summarized the learnings across the three SG evaluations around the priority topics. The Synthesis of Cross SG-learning and additional briefs (on partnerships, climate change, and MELIA) were being developed at the time of endorsing the SG-level evaluation reports.
- ✓ Several blogs were made public and shared with key stakeholders, highlighting strategic observations from country visits, particularly from the perspective of external partners.

Furthermore, drawing on the [2021 Synthesis Evaluation](#) recommendations and other relevant evaluations (e.g. [platforms](#), including [Genebanks](#) (2023)), this evaluation assessed how the GISG initiatives during 2022-24 considered relevant areas holistically through trade-offs/synergy analyses. It also considered the potential benefits and drawbacks of various strategies and actions within thematic areas, and how they interact. Synergies arose from implementing two or more adaptation strategies concurrently with respect to increased productivity, resilience, yield stability, sustainability, and environmental protection. This holistic approach should help CGIAR to make strategic decisions about which markets to serve and which products to develop to address the thematic areas that are being focused on.

A key feature of the methodological approach has to do with the context-specific circumstances under which the GISG was designed and implemented and its strategic importance for CGIAR now. The picture and description below illustrate how the evaluation team understood the pivotal role of GISG work and its critical importance towards the materialization of the evolving One CGIAR concept.

Box 1. Symbolic representation of the general GISG Evaluation Approach



January is named after the Roman God '**Janus**'. Janus was the god of beginnings and doorways (to the future). Janus is generally depicted with two faces in opposite directions as he supposedly can see both the future and the past.

- The recent **past** being the foundational work of One CGIAR through CRPs, platforms, etc.

-The **present** being the transitional work of the GISG so far, through initiatives and WPs ('doorways to the future').

-The **future** being the consolidation work through the Breeding for Tomorrow (BT) science program.

Finally, the evaluation considered both direct and indirect contributions of GISG work to the improvement of crop breeding systems, processes, and programs, given that at ground level it is the work of CGIAR crop breeding programs that are more visible and accountable. A distinctive piece of the evaluation approach was understanding the added value of GISG work, making explicit the operative mechanisms by which initiatives and WPs contribute to the improvement of crop breeding systems, processes and programs, and through that to the development of more sustainable and inclusive food systems.

3.2 Methodological Approach

The evaluation team used a mixed methods approach (see [IoR](#)), combining quantitative and qualitative data and information from primary and secondary sources. Key considerations included adherence to CGIAR evaluation guidelines, incorporation of 2021 ISDC reviews and recommendations, evidence from the recent Genebank Platform Evaluation³, and three case studies: Case Study 1: Feedback loops among the GI initiatives; Case Study 2: Synergies in CGIAR breeding programs, centers and targeted markets. ; Case Study 3: Status of partnerships with NARES and private sector.

Primary data collection involved 68 interviews (individual and group interviews), observations, and a survey (Annex 6 and general SG results⁴). Secondary data collection included GISG document reviews and reports. A series of tailored analyses were conducted, including:

- **ToC analysis:** involved a detailed examination of the ToC to understand how it was developed, revised, updated and used (see Annex 1, Figures 1 and 2).

³ <https://iaes.cgiar.org/evaluation/publications/cgiar-genebank-platform-evaluation> .

⁴ <https://iaes.cgiar.org/evaluation/science-groups-evaluations>

- **Portfolio analysis:** included analyzing the portfolio of initiatives and WPs, focusing on leadership, objectives, budget, primary impact areas, targeted countries of operation, and the addressed SDGs, based on data and information availability (see Annex 9).
- **QoS analysis:** included the analysis of the general production of scientific outputs by initiative, and the analysis of the most relevant and influential scientific outputs by initiative.
- Additionally, the evaluation team considered **recommendations from the 2021 synthesis report and the associated management action plans, as well as the Genebank evaluation report.** The 2021 synthesis report identified specific gaps and management responses with action plans to address these gaps. As part of the evaluation, the team assessed the progress of action plans (see Annex 10).

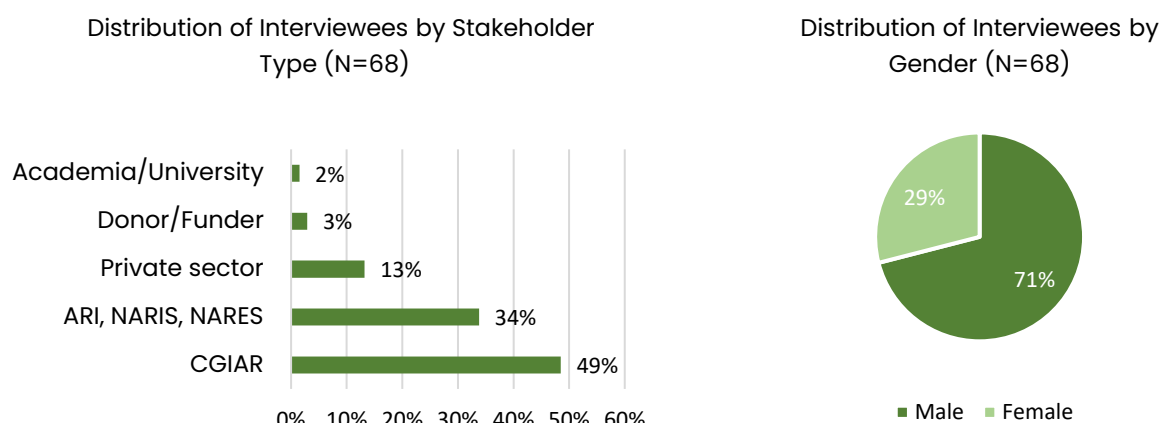
The three case studies were conceived and designed using a set of criteria (see Annex 1, Table 2) to respond both to specific (as intrinsic case studies) and general (as instrumental case studies) questions regarding the ways the GISG operated in line with its ToC. The case studies are not independent pieces of work, but ones conceived and designed to complement one another, and altogether contribute to tell a bigger story of change and contribution of GISG work (executive summaries can be found in Annex 2 and reports are available upon request).

3.3 Data Collection Methods and Tools

Primary data was collected through interviews and a survey. Furthermore, data collection included field visits to Ghana and Kenya, and specific online interviews with external stakeholders in Tanzania (NARES), as well as with several private sector informants at national, regional and global levels, and donors. The findings were triangulated with interviews and survey results, as well as with the results of other analysis (e.g. portfolio, quality of science, ToC).

Interviews: The GISG evaluation team conducted interviews with stakeholders using both online and face-to-face methods. Face-to-face interviews were conducted during country visits to Ghana and Kenya, employing a combination of focus group discussions and individual interviews. In total, 68 stakeholders affiliated with the GISG were interviewed, comprising 48 (71%) males and 20 (29%) females, and representing different types of stakeholders and geographic regions (Figure 6).

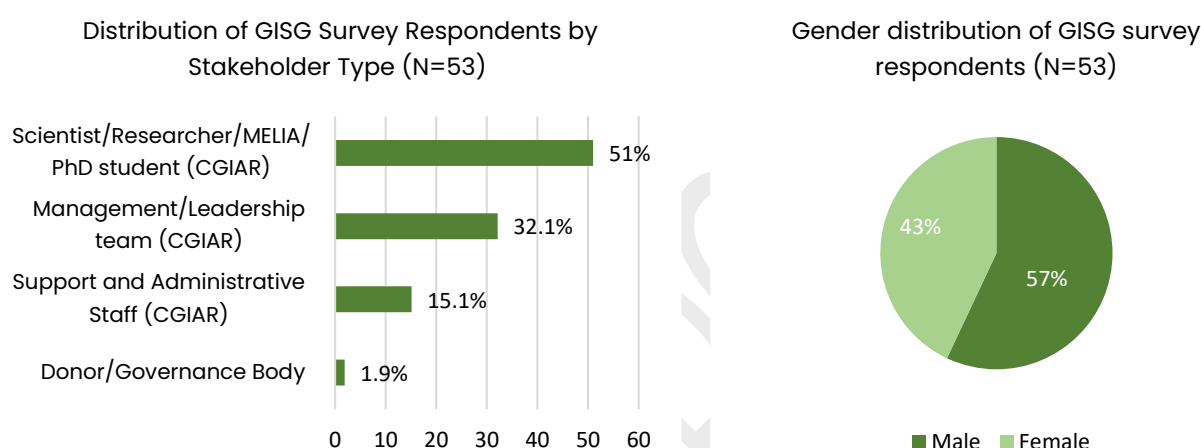
Figure 6: GISG Interviewees by stakeholder type and gender (N=68)



Source: IAES SG Evaluation Survey, 2024

Online Survey: The IAES conducted an online survey of the stakeholders of the three SGs (GI, RAFS and ST) to collect both quantitative and qualitative data on relevance, coherence, effectiveness, efficiency, QoS, and cross-cutting themes of gender, climate change and partnerships (see report [here](#)). The online survey was open from 26 April to 15 May 2024. While the survey was released in English, Spanish questionnaire was available upon request. A total of 437 responses were received across the three SGs, with 53 responses (30 males and 23 females) from internal stakeholders affiliated with the GISG. The geographical distribution of the 53 stakeholders spanned 23 countries across six continents (see Annex 6, Table 2). The findings from this survey were triangulated with data from interviews, document reviews, and other analytical approaches, as described in the subsequent section.

Figure 7: Online Survey – Profile of GISG respondents (N= 53)



Source: IAES SG Evaluation Survey, 2024

The survey results indicate a diverse group of CGIAR stakeholders, including management, scientists, funder, and administrative support (see Figure 7). Many respondents have a long-term involvement with CGIAR, with half having over a decade of experience, suggesting a stable and experienced group committed to CGIAR (from here onwards respondents from this group are called internal stakeholders).

4 Considerations and Limitations

Disclosure of information: Despite the evaluation team's assurances of strict privacy and confidentiality of interviews, some stakeholders, particularly CGIAR staff, fear disclosing information. This was mitigated largely by a continuous assurance of privacy and anonymity throughout the interview process.

Scheduling conflicts: Due to conflicting schedules, it was challenging to find suitable times for interviews between the evaluation team and stakeholders. This issue was mitigated by the evaluation team's flexibility in conducting some interviews early in the morning and others late in the evening.

Responsiveness of points of contact: The evaluation team faced delays from country points of contact, necessitating changes in-country visits. Consequently, the evaluation team visited Ghana and Kenya, and had to cancel the visit to Tanzania. Specific online interviews with key internal and external stakeholders were conducted in Tanzania to gather data and information for the three case studies.

To mitigate for the above and as part of the standard QA, across three SG evaluation teams, IAES conducted a layered quality assurance system, which involved: 1) an internal peer review within the evaluation teams; 2) a second-level review by IAES; and 3) an external peer review mechanism(s) and the evaluation reference group of IAES.

5 Key Evaluation Findings by Evaluation Criteria/Questions

This section presents the key evaluation findings based on the criteria/questions listed in Table 1. Sources of data and information were used to support the findings as presented here onwards.

5.1 Relevance

There is clear evidence that GISG has engaged with key internal and external stakeholders at various levels to ensure that the breeding goals and priorities of CGIAR are aligned with national and regional needs and priorities. These priorities include increase in productivity, resistance to biotic and abiotic stresses and climate change adaptation, gender-related considerations, grain quality traits, and better nutrition, thereby fostering genetic gains in farmers' fields. By design, representatives of farmers and end-users participate in the Market Intelligence Initiative. They contribute especially to the identification of market segments (MS) and target product profile (TPP) design. More explicit feedback loops between product delivery (Seed Equal) and product design and development activities have the potential to further increase the relevance of GISG work. In addition, a more production/food-systems-oriented breeding approach, and better integration with RAFS, especially with agronomy and plant health research, could further strengthen the relevance of GISG activities.

Such integration with RAFS could go hand-in-hand with a geographic integration effort in each country/region or agroecology. Transdisciplinary teams consisting of breeders, agronomists, plant pathologists, economists, nutritionists, social scientists, farmers, and end-user representatives would cooperate to address region-specific needs, optimize production/food systems, and collaborate with local partners and policymakers, to enhance climate change adaptation, environmental health, and nutrition. While enhancing the geographic integration and regional implementation focus, consistent methodologies and standards should be maintained across regions.

There is a significant opportunity for Market Intelligence to put more energy/resources into predicting future needs. Most breeding takes a long time, and that means that Market Intelligence must be predicting market needs seven to fifteen years out and TPP is designed from that information. The real value of Market Intelligence is in looking forward, not just refining current data.

Major donors are influential players when it comes to priority-setting at different levels (CGIAR crop breeding programs, as well as at national, regional and global levels). However, GISG aims at a prioritization that reflects the triangulation of regional/national, scientific (i.e., evidence based), and funder priorities. In doing so, GISG work already influenced, and can further influence, donors in the future, for them to more effectively respond to national, regional and global needs and priorities based on evidence (e.g. based on high-quality data and information on potential outcomes and impacts generated by the Market Intelligence Initiative). This is crucial to strengthen partnerships and to meet the SDG agenda.

For instance, a donor remarked, "One recent development we are excited about is the formalization of breeding networks. These networks involve shared responsibilities and decision-making among CGIAR and NARES partners. They concentrate on shared market segments and product profiles, significantly integrating NARES into CGIAR's work".

During the online key informant interviews (key internal and external stakeholders), as well as during the field trip in Ghana, participating NARES partners confirmed that interaction with CGIAR was intensified compared to pre-2022, with an increased number of meetings, trainings, international workshops, and joint research activities. NARES scientists felt they were being listened to by CGIAR partners. Savannah Agricultural Research Institute ([SARI](#)) reported more ownership for joint activities with CGIAR because people's opinions and needs were more considered (co-creation). For example, in Ghana, the One CGIAR has become more responsive to the needs of NARES and priorities during the last two to three years. To further enhance relevance, some NARES wish to be more closely integrated into the leadership teams and decision-making processes of the GISG.

Furthermore, online interview results revealed that respondents have a strong positive perception of the applicability of CGIAR's research, as one NARES stakeholder remarked: "The practical applications of CGIAR's findings are evident, making it highly relevant for implementation by end-users".

In Ghana, GISG supports the Council for Scientific and Industrial Research ([CSIR](#)) rice breeding program to achieve Ghanaian National Research and Development priorities, namely, to reach self-sufficiency in rice and reduce rice imports from Vietnam and Thailand. Such alignment with national priorities reflects the important level of relevance of the GISG and its partner NARES in Ghana.

The strategies and objectives of the GISG were well articulated in terms of an overarching/high-level ToC that was built upon the work of previous CGIAR interventions at system level (e.g. Excellence in Breeding (EiB) platform⁵). A ToC analysis conducted by the evaluation team revealed that critical causal assumptions about the contribution of initiatives and key 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, even with the development of a revised and more detailed version of the GISG ToC (See Figures 2 and 3). One example of critical causal assumptions about change and the contribution of GISG work not made explicit has to do with the importance of synergies and feedback loops between GISG initiatives, between GISG initiatives and crop breeding programs, and between GISG initiatives and crop breeding programs with the private sector, something intentionally explored by the three case studies that are part of this evaluation. Another example relates to assumptions regarding successful collaboration, as stated by one key informant: there is evidence in GI that scientists and technicians across the centers do want to work together. However, the organizational structure of independent centers with very different administrative rules, coupled with certain incentives among top management of those centers, militates against the kind of cooperation and enabling environment that scientists and technicians seek. While common goals and a desire to work together are essential for successful collaboration, so too is attention to resolving the administrative and managerial barriers to this collaboration.

The design and production of key research outputs, in terms of their expected contributions to early outcomes along impact pathways, could have provided better insight and communication on how all CGIAR workstreams—whether CGIAR initiatives or bilaterally funded projects—individually and collectively contribute to transformation at crop breeding systems level. Periodical and critical assessments of critical

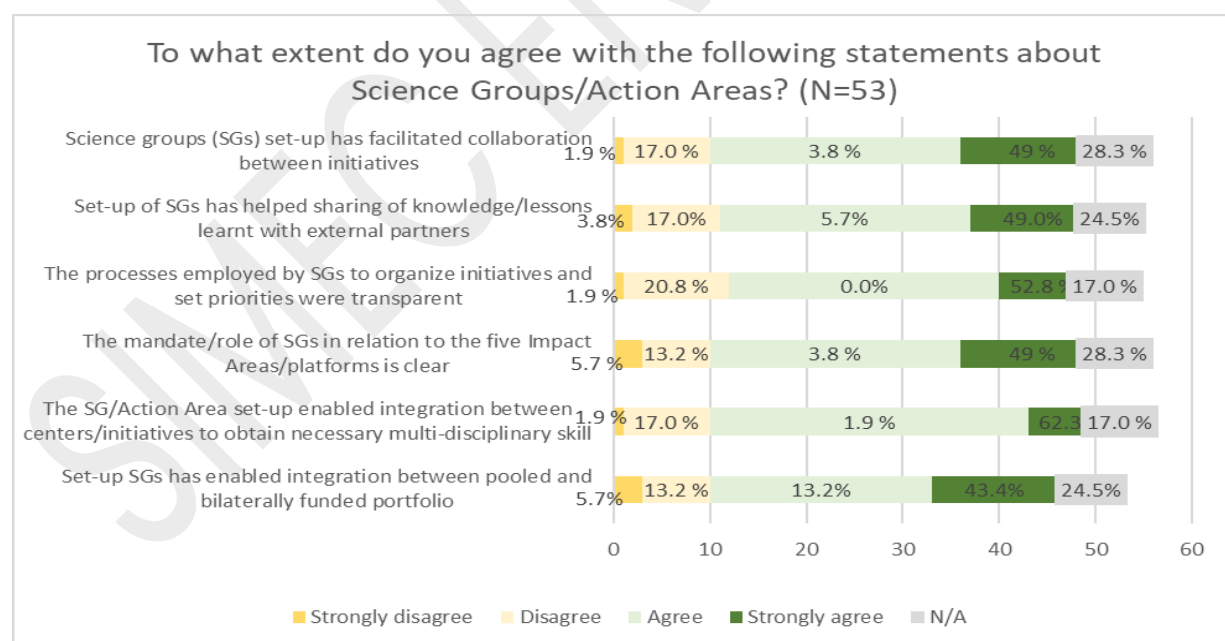
⁵ <https://iaes.cgiar.org/evaluation/publications/evaluation-cgiar-excellence-breeding-platform-eib>.

causal assumptions and progress along impact pathways would have helped reach a common understanding about change and contribution. This also would show the added value and comparative advantage of GISG work from the outset and throughout the implementation process, enhancing its relevance among internal and external stakeholders. Moreover, it could have helped coordination efforts within and between GISG initiatives. Although it can be argued that a two-year timeline was too short for multiple assessments against the ToC, and that a critical review of the ToC was indeed planned for 2024 (initiative later on dismissed by the new leadership), it is clear that at least one learning cycle involving key internal and external stakeholders could have helped enhance ownership of the ToC and create swift innovation processes.

The GISG largely operated in line with its overarching ToC (both original and updated versions). The high-level rationale of the GISG remains current and relevant, however, there have been interesting changes along the way, revealing that there was room for even more purposeful and intentional learning and adaptation. The rationale behind the Market Intelligence Initiative is a good example of change given its evolution from a more instrumental focus on equity and impact to a more transformational focus on informing, prioritizing, and steering genetic innovation efforts at national, regional and global levels. The fact that it is now placed at the beginning of the pipeline depiction of GISG work instead of the end (see Figures 2 and 3) clearly shows an explicit recognition of its relative importance and relevance. It also suggests recognition of an interactive cycle rather than a simple pipeline.

Revisions of the original ToC conducted in 2023 (Figure 3) more clearly illustrate envisaged feedback loops among the initiatives, but still as a linear process (a pipeline with only three intervention and interaction points between initiatives), instead of a comprehensive one with several intervention and interaction points at different levels of crop breeding systems and processes (see case studies in Annex 2).

Figure 8: Internal stakeholders' opinion on relevance of the GISG



Source: IAES SG Evaluation Survey, 2024

Case study 1 of this evaluation revealed that in practice, synergies, co-creation, and feedback loops are strong among Market Intelligence and Accelerated Breeding/Breeding Resources initiatives. After the Market Survey (which consults all types of stakeholders including farmers and end users), economists and breeders

work together to design the choice trials where producers and other stakeholders choose trait combinations of interest. These choice trials feed into the product profile design. The integration of the Global Market Intelligence Platform ([GloMIP](#)) and the Breeding Portal marks a significant achievement in CGIAR GI toward more effective digital tools for breeding pipelines, promoting collaboration and transparency. By implementing a cohesive data management approach, these platforms drive CGIAR genetic innovations to new heights.

Feedback loops from Seed Equal back to Market Intelligence were not yet visibly in place (more depending on personal relationships and interactions than on specific and formally established mechanisms), but such a feedback system is presently being worked on. In doing so, it will be important to also integrate data and learnings from partner private sector seed companies, as they might have profound insights and data regarding production and adoption constraints, and regarding the robustness/resilience of the newly introduced crop varieties. Taking these into account can in turn enhance the producibility and scalability of future new varieties.

5.2 Effectiveness

To what extent have the GISG initiatives selected/WPs achieved and/or are expected to achieve, the objectives, including any differential results across subgroups of users/clients?

By building on the results of the EiB platform⁶, GISG illustrated significant progress in achieving results through the application of best practices. The mapping of TPP to breeding programs provided clear direction to breeding pipelines. Based on recent peer and self-assessments of partners' levels of breeding activity, strengths, opportunities, and ambitions, it has become clearer which program, including NARES, needs capacity building. This allows for strategic assistance. Additionally, ensuring selection mimics the end use of the variety, 82% of breeding programs reported changes to their testing strategies in 2023 based on quantitative genetics and biometrics principles. There has been an increasing use of Triadic Comparison of Technologies ([TRICOT](#)), large numbers of farmers test candidate varieties on their own farms and provide feedback. Furthermore, measuring genetic gain in a standardized way has shown positive results. Realized genetic gain for yield was reported for 13 crops across centres, and was positive for 87% of pipelines, with 122 out of 140 pipelines showing improvement. GISG is encouraged to continue to monitor the evolution of realized genetic gains in its breeding pipelines, so that longer-term comparisons of the GISG impact on breeding efficiency can be made.

Looking at successful activities and delivered research outputs, there is clear evidence that GISG initiatives and WPs made progress towards conducting activities and delivering research outputs as planned and expected (Annual reports 2022 and 2023, and Portfolio Analysis–Annex 9). Moreover, there are clear indications that the usefulness and potential of key research outputs are recognized by internal and external users/clients, particularly in terms of precision (markets and products), improving crop breeding systems, and shortening crop breeding processes. This finding about the usefulness and potential of key research outputs was substantiated using different sources of data and information, including interviews and survey results,.

Despite the positive achievements, evaluation recognizes that [GISG](#) breeding and research efforts are stretched across a large number of targets. There are more TPP or more traits built into a TPP than most programs can do effectively without diluting the effort across all TPP. This is a prioritization issue. This issue is further exacerbated by the demands of external funders and bilateral projects leading to excessive reporting

⁶ <https://iaes.cgiar.org/evaluation/publications/evaluation-cgiar-excellence-breeding-platform-eib>.

(e.g., multiple reports with similar content packaged in slightly different ways for different groups) and conflicting demands on staff time, thereby reducing the overall GISG effectiveness. This issue, particularly regarding a reduction in the overall effectiveness of the GISG work, was mentioned and highlighted by initiative and WP leaders across the board during the interview process.

Evaluation findings echo results and agree with recommendations from the recent [Evaluation of the Genebank Platform](#) that reported a lack of mechanisms to encourage linkages between genebanks and breeders, mainly due to the lack of funding for cooperative work and a lack of joint objectives. Enabling a better integration between the two could further improve GISG effectiveness. Concretely, the evaluation recommendation to “Expand efforts to encourage and facilitate the use of genebank collections” (Rec. 9) still stands.

There was little evidence for a deliberate variety lifecycle management strategy. Entities releasing varieties must manage their entire life cycle, from introduction to discontinuation. The Seed Equal group should help with this process and ensure Market Intelligence can anticipate replacement needs. When discontinuing a variety, an improved alternative must be available to farmers, accounting for characteristics valued by them. These characteristics might not always be known to Market Intelligence and breeders. To adhere to the do-no-harm principle, feedback from diverse farmers is crucial to avoid discontinuing varieties that still hold value, especially for vulnerable communities. While decisions on discontinuing varieties may not be CGIAR’s sphere of control, CGIAR can control that the key traits valued by consumers are part of the new variety.

There is no strong evidence suggesting that there was sufficient integration with other SGs (something expected at least from CGIAR interventions at food-systems level). For example, evaluation findings suggest that there was room for stronger integration with the RAFS SG, especially with the Excellence in Agronomy and Plant Health initiatives, and stronger geographic integration. Such integration could lead to a more production-systems-oriented approach in a target geographic area with stronger positive outcomes in terms of climate resilience, nutrition, and environmental health. Strengthened collaboration and feedback loops between GISG initiatives and partners such as the private sector or large development projects experimenting with/scaling the SG outputs, could render the GISG even more effective to reach envisaged impacts.

Online survey results indicate a generally positive perception among internal stakeholders about improvements in the effectiveness of CGIAR post-2022. However, some internal stakeholders feel disconnected from policy incidence efforts, with 27% (out of 45) unsure about their own role and contribution. One respondent noted: “I am not sure which level of policy pathways we are discussing, and I do not see how my work contributes to country-level policy”. Acknowledging that not all GISG staff are encouraged to interact with policy processes, but rather to focus on their area of expertise (e.g. breeding), this quote could be taken positively. However, it could also mean that some people are not aware, although they should be. It is a survey limitation that the functions and roles of the respondents are not known to the evaluation team.

Feedback on multi-scale governance was mixed among internal stakeholders, with 51% agreeing on its effectiveness but 20% uncertain, highlighting a need for clearer communication (see Annex 6). While almost three in five (58%) support CGIAR’s innovative approaches with some stated earlier, such as TRICOT and Target Product Profiles, concerns about resource allocation and a narrow focus on scaling initiatives persist. Despite concerns, internal respondents manifested strong support to scale the work of successful initiatives to ensure sustained progress and broader impact.

Improvements on the effectiveness of genetic innovation efforts of the CGIAR post-2022 were also reported by several internal and external stakeholders interviewed during the evaluation process. Among external

stakeholders, the factors of improvement most commonly mentioned are the existence of a new integrated approach that looks at crop breeding systems, processes and programs as a whole (pipeline approach), more participation in decision-making processes, improved availability of and access to modern tools and resources, tailored capacity building strategies, plans and processes, and demand led possibilities to improve local crop breeding infrastructures.

It is important to highlight here and throughout the findings section that most of the external interviewees, particularly NARES representatives, can't differentiate and fully understand the value added of the GISG work as one integral part of the CGIAR work. In other words, they see the CGIAR work as one single intervention at crop breeding system level.

5.3 Efficiency

Promising improvements in breeding efficiency are more visible in CGIAR crop breeding programs (based on document reviews as well as on survey and interviews analysis) than in NARES crop breeding programs (based on interviews). Promising improvements in breeding efficiency were identified and evidenced in CGIAR breeding programs since 2022. CGIAR breeding programs build more on strengthened partnerships, shared resources, synergies, and joint learning. Further measures of the GISG to increase efficiency from a governance and management perspective include financial planning security, building more on the comparative strength of each partner, engaging even more with succession planning in breeding programs, and having fewer and more constant CGIAR contact persons interacting with the NARES in each target country, avoiding redundancy and conflicting requests. Additional collaboration and feedback loops with private sector partners is also increase efficiency. Training on management as part of GISG activities seemed to be effective and efficient, leading also to improved succession planning and reporting, and continuity of breeding programs.

Many of the interviewees (internal stakeholders) felt like they were being pulled in many directions and could not focus as they used to since 2022. From an evaluation perspective that could be a clear positive indication of them being pushed to think and act outside the box (systems thinking under circumstances of uncertainty and emergency). However, at ground level (CGIAR and NARES crop breeding programs) it could also negatively indicate that they had to respond to individual demands from initiatives and even WPs, compromising not only the efficiency of GISG work, but also the efficiency of CGIAR and NARES crop breeding programs. Many internal and external interviewees felt like crop breeding programs were being asked to breed for more TPPs than they had resources for (product development and delivery). The evaluation teams see an opportunity for open and honest dialogue and a co-creation process to determine the realistic number of TPPs that can be developed by specific CGIAR and NARES crop breeding programs, followed by a transparent identification and prioritization process.

What are the internal and external factors influencing GISG efficiency within a system of fully independent centers, considering the constraints of limited resources?

Large discrepancies between the planned and approved budgets for GISG initiatives are affecting efficiency. The following summarize sentiments from internal stakeholders:

"Firstly, finance has been a significant issue. The problem lies in the uncertainty surrounding our budget at the beginning of each year. There have been instances where our budget has changed unexpectedly, sometimes even being cut halfway through the year. This makes it incredibly challenging to plan and execute our initiatives effectively, especially when it comes to agricultural projects where timing is crucial."

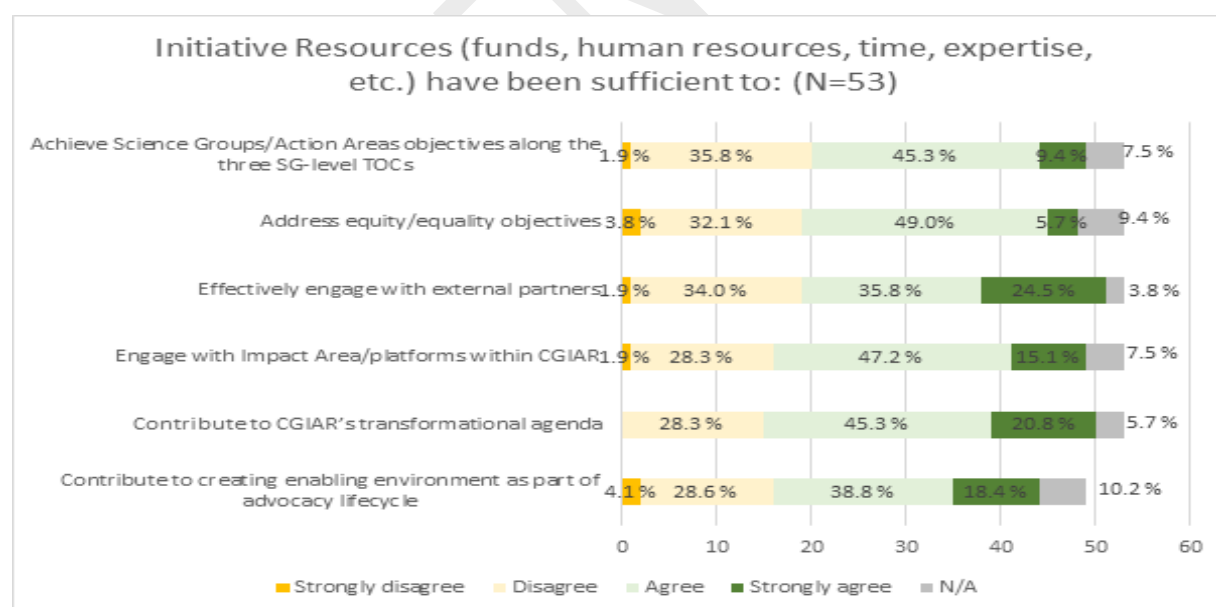
"Regarding challenges, at the initiative level there has been a 60% budget cut while at the work package level about a 20% budget cut."

Additionally, another internal stakeholder emphasized the broader impact of financial constraints, explaining that these financial issues emphasized the need for more stable and predictable budgeting to ensure the effective planning and execution of GISG initiatives (see Efficiency section).

Moreover, key external informants consistently highlighted the challenge of dealing with multiple and frequently changing CGIAR contact persons. So far, the SG constellation does not appear to have reduced the number of CGIAR contact persons compared to the previous system of having contacts at each individual CGIAR center. Each new contact person forces NARES partners to re-explain the context, leading to inefficiency. A reduction in the number of contact persons to one per country and two per region and documenting internal briefs/materials for onboarding new CGIAR contacts, could increase the efficiency of GISG work. The current situation, with multiple contact people and a lack of feedback loops, results in conflicting and redundant requests to CGIAR and NARES breeders, making them inefficient.

Furthermore, the online survey revealed that almost 36% of the internal stakeholders felt that the initiative's resources—funds, human resources, time, and expertise—were insufficient to achieve the expected outcomes (see Figure 9 below). Many respondents also believed that the efficiency of the entire system could be improved with increased funding and capacity building for NARES. There is a contradiction between the highly efficient reported outputs, the considerable budget cuts that negatively impact this efficiency, and the negative perception among internal and external stakeholders regarding the likelihood of achieving expected outcomes due to insufficient resources.

Figure 9: Internal stakeholders' opinion on the level of adequacy of resources to achieve specific Outputs and outcomes–GISG



Source: IAES SG Evaluation Survey, 2024

The general sentiment of respondents revealed the need to continue and reinforce the ongoing efforts to increase the efficiency of the CGIAR–NARES collaboration system by sharing resources, reducing redundancies, learning from each other, fostering synergies, and presenting a unified intervention strategy. The specific suggestion was to reduce the number of centres and stations, and improving the performance

of those that remain. The informant suggested that CGIAR should "be as centralized as possible and as decentralized as needed". However, structural changes involve more than just efficiency; they also relate to politics, ownership, and other factors. Therefore, the challenge lies in determining how and at what level this can be best achieved in future science programs.

The evaluation team found evidence of visible actual improvements in crop breeding efficiency within CGIAR and NARES programs because of the GISG work in terms of financial planning security and better partner collaboration. Some interviewees revealed concerns about being stretched too thin and the need for more transparent TPPs prioritization processes. In other words, there is a need for more prioritization in the number of TPP and/or in the required traits of the TPP that better match what the breeding network can achieve. Significant discrepancies between planned and approved budgets for GISG initiatives impact efficiency, with stakeholders noting unexpected budget changes and cuts. The challenge of dealing with multiple CGIAR contact persons leads to inefficiency, and streamlining contact points is suggested. These points highlight the need for stable budgeting and efficient management to optimize the effectiveness of GISG initiatives.

It took longer than expected to put the overall GISG work up and running. The roll-out process required: 1) building a new governance structure, reaching a basic understanding about change and contribution; 2) negotiations and agreements with internal and external stakeholders specifying roles and responsibilities; 3) looking for and hiring human resources with specific experience and expertise; and 4) developing and implementing new management systems, processes and tools. Targeted capacity development at different levels, on one hand negatively affects the efficiency of GISG work on a short-term basis, and on the other hand, positively affects it on a medium- to long-term basis. In any case, there is no sufficient evidence suggesting that identified shortfalls negatively impacted the GISG work. The envisaged transition to science programs should be designed in a way to assure continuity where appropriate and implement changes only where needed. A lengthy and inefficient startup period as with the GISG should be avoided.

In summary, GISG initiatives face efficiency challenges due to the highly erratic inflows of finance to GI that do not fulfill the required budgets. Some key external stakeholders suggest reducing the number of contact points from CGIAR and improving resource allocation. Enhanced funding and capacity building for partners is essential for achieving desired outcomes and improving overall crop breeding systems, processes and program performance.

5.4 Coherence

The GISG activities are highly coherent, given the consistent approaches in plant breeding across crops. Feedback from Market Intelligence is effectively utilized to provide the product development team with relevant breeding resources. The roles of individual initiatives were clearly defined, specifying their interventions at various stages of the crop-breeding process and detailing their contributions through relevant scientific outputs. Additionally, the relationships between the work of the initiatives and the wider GI work in CGIAR (bilateral, W3 and science project funding) were well elaborated for the largest grants. To further corroborate this finding, the online survey results showed that over two-thirds of both the internal and external stakeholders acknowledged the coherence of GISG initiatives. Survey results (see Annex 6) reinforced this finding, showing that coherence has reduced research duplication and improved alignment of interventions (about 21% of respondents disagreed). One member of a NARES said:

"We collaborated with CIMMYT to streamline variety development across different countries and avoid duplication of efforts. In Uganda, the focus was on brown finger millet, while Tanzania concentrated on light brown finger millet, ensuring that resources were optimally allocated."

Furthermore, an internal CGIAR stakeholder remarked the following on center priorities:

"Overall, there is a commitment to coherence and alignment with [CGIAR] center priorities, with ongoing efforts to enhance collaboration and efficiency within the group."

Although the initiatives and WPs are coherent, the details of their operations, mechanisms, effects on the crop-breeding process, synergies, and overall impact are not clearly understood by all stakeholders. These concerns likely stem from issues with clarity in communication. Furthermore, demands from bilateral and externally funded projects can dilute GISG's focus and coherence, and despite considerable effort over the past two years, there's still room for improvement in aligning with the market needs and preferences of national partners.

Several interviewees mentioned that the strong donor dependency of NARES and a certain conflict between external priorities and local needs can hinder implementation of their own coherent priorities. Some NARES scientists wish to include locally important, nutritious, niche or underutilized crops in their breeding work, and the question raised was, whether this could be integrated in GISG work, although these crops are beyond the currently CGIAR-bred crops. CGIAR does not have a small budget for each partner country or for NARES to implement genetic and phenotypic diversity studies, nor for initial genetic improvement activities in minor, locally important crops (especially those that play a role in food and nutritional security and climate resilience of the most vulnerable and poor farming communities and/or women farmers). In a geographically focused, holistic and production/food-systems-oriented approach, including locally important crops would add coherence. This issue can also hinder the potential outcome and impact of GISG work. In the context of limited resources, CGIAR should at least continue to support the work of NARES and universities in partner countries to work on diverse crops primarily via capacity support-i.e. including breeding teams of 'minor, 'orphan' and 'opportunity' crops in common data architecture, training opportunities, and access to equipment and services (including externally procured services).

In what ways has the GISG addressed key considerations and opportunities for enhancing coherence across, between, and within SGs?

A key to success of variety adoption is to predict performance in the cropping system in which it will be grown. When asked, several NARES breeders who were interviewed indicated that there was not enough attention given to how the crop was going to be grown or what type of cropping system, if any, it would be part of. There are many potential variables to be considered, these include intercropping, relay cropping, organic/regenerative, systems, and double cropping. Neglecting the target cropping system in breeding efforts reflects a lack of coherence between GISG and other SGs, especially RAFS and ST. This issue needs to be solved if there is to be real impact. It points again to the need of a more systems-oriented approach in breeding, better integration with RAFS and ST SGs, and the potential usefulness of geographic integration during implementation of future CGIAR science programs.

In summary, the GISG activities are highly coherent due to their consistent approaches in plant breeding across centers, programs and crops and more effective use of feedback loops among initiatives, notably from Market Intelligence to breeding programs. Clear role definitions and interventions for various stages of crop breeding have been recognized by over two-thirds of survey respondents (internal stakeholders). However, there is a gap in considering how crops will be grown in specific cropping systems, leading to a potential misalignment with RAFS and ST groups and a missed opportunity to tackle climate resilience, better nutrition and environmental health.

5.5 Quality of Science

To what extent does the GISG ensure the QoS (scientific credibility and legitimacy)?

5.5.1 Design

The GISG largely ensured the production of high-quality outputs by considering users, practical uses and potential implications, which explicitly addresses the influence they are going to have among key stakeholders, and, to the specific contributions they are going to make to the achievement of expected outcomes and transformative change at systems level, as specified in the ToC. The survey results align with this finding, showing that over 90% of internal stakeholders perceive the research outputs of GISG as credible (see Annex 6). One statement supporting this view is: "CGIAR's research outputs are consistently reliable and trusted by the scientific community".

5.5.2 Inputs

Uncertainty in financial and human resources was the norm much more than the exception for GISG. Several interviewees (internal stakeholders) stated that there is always a risk of losing highly specialized, trained, and valuable human resources who are unwilling to cope with uncertainty about funding and emergency (rapid reaction to changes, no sufficient time to think about potential implications and discuss changes with external stakeholders, particularly NARES), inevitably affecting the continuity of research efforts and the production of high-quality outputs.

The survey findings corroborated the uncertainties surrounding the inputs of research at GISG that could pose a quality risk to the outputs produced. Stakeholders consistently highlighted issues related to funding and resource management. Decreased funding and increased competition for financial resources were common themes, with one comment noting the scaling down of funding and the need for accountability for funding across different centers. The unpredictability of resources (the bane of CGIAR interventions) complicates research continuity, impacting the design and implementation of research. One participant observed, "Continuous downsizing or adjustments affect the quality of research design".

5.5.3 Processes

The evaluation team found several examples of collaborative processes that supported the production of high-quality scientific outputs. One is the integration between [the GloMIP](#) and the [Breeding Portal](#) that now aims at also integrating Seed Equal data and information (something to be encouraged and supported). The integration of these platforms underlines CGIAR's commitment to findable, accessible, interoperable, and reproducible (FAIR) data principles, open science, responsible innovation, and equal partnerships.

Although there is a [CGIAR Research Ethics](#) Code that guides CGIAR efforts, there seem to be no effective mechanisms in place that guarantee the participation of external stakeholders in the production of high-quality scientific outputs. Several interviewees from NARES manifested that their work and contribution should be more recognized, that they should be more effectively involved in production processes and be part of capacity-building initiatives (mentoring by CGIAR to better contribute to and lead the production of high-quality research outputs). More recognition and effective participation of external stakeholders, not only NARES, can enhance ownership among external users, accelerate use, and improve the relevance of GISG work.

5.5.4 Outputs

The GISG research outputs have generally been perceived as of high quality. Over 85% of internal stakeholders that responded to the online survey agreed that the GISG produced high quality research outputs (see Annex 6) and perceive that they are highly relevant for targeted users. Several key external stakeholders interviewed (actual and potential users of GISG science outputs), including NARES, the private sector and donors, recognized the usefulness as well as the actual and potential contribution of key GISG science outputs to the improvement of breeding systems, processes and programs at national, regional and

global level. The QoS analysis further supports this finding, showing an impressive number of website visits and downloads of a sample of key GISG science outputs purposefully selected by initiative leaders to be used as part of the QoS analysis.

Additionally, the development, availability and accessibility, and potential of TPPs (GloMIP) has been widely recognized by internal and external stakeholders (developers as well as targeted users). The use of GloMIP transcended the CGIAR sphere and it is already informing GI efforts at country and regional level. As one internal stakeholder noted during an interview:

"We have developed product profiles in the region with the GloMIP, with a team including breeders, social scientists, agronomists, and pathologists. We have successfully created four product profiles as a team in the region. These profiles have been applied in Uganda, Kenya, Ethiopia, Zambia, and Malawi. We are now looking to implement them in other countries where they are not yet a commodity."

Another good example of QoS is the GI toolbox, which sought to provide services that could be effective for standardization. This comprehensive resource includes user-validated tools, services, best practices, and learning materials developed or curated by the GISG to improve breeding programs, seed systems, and the safeguarding of genetic resources for standardizing procedures and enables other initiatives and programs to apply consistent methodologies. This was noted by an internal stakeholder as follows:

"In terms of service efficiency and process improvement, we have developed a process team with key operational leads from centers like IITA, CIAT, and IRRI. We facilitate the process through internal examples and process champions and sometimes seek help from external consultants. The goal is to establish standard operating procedures that everyone can agree on and follow, whether at IRRI headquarters or IITA headquarters. This allows everyone to generate and maintain farm operations using the same process for quality management and costing."

However, several internal stakeholders highlighted a need for even more standardized protocols and methodologies to improve the quality of GISG science outputs. As stated earlier, such protocols should also have formalize mechanisms of participation and recognition of internal and external stakeholders as noted by two interviewees:

"In terms of delivering quality science, it is important to have a common methodology. When everyone uses their own approach, you get inconsistent results. The harmonization of methodologies is essential, especially when we are talking about things like seed quality. If everyone is working with a different methodology, the final outcomes would not be reliable."

Another key element of QoS is legitimacy, which encompasses fairness and ethical practices in the research process. These aspects are important for establishing strong and trusted partnerships. The intentional inclusion of NARES, the private sector (for both seed delivery and value chain linkages), and gender considerations in the activities of Market Intelligence and Seed Equal initiatives exemplify the commitment to legitimacy and stakeholder acceptance of research outputs. An example of a partnership that enhanced the legitimacy of research processes was revealed by some stakeholders as follows:

In summary, this evaluation found strong support for common approaches and mixed views on whether CGIAR has progressed far enough yet. The emphasis on developing standard operating procedures and the introduction of resources like the GI toolbox illustrate the proactive steps being taken to address these challenges. By harmonizing methodologies and providing comprehensive resources, these initiatives aim to ensure reliable research outcomes and improve operational consistency across various institutions.

Consequently, the pursuit of standardization remains an important factor in enhancing the quality and reliability of scientific research and operational processes.

"We are actively involved in co-designing research activities within the network. Together, we are working on regional trials, product profiles, and research protocols. This collaborative effort is promising to see."

"We have made significant progress in uniting stakeholders, allowing us to speak with one voice regarding seed systems work. This includes innovations, tools, and methods, which were previously scattered across various centers."

Additionally, the perception of legitimacy in CGIAR's research, held by about 85% of the internal stakeholders that were part of the online survey, highlights the importance of integrity and transparency in research practices (see Annex 6).

In conclusion, the deliberate inclusion of diverse stakeholders and consideration of gender and social inclusion dimensions in research activities significantly contribute to the legitimacy and acceptance of scientific outputs. The collaborative efforts in co-designing research and the focus on gender-specific impacts demonstrate a commitment to ethical practices and stakeholder trust. Although a small proportion of the online survey respondents expressed concerns, the overall trust in CGIAR's research methodologies and ethical standards is evident. The emphasis on integrity, transparency, and fairness in research practices is essential for sustaining this trust and ensuring the legitimacy of scientific endeavors.

The GISG ensures high-quality outputs by considering users, uses, and potential implications. The ToC guides their efforts at the crop breeding systems level. Survey results show that over 90% of stakeholders perceive GISG's research outputs as credible. Inputs, including financial and human resources, play a crucial role in research continuity. However, recurrent changes, uncertainty, and emergencies impact the availability of specialized resources, affecting output quality. Collaborative processes have led to high-quality scientific outputs. Notably, the integration of the GloMIP and the Breeding Portal emphasizes CGIAR's commitment to FAIR data principles, open science, and equal partnerships. Stakeholders recognize GISG's research outputs as highly relevant and useful. Over 85% of internal stakeholders agree on the high quality of these outputs. product profiles extend beyond GISG, adopted by other scientific groups and applied in multiple countries. Standardized research methodology remains a challenge for some stakeholders.

5.6 Partnerships

The GISG has shown a considerable level of collaboration within its initiatives, SGs, with NARES and with Advanced Research Institutions (ARIs).

There are examples of effective partnerships, for example with Intertec for genotyping services and the International Maize Improvement Consortium (IMIC). Reoccurring themes and recommendations on this matter are documented in the High-level advisory panel report to CGIAR System Board on improving CGIAR Strategic Engagement with Partners 2023. With little familiarity with the A CGIAR Engagement Framework for Partnerships & Advocacy (2022) there was a missed opportunity at CGIAR corporate level to pull out the key lessons from each of these and put together short effect training modules to be cascaded through the CGIAR SGs along with training on how to build trust and real communication so that these well-researched reports achieve the impact they are intended to have.

The GISG effectively leverages CGIAR's and its partners' capabilities to create innovative partnership models in fostering an environment conducive for research, testing, and scaling innovations. The survey findings tend to corroborate the existence of strong partnerships. For example, more than 80% of the internal

stakeholders that responded to the online survey agreed that CGIAR was effective in forging partnerships across the global south, and with SMEs, social scientists, policy advocates, and political economy experts to advance the course of CGIAR. An example is the launch of the Breeding Academy in 2023 with financial support from BMZ/GIZ.

Interviews also revealed that partnerships between GISG and its stakeholders have been strengthened due to a standardized methodology for partnering with NARES. This methodology is used for peer and self-assessment of CGIAR and partners' breeding activities, defining partners' capacities and roles based on their strengths and mandates. It provides baseline information for understanding optimal contributions to CGIAR–NARES breeding networks and the evolution of these roles over time. For example, in one country, the national breeding program now handles final hybrid development, while a CGIAR center focuses on upstream research. In another country, a national program has received additional funding to lead maize hybrid development for the highlands, leveraging its comparative advantage over other CGIAR centers. These examples illustrate a shift towards equal partnerships based on comparative advantages within CGIAR–NARES regional breeding networks in sub-Saharan Africa.

However, there is a lack of clarity about the partnership approach with some NARES, as some could not identify which initiatives their breeding programs align with. Additionally, the understanding of the GISG strategy, initiatives, processes, and individual roles varies significantly among NARES partners, causing uncertainty about their involvement in specific initiatives and WPs. Better communication could help to overcome these issues.

Another area where the partnership between GISG and its stakeholders was effective is in capacity development and continuous training. These efforts have reportedly contributed to shift the mindset of NARES towards continuous improvement of the breeding pipeline. Previously, NARES focused on time-bound projects rather than ongoing and consistent breeding programs. As one internal stakeholder stated:

"We offer training to enhance capacity and support sustainable operations. These training sessions are conducted regionally and involve multiple centers and stakeholders. The goal is to share knowledge and foster collaboration among different institutions."

However, some external stakeholders reported that the current level of training from GISG is insufficient, and for sustained partnerships, more extensive training should be organized. As some external stakeholders stated:

"To ensure sustainability, it is essential to invest in capacity building, as national programs often lack resources compared to CGIAR centers. This investment would enable national programs to perform basic tasks locally without relying entirely on external support."

"Providing more opportunities for joint training and knowledge sharing among different institutions and breeding programs will further enhance efficiency and promote synergies across the network."

The launching of the Breeding Academy in 2023 with BMZ/GIZ financial support is an excellent step to intensify training of breeders.

A strong example of a public–private partnership within the CGIAR system is the International Maize improvement Consortium (IMIC), launched by CIMMYT in 2018. IMIC is a public–private partnership designed to strengthen maize breeding programs of partner institutions worldwide. As part of this initiative, CIMMYT organizes annual field days which bring together representatives from seed companies and NARES partners. Such events serve as a catalyst to drive innovations in maize breeding programs, deliver solutions to stakeholders, and enable seed companies and NARES partners to make informed selections tailored to local contexts. They also enable CIMMYT to showcase genetically diverse maize lines, have structured dialogues

with diverse stakeholders, and review and refine breeding strategies and approaches. The IMIC approach is exemplary, and there is a need to develop similar models for other crops under the GISG mandate.

Another example and learning opportunity for the GISG is the new [GoSeed](#) initiative from IITA's Business Incubation Platform. This initiative is producing and marketing quality breeder and foundation cowpea seeds to private seed companies for distribution and sale to farmers. Awareness and use of quality certified seeds of improved IITA cowpea varieties is expected to improve farmers' yields, livelihoods, and food and income security.

In summary, evaluation found that GISG's collaboration with NARES and private sector groups is strong, leveraging CGIAR's capabilities to foster innovative partnerships. These partnerships have been strengthened by a standardized methodology for collaboration and continuous training efforts, which have improved the breeding pipeline. The International Maize improvement consortium led by CIMMYT and the IITA-led GoSeed initiatives are exemplary for private-sector cooperation and could serve as models for other GISG crops. Furthermore, there is variability in the understanding of GISG strategies among NARES partners. Addressing these gaps through more extensive training and clearer communication of roles and initiatives will further enhance the effectiveness and sustainability of GISG's partnerships.

The GISG prioritized building private sector partnerships with a consistent approach. This is a summary of identified GISG achievements on this matter:

- Established the [Private Sector Platform](#) to act as a one-stop shop and level playing field for work with the multi-national large-scale private sector, situating the leadership of this in [IITA](#), where there is groundbreaking partnership work, as the evaluators identify.
- Secured financial (and technical) support from [BMGF](#) to support the platform and avoid too much dependency on private sector partner finance.
- Undertook a stakeholder mapping of the major multi-national firms with which to seek partnership under the platform; Systematically engaged with the priority identified partners to establish working partnerships on key areas, particularly capacity strengthening and in-licensing of genetic tools ([Bayer](#), [Syngenta](#), [Corteva](#), [Limagrain](#), [SeedCo](#)).
- Generated a set of universal principles to guide private sector partnerships.
- Worked with CGIAR legal teams and the CGIAR Private Partnerships for Impact ([PP4I](#)) team to develop a CGIAR Licensing Framework to guide best practice in contracts and royalties when transferring germplasm to private sector users.
- Systematically included small and medium enterprises in the Breeding Networks associated with crop-geography market segments.
- Made sure to invite private sector into the GI advisory Group (the experience from the horticulture sector, via [East-West Seeds](#), seemed to be especially helpful).

The limits and opportunities of GISG work in the light of what the private sector is already doing, and the extent to which the GISG should consider, adopt and adapt crop breeding strategies, systems and processes of the private sector, were not fully explored. For example, several internal and external interviewees mentioned that successful private companies should allocate significant resources on marketing and agronomic support of new varieties, highlighting a significant gap in GISG work that can limit adoption at scale of new varieties. There is no evidence suggesting which one of the partners should do it in the future.

5.7 Gender and Social Inclusion

The GISG has effectively integrated gender and social inclusion considerations into its processes and breeding activities. The Market Intelligence initiative, in collaboration with other initiatives, have

effectively incorporated these cross-cutting themes into product profiles and breeding programs through its GloMIP platform.

A review of [the CGIAR Gender Platform Summary Report 2020–2021](#) highlighted several important research partnerships. Notable collaborations included one with the Food and Agriculture Organization of the United Nations (FAO) focusing on COVID-19 and climate change, and another with the Alliance for a Green Revolution in Africa addressing evidence gaps related to women in agriculture. This demonstrates the CGIAR Gender Platform's proactive approach in forming strategic alliances with significant organizations and its strong commitment to advancing gender-responsive research and solutions in these vital areas.

Additionally, the CGIAR Gender Platform Summary Report 2020–2021 reported significant progress in advancing the CGIAR Impact Area on Gender Equality, Youth, and Social Inclusion by actively participating in the development of CGIAR's new Research Initiatives. The Platform ensured that gender considerations were incorporated into the Initiative templates, shared gender research resources with all Initiatives, reviewed and provided advice on integrating gender into all Initiative proposals, and supported the inclusion of gender in the Theory of Change for Initiatives. This further corroborates that the Platform played an essential role in embedding gender equality and social inclusion into CGIAR's new research initiatives, highlighting its commitment to ensuring these considerations are central to CGIAR's work.

Finalized during the GISG evaluation, the development of [The Genetic Innovation Gender Strategy](#) was a key achievement. It aims to address gender inequality in the adoption and benefits of new crop varieties providing a road map for the best-bet investments in gender-intentional breeding. The timeframe for the Gender Strategy covers five years from 2024–2028, and it is expected that by 2028, all genetic innovation initiatives of the CGIAR should practice gender-intentional breeding in all its priority crops and market segments. There is strong evidence suggesting that the GISG is going to achieve its gender and social inclusion goals by 2028 as demonstrated in the subsequent paragraphs.

The [GloMIP](#) offers over 200 indicators and allows stakeholders and donors to prioritize impact areas such as gender equality, climate resilience, and nutrition and health outcomes. The involvement of social scientists in the Market Intelligence work ensures that social inclusion and gender issues are effectively addressed.

Furthermore, the evaluation found that gender-related trait preferences are integrated into the product profiles developed by Market Intelligence in cooperation with NARES, which are subsequently incorporated into the product design. This strategy was highlighted as follows:

"Regarding the gender strategy, it has been integrated into various aspects of our work, particularly in market intelligence, accelerated breeding, and seed systems. We have focused on ensuring gender equity in product development, market approaches, and stakeholder engagement."

Survey findings confirmed the integration of gender and social inclusion, with over 70% (see Figure 10) of internal stakeholders agreeing that gender tagging of initiatives at the design stage has helped focus on targeting rural, resource-poor women and the most disadvantaged groups. Additionally, over 50% of the internal stakeholders believed that gender tagging effectively addressed equity, inclusion, and gender equality. However, almost 23% of the internal stakeholders disagreed that gender tagging helped focus on these areas, possibly indicating that gender tagging alone is not a strong enough tool. These contrasting views revealed that while a significant proportion of respondents perceived the gender tagging efforts to be effective, some did not share this view.

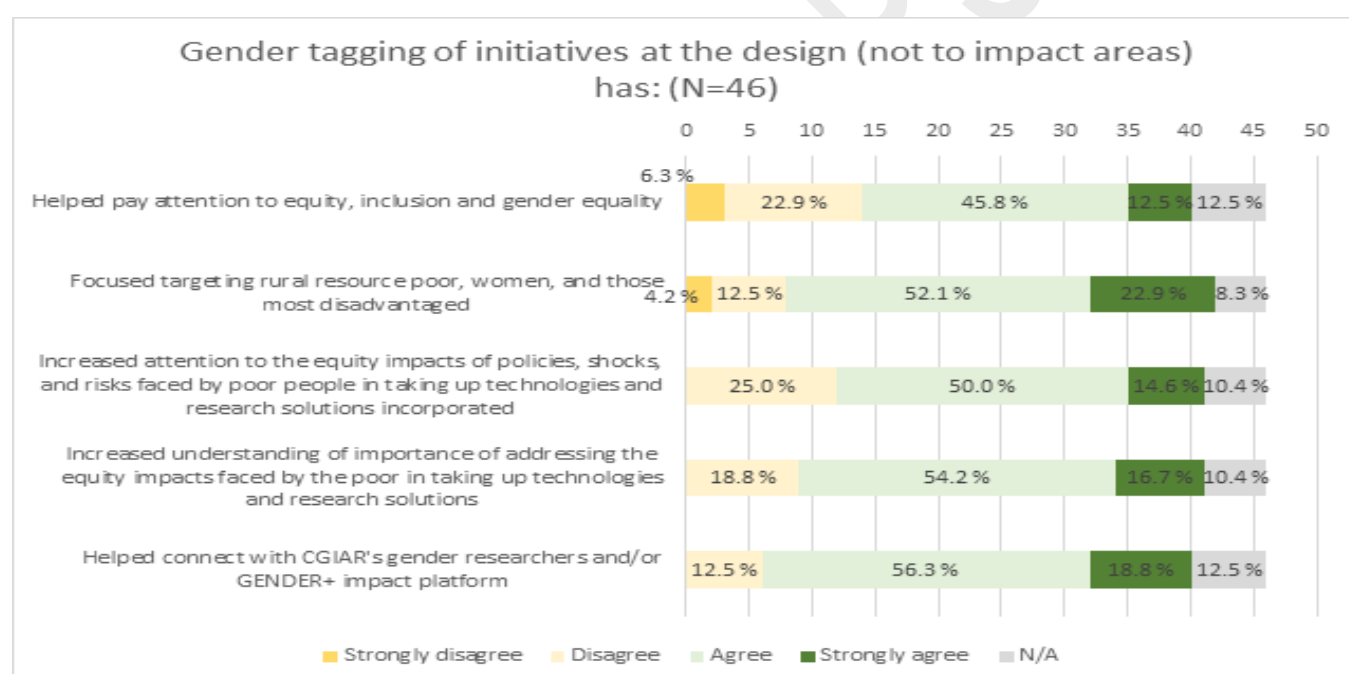
The breeding activities of GISG reflect a strong commitment to gender and social inclusion. Interventions were implemented to ensure the inclusion of men, women, and youth, recognizing that traits affect these

groups differently. These interventions aim to enhance traits to meet the specific needs of each group, thereby improving legitimacy and acceptance. A stakeholder reinforced this point by stating:

"This is what we are currently focusing on regarding gender. We are not suggesting changes to the traits being bred for but are conscious of the impact these traits may have. Some traits may affect men, women, and youth differently. We need to consider what each trait means for each group. This awareness does not change the breeding process, but it ensures breeders understand the implications of the traits they develop. For instance, higher yields are beneficial, but their impact can vary across different demographics."

Furthermore, approximately 80% of internal stakeholders perceive that GI is effectively addressing equity concerns, with 75% acknowledging GI's attention to the challenges faced by poor populations. However, 25% of respondents expressed disagreement, stating that there has not been sufficient focus on the equity impacts of policies, shocks, and risks encountered by poor individuals when adopting technologies and research solutions (see Figure 10).

Figure 10: Internal Stakeholder: The level of gender tagging of initiatives at the design stage-GISG



Source: IAES SG Evaluation Survey, 2024

5.8 Review of Uptake of Recommendations from the 2021 synthesis report and the associated MR Action Plans

An assessment of the evaluation team by individual recommendation is contained in Annex 8. It presents commentary about the level of uptake of all recommendations that are part of the [2021 synthesis](#). The implementation is progressing well as shown in Table 2.

- Cross-Cutting Recommendations: Out of 18, 13 are in progress, 4 are completed, and 1 is delayed.
- GI Specific Recommendations: All 7 are in progress, with none completed or delayed.

Table 2. Status of the uptake of recommendations from the 2021 synthesis report

Category of recommendation	Total No. of recommendations	Status of Implementation		
		Progress	Completed	Delayed
Cross-cutting Recommendations	18	13	4	1
GI Specific Recommendations	7	7	0	0

Source: [2021 Synthesis Report](#)

6 Conclusions and Recommendations

This section presents conclusions based on key findings, followed by the recommendations, subject to Management Response⁷ by responsible CGIAR stakeholders.

6.1 Conclusions

The GISG work is highly relevant to fostering higher genetic gains in farmers' fields. National partners feel involved but wish to be granted more leadership and decision-making power which could further increase national relevance.

- More explicit feedback loops between product delivery and product design and development activities have the potential to further increase relevance.
- A more production/food-systems-oriented breeding approach, and better integration with RAFS, especially with agronomy and plant health research, could further strengthen the relevance of GISG activities and impact in terms of climate change adaptation and nutrition.
- More could be done in terms of exploring plant genetics for environmental benefits, to achieve the desired impact on environmental health (e.g. specific adaptation to lower input systems and organic manure, mixed/intercrop systems that foster agrobiodiversity, promote beneficial insects, carbon sequestration and climate resilience amongst the most important).
- Triangulation of regional/national, scientific and funder priorities remain important and should be further pursued.
- The GISG [ToC](#) is well articulated, but efforts to communicate the relevance of the GISG work to external stakeholders need to be strengthened.

Despite the uncertainty regarding resources availability and allocation, GISG work was effective in conducting activities and delivering research outputs as planned and expected. Building on previous work by EIB, the shortening and streamlining of breeding processes both at CGIAR and NARES is exemplary.

- A better integration of [Genebanks](#) and breeding activities could further enhance effectiveness of the genetic innovation efforts. Effectiveness and clarity about roles and responsibilities in terms of policy influence were less evident.
- Care should be taken to not overstretch the breeding effort across too large a number of targets.
- Redundant or conflicting requests to scientists should be avoided, as these reduce effectiveness of the GISG.

⁷ To be available on GI SG evaluation page <https://iaes.cgiar.org/evaluation/science-group-evaluations/genetic-innovation>

- Stronger geographic integration of GISG with RAFS and ST SGs, with transdisciplinary teams optimizing the entire production/food system in target ecologies, could lead to even stronger outcomes in terms of climate resilience, nutrition, and environmental health.
- Closer collaboration with the private sector could enhance the effectiveness of scaling GISG-developed varieties.

GISG's collaboration with NARES and internal SGs was strong, leveraging CGIAR's capabilities to foster innovative partnerships. These partnerships have been strengthened by a standardized methodology for collaboration and continuous training efforts, which have improved the breeding pipeline.

- CGIAR and GISG could benefit from further and more intentionally developing their partnerships with the private sector. The International Maize improvement consortium led by CIMMYT and the IITA-led [GoSeed](#) initiatives are exemplary for private sector cooperation and could serve as model for other GISG crops.
- There is variability in the understanding of GISG strategies among NARES partners. Addressing these gaps through more extensive training and clearer communication of roles and initiatives will further enhance the effectiveness and sustainability of GISG's partnerships.

The GISG demonstrates a significant level of collaboration within its initiatives, other SGs at CGIAR, and with NARES and ARIs. The review highlights GISG's effective utilization of CGIAR capabilities, and its partners' capabilities, to create innovative partnership models conducive to research, testing, and scaling innovations. Survey findings also support the existence of strong partnerships, with over 80% of stakeholders acknowledging CGIAR's effectiveness in forging partnerships across the global south and with SMEs, social scientists, policy advocates, and political economy experts.

- The standardized methodology for partnering with NARES strengthened partnerships, allowing for peer and self-assessment of breeding activities and defining partners' roles based on strengths and mandates. Examples illustrate a shift toward equal partnerships within CGIAR-NARES regional breeding networks in sub-Saharan Africa. Challenges still remain, including unclear partnerships with some NARES and varying understanding of GISG strategy among partners.
- Improved communication and more extensive training are essential for sustained collaboration.

The GISG successfully integrated gender and social inclusion considerations into its processes and breeding activities. Collaborating with other initiatives, the Market Intelligence Initiative effectively incorporated these cross-cutting themes into product profiles and breeding programs through its GloMIP platform. The GloMIP platform offers over 200 indicators, allowing stakeholders and donors to prioritize impact areas such as gender equality, climate resilience, and nutrition and health outcomes.

- Social scientists' involvement ensures effective addressing of social inclusion and gender issues.
- Gender-related trait preferences are integrated into product profiles developed by Market Intelligence in cooperation with NARES, subsequently influencing product design.
- Survey findings confirm the success of gender tagging at the design stage, focusing on rural, resource-poor women and disadvantaged groups while promoting equity and inclusion.

6.2 Recommendations

1. GISG: Develop a transitional plan for GISG (the next six months and roll-out starting in 2025)

- Acknowledge and build upon past accomplishments:** Document and leverage foundational achievements while addressing challenges from the past two years to inform the Breeding for Tomorrow (BT) Program design and implementation.

- b. **Minimize unnecessary changes:** Maintain consistency in effective processes, leadership, teams, and partnerships to foster ongoing success.
- c. **Enhance breeding programs and partnerships:** Strengthen CGIAR and NARES breeding programs, their interactions, and public-private partnerships.

There are foundational accomplishments and challenges that have been identified and addressed over the past two years. These need to be recognized, nurtured, and built on in the next design. It is highly recommended to minimize unnecessary changes in process, people leadership, teams, and partnerships. It is imperative that the right voices that understand this are leveraged and included as the next design is being developed. It is highly recommended that in the next phase there is a commitment to provide as much continuity at all levels as possible. This includes continuity of breeding targets, processes, leaders, and partnerships. Continuity is a key success factor for partnerships as well as the crop breeding pipeline. As breeding priorities are developed, long-term needs must be considered to provide the best level in continuity of breeding targets as possible. Continuity of process is also key. The temptation to fix a problem by changing the organization design or team members must be avoided until it is fully understood if it is design issues that provides the challenge or something else. There are many things working well and GISG is making progress, every effort should be made to minimize unnecessary changes. However, it is critical to acknowledge from the outset of the design process that the status quo will not get the BT Initiative to its intended destination.

As all the complex issues are being worked on, it is imperative that focus stay on enhancing and making purposeful progress in the basics of both CGIAR and NARES breeding programs, and the interaction between them.

2. CGIAR and BT science program writing team/management: enhance partnership effectiveness and communication

- a. **Leverage breeding networks:** Clarify roles and responsibilities of CGIAR, NARES, and partners in product design, development, delivery, and dissemination. Increase NARES's responsibility and autonomy and incorporate Advanced Research Institutions (ARIs), as appropriate.
- b. **Conduct specialized training:** Offer short, impactful training-of-trainers modules for scientists on partnership identification, creation, and management.
- c. **Re-balance resources:** Ensure appropriate balance between product development, product dissemination and lifecycle management.
- d. **Promote participatory budgeting:** Ensure inclusive and transparent budget allocation processes to boost ownership and motivation.

There are recurring themes in existing evaluation reports on how to make more effective partnerships, and it is recommended that these are put together into short effect training modules to be cascaded through SP. These programs need to meet people where they are in the journey of being part of effective partnerships and provide them with tools and training to move to the next level of effectiveness. This partnership toolkit needs to have modules on everything from why partnerships have value, to how to implement a contract and track success. It is unrealistic to expect scientists to have the knowledge and skill sets to identify, create and follow through with partnerships without appropriate training that can be leveraged from global seed companies (e.g., Corteva) or appropriate regional seed companies with local context. Once these training modules are put together, skilled teams need to be available to leaders of groups to help train their teams as they see appropriate. There should be dedicated facilitators for this to ensure that each breeding network has a partnership champion who will receive deep training on creating effective partnerships. Additionally,

a formalized network of champions should be implemented across breeding networks to share key learnings and best practices.

More participatory, inclusive, unbiased, and transparent approaches during budget repartition were recommended by many interviewees, to increase ownership and motivation. Having financial stability that facilitates longer-term planning is far more desirable than facing last-minute budget cuts and financial uncertainty. In this context, also feedback loops to donors could be strengthened as two key informants underlined that as the CGIAR moves to BT, there seems to be a vacuum in communication with donors. Even if that is the opinion of one representative from one single donor, this is an undesirable situation, as they must make an investment case to their organizations, and this can only be done if there is clear communication. There is the Champions and Challengers of Genetic Innovation Group that could serve the communication purpose, but, as a GI-related group, it does not have the mandate to interact with the new post-GI BT writing team. One thing that could be done is to give NARES more responsibility and autonomy wherever possible. This would facilitate better buy in from NARES and may also help to alleviate pressures on GISG staff who have been described by several interviewees as being stretched.

3. BT science program writing team/management: cultivate leadership with a seed business mindset

- a. **Develop an effective leadership team:** Balance scientific expertise with seed business, operational excellence, and change management skills; differentiate technical and leadership roles, dedicating equal effort to both.
- b. **Adopt private sector principles:** Integrate successful private company principles into BT practices to deliver better varieties to farmers more efficiently.
- c. **Provide leadership training:** Offer training at all management levels to build teams based on empathy, trust, and communication. Use proven private sector training modules for soft skill development.
- d. **Align with funders:** Maintain close dialogue with funders to align the seed business mindset with CGIAR center finances while upholding CGIAR values.

The new design must have an effective leadership team that can truly lead and has the mindset of a seed business (e.g. a seed business model starts by clearly understanding how much market demand there is for a variety with the specific TPP and then deciding if the cost of creating that variety is worth the market demand). As the BT is developed and implemented, it is recommended that there is more focus on keep moving from a science organization mindset to a seed business mindset, until a balance between the two is accomplished. To accelerate this, it is recommended to complement the current leadership talents and expertise with purposeful efforts to get the diversity of thought on the leadership that includes more seed business, operational excellence and change management experience. It is unfair to expect trained scientists coming from a more research-centered system to have the experience to master these skills. It is recommended that leadership training be given to the top leadership team as well second and third layers of leaders. There is a significant difference between technical leadership and people leadership. In the next phase, equal effort must be given to both. There are many proven training modules that can be leveraged from private global seed companies and others. Once this layer of leadership is trained, these skills must be cascaded throughout the organization. Success at every level of the organization depends on effective teams built on trust, empathy, and communication. As author Stephen Covey said: "All change goes through relationships at the speed of trust".

One potential downside of this shift in mindset could be reduced revenue to CGIAR centers for externally funded projects with more basic science content and this could impact CGIAR center finances. This issue can be resolved by improved dialogue with funders and NARES to make sure that everyone is aligned. CGIAR

leadership will be pivotal in triangulating between funder requirements and those of regional and national partners. The need for strong dialogue between CGIAR science leaders and funders/donors has never been more pressing and will allow future funding to be more cognate with the work planned for the science programs.

4. BT science program writing team/management: partner for strategic roll-out and operational excellence

- a. **Clarify roles and responsibilities:** Address the current variability in understanding of GISG strategy and individual roles; emphasize effective roll-out, operational excellence, and change management in the new BT science program.
- b. **Balance technical and organizational focus:** Evenly allocate resources between technical solutions and continuous operational improvement.
- c. **Design and implement training programs:** Design and implement training to foster desired behaviors and celebrate examples of success at all organizational levels.

There is a highly variable understanding from person to person about the current GISG strategy and process along with what part of that for which they are responsible. Without an effective roll-out and change management training, no design will be effective. It will be critical as the new program is being put in place to focus on all three areas of design, effective roll-out, operational excellence support including change management. Efforts around technical solutions and organizational structure get attention at the expense of much-needed change management/social skills and continuous improvement in operational excellence, particularly in terms of periodically and critically revising the ToC to inform decision making processes, and continuously improving business management and business processes while empowering employees to implement positive change.

If people have a common goal and want to work together, many organizational designs will work to some degree, but some will be more efficient than others. However, if people lack a common goal, clarity, and willingness to collaborate, focusing on organizational structure will not solve the problem. The problem of the lack of a common goal and people wanting to work together, and ensuring trust exists, must be solved. This is true for both within GISG and for true two-way partnerships with NARES and private companies. It is recommended partners are leveraged to design and implement training to accelerate the journey to this desired state and examples of the desired behavior at all stages of the organization are lifted, recognized and celebrated.

The focus given to role clarity and responsibility in the REORGANISE work package was a good step but needs to be strengthened in the next phase. By the time of the present evaluation, GISG was working toward the development of a workflow management tool—the Program Management Platform (PMP), which is expected to improve workflows across GI activities. In addition to defining common goals and fostering willingness to work together, attention needs to be given to resolving the administrative and managerial barriers to successful collaboration.

5. CGIAR: Enhance GI's role in sustainable agri-food systems

- a. **Promote a common understanding:** Ensure GI's contribution to productivity, nutrition, environmental sustainability, and that inclusion is widely understood.
- b. **Drive Market Intelligence:** Anticipate future genetic innovation needs in response to systemic and other relevant changes.

- c. **Integrate genetic gains in broader contexts:** Combine crop improvement with agronomy and plant health research, promoting crop and varietal diversity for resilience and environmental health traits (e.g. specific adaptation to lower input systems and organic manure, mixed/intercrop systems that foster agrobiodiversity, promote beneficial insects, carbon sequestration and climate resilience among the most important)
- d. **Strengthen geographic integration:** Form transdisciplinary teams to optimize region-specific production and food systems, maintaining methodologies and standards across regions.

Although TPPs clearly include both plant health and agronomy-related traits, the GI teams did not deeply interact with the Plant Health and Excellence in Agronomy teams to understand with more sophistication how breeding interplays with, and can better support, the wider array of agronomy and plant health interventions beyond breeding itself.

While transdisciplinary teams exist within GI, especially in the Market Intelligence Initiative, collaboration outside of GI is recommended. There is need to integrate GI with the SGs of RAFS and ST at country or regional level. Transdisciplinary teams consisting of breeders, agronomists, plant pathologists, economists, nutritionists, and social scientists are needed to address region-specific needs, optimize production/food systems, and collaborate with local partners and policymakers, to enhance climate change adaptation, environmental health, social inclusion, and nutrition. While enhancing the regional implementation focus, consistent methodologies and standards should be maintained across regions. Moreover, further refined effective feedback loops between Seed Equal and Market Intelligence initiatives could inform product profiles and variety replacement strategies.

This means contributing to a new understanding of the idea of genetic gain in a broader context, at the food-systems level. It includes identifying, prioritizing, developing and delivering new varieties of crops based on their potential contribution to the development of sustainable and inclusive food systems. This will require a clear understanding of the food system's needs and priorities at global, regional and national levels, at present and in terms of future sustainability and inclusion. It also requires more effective coordination between key stakeholders at all levels. The BT science program has the potential to function as a global network connector, by guiding and supporting genetic innovation efforts, informing strategic decision-making processes, influencing institutional changes, enabling knowledge sharing and learning, and facilitating coordination among global, regional, and national stakeholders. Additionally, it can more intentionally advocate for environmental sustainability, climate resilience, and social inclusiveness at the food systems level.

6. BT science program writing team/management: insist on a system-wide optimization mindset

- a. **Focus on system optimization:** Shift the focus from optimizing individual roles and processes to enhancing the entire system.
- b. **Document role impacts:** Recognize and celebrate how each role contributes to overall project outcomes.
- c. **Facilitate coordination and collaboration:** Encourage collaboration at regional, national, and global levels with dedicated budget allocations.

Many people are working hard and focused on optimizing their initiative, WP or part of a project. There is an opportunity to facilitate the mindset of putting focus on optimizing the whole system from end to end not just their part. This means that everyone should understand their role and how it affects the parts of the project upstream and downstream from their own role as well as the overall project. The ability to create and

deliver the desired products is only as good as all the necessary parts. This is a behavior and mindset that starts at the top. It is highly recommended that the BT leadership team model this approach, find innovative ways to reinforce it and create an atmosphere where this is an expectation. The leadership should put in place ways to recognize and celebrate this behavior at all levels.

The BT science program should continue supporting individual GI efforts of crop breeding programs (CGIAR and NARES). Furthermore, and most importantly, the BT should encourage, guide, and support promising coordination, cooperative, and collaborative efforts at national, regional, and global levels, between:

- a) CGIAR centers and crop breeding programs;
- b) Crop breeding programs of NARES; and
- c) Crop breeding programs with the private sector, academia, and other stakeholders at different levels. This may require a specific line of work and budget.

7. CGIAR and BT science program writing team/management: rationalize resource allocation

- a. **Address budgeting issues:** Ensure financial stability to support long-term planning and continuity.
- b. **Align funding with goals:** Ensure all funding sources result in complementary goals and activities, providing financial stability and transparent budgeting.
- c. **Foster open dialogue:** Establish candid conversations between funders and BT leadership to prioritize activities and their funding effectively.
- d. **Clarify roles and reporting structures:** Define roles for CGIAR and NARES staff working on BT projects and formalize reporting structures.
- e. **Ensure transparent budget allocations:** Use unbiased methods during budget allocations, considering contingency budgets to handle potential cuts.

To increase the impact of BT projects, financial and social incentives must follow project needs. The original intent was for most of the funding for projects to be controlled by, and allocated through, the GISG. This has not fully happened yet. This resulted in some situations where centers and NARES were trying to balance and focus on both GISG-based projects and bilaterally funded projects, making both less effective. It is highly recommended that candid, open dialogue take place between funders and BT leadership so that there is consensus on priorities along with enough confidence in BT leadership. This way funding can be given to them to allocate. It will be critical for the success of BT that the funding and other incentives must align with their projects.

No organization has unlimited funds and prioritization must be made so the focus can be put on the most critical areas. It must be clear who is making these priority decisions and how they are cascaded through CGIAR, and this must start at the top. There is an opportunity of BT leadership to work closely with funders to come to consensus on the priorities of countries, regions, and partners. The BT leadership could then leverage the expertise of its SG to design programs and products to meet those targeted priorities. It is recommended to implement unbiased and transparent approaches during budget repartitions, especially after a budget cut, to avoid frustrations. Some of the budgeting issues that mentioned in interviews and reports do not allow for longer-term planning, and the need to ensure transparent decision-making regarding budget re-allocations following budget reductions will help to ensure trust and more realistic planning of activities once final budgets are settled each year. Contingency planning needs to be carried out, with a small proportion of budgets to be held back and allocated according to priorities as and when required.

8. CGIAR and BT science program writing team/management: embrace complexity in BT design and implementation

- a. **Utilize complexity tools:** Apply concepts designed for complex interventions in complex systems to guide the BT program.
- b. **Co-create a ToC:** Develop an overarching ToC with key stakeholders for shared understanding and ownership.
- c. **Develop a nested program representation:** Detail pathways to change, contributions, interactions, feedback loops, and assumptions within the BT program.
- d. **Build a complexity-aware PMEL system:** Create a system to fulfil accountability and learning needs, allowing for swift adaptations.

An improved or completely new overarching ToC should be co-created involving key internal and external stakeholders to reach a common understanding about change and contribution (buying-in and ownership at SP level). Immediately after that, the co-creation of specific ToCs for initiatives should be delegated to initiative leaders also involving key internal and external stakeholders to reach a common understanding about change and contribution (buy-in and ownership at initiative level). The process could cascade up to WP level, if pertinent and useful. A nested representation of the BT work explicitly stating change and contribution at different levels, including horizontal and vertical interactions and feedback loops and assumptions, should be the basis for the elaboration of a complexity-aware PMEL system that will serve to fulfil not only accountability but also learning requirements (something critically important not formally addressed the first two years). Furthermore, it could help to more swiftly and informatively react and adapt to change at different levels (uncertainty and emergency).

9. CGIAR and BT science program writing team/management: transition to a new era of transformative change in GI

- a. **Reflect on past efforts:** Build mechanisms to ensure critical reflection on past CRP/SG efforts to inform future strategies and approaches in the BT program.
- b. **Implement periodical learning cycles:** Use critical reflection cycles to manage transitions towards transformative change within the BT program.

Improved systems, processes, mechanisms and protocols, as well as approaches, methods and tools, were developed, rolled out and implemented. Key research outputs were developed, tested, and found useful. A new time for 'big things' is just about to begin through the work of the BT. Assuming that the continuity of the work of the GISG is guaranteed—mediating a critical reflection process about what worked and did not, how, for whom, to what extent, and under what circumstances. By a new time for 'big things', we mean that there is a good chance that through the BT work, transformative changes in the way GI efforts are conceived, designed and implemented at CGIAR level will have great influence at global, regional and national levels, eventually contributing to transformative changes at food-systems level.



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Alliance of Bioversity International and CIAT

Via di San Domenico, 1 00153 Rome, Italy

IAES@cgiar.org

<https://iaes.cgiar.org/>