



CGIAR Research Initiative on **Accelerated Breeding**

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Table of contents

CGIAR Technical Reporting 2023

Section 1: **Fact sheet and budget**

Section 2: **Progress on science and towards End of Initiative outcomes**

Section 3: **Work Package progress**

Section 4: **Key results**

Section 5: **Partnerships**

Section 6: **CGIAR Portfolio linkages**

Section 7: **Adaptive management**

Section 8: **Key result story**

1

2

4

9

16

20

22

23

24

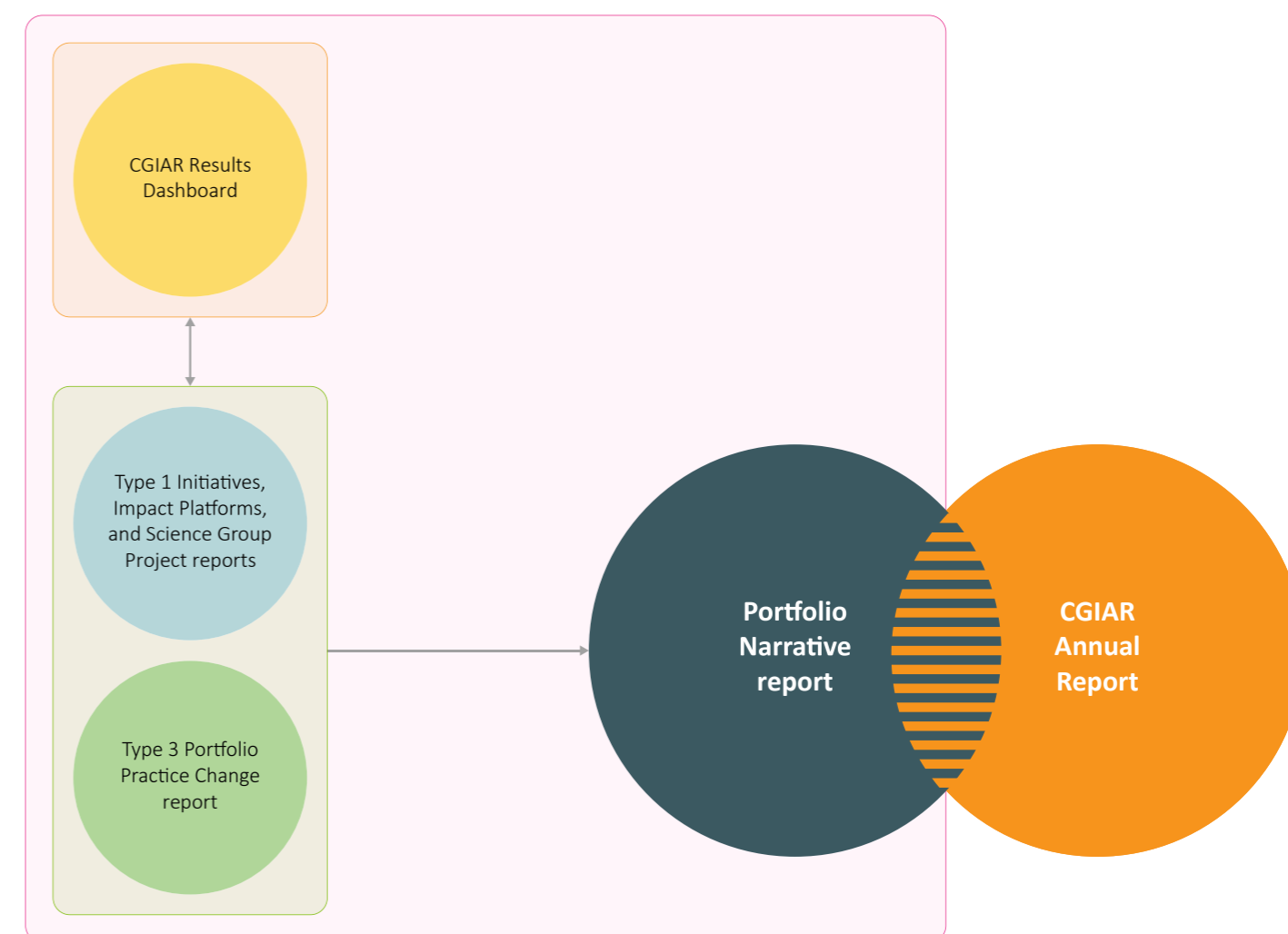
CGIAR Technical Reporting 2023

CGIAR Technical Reporting has been developed in alignment with the [CGIAR Technical Reporting Arrangement](#). This Initiative report (“Type 1” report) constitutes part of the broader [CGIAR Technical Report](#). Each CGIAR Research Initiative submits an annual “Type 1” report, which provides assurance on Initiative-level progress towards End of Initiative outcomes.

The [CGIAR Technical Report](#) comprises:

- Type 1 Initiative, Impact Platform, and Science Group Project (SGP) reports, with quality assured results reported by Initiatives, Platforms and SGPs available on the CGIAR Results Dashboard.
- The Type 3 Portfolio Performance and Project Coordination Practice Change report, which focuses on internal practice change.
- The Portfolio Narrative, which draws on the Type 1 and Type 3 reports, and the CGIAR Results Dashboard, to provide a broader view on Portfolio coherence, including results, partnerships, country and regional engagement, and synergies among the Portfolio’s constituent parts.

The CGIAR Annual Report is a comprehensive overview of CGIAR’s collective achievements, impact and strategic outlook, which draws significantly from the Technical Report products above. For 2023, the Annual Report and Technical Report will be presented online as an integrated product.



Section 1: Fact sheet and budget

Initiative name	Accelerated Breeding
Initiative short name	Accelerated Breeding
Initiative Lead	Michael Quinn (m.quinn@cgiar.org)
Science Group	Genetic Innovation
Start – end date	01/01/2022 – 31/12/2024
Geographic scope	<p>Regions Central and West Asia and North Africa · East and Southern Africa · Latin America and the Caribbean · South Asia · Southeast Asia and the Pacific · West and Central Africa</p> <p>Countries Afghanistan · Algeria · Angola · Argentina · Azerbaijan · Bangladesh · Benin · Bolivia (Plurinational State of) · Brazil · Burkina Faso · Burundi · Cambodia · Cameroon · Central African Republic · Chad · Chile · China · Colombia · Congo · Costa Rica · Cuba · Côte d'Ivoire · Democratic Republic of the Congo · Dominican Republic · Ecuador · Egypt · El Salvador · Eritrea · Ethiopia · Gambia · Ghana · Guatemala · Guinea · Guinea-Bissau · Guyana · Haiti · Honduras · India · Indonesia · Iran (Islamic Republic of) · Iraq · Jordan · Kazakhstan · Kenya · Kyrgyzstan · Lao People's Democratic Republic · Lebanon · Liberia · Libya · Madagascar · Malawi · Mali · Mauritania · Mexico · Morocco · Mozambique · Myanmar · Nepal · Nicaragua · Niger · Nigeria · Pakistan · Panama · Paraguay · Peru · Philippines · Rwanda · Saudi Arabia · Senegal · Sierra Leone · Somalia · South Africa · South Sudan · State of Palestine · Syrian Arab Republic · Tajikistan · Tanzania, United Republic · Thailand · Sudan · Viet Nam · Togo · Tunisia · Türkiye · Uganda · Uruguay · Uzbekistan · Venezuela (Bolivarian Republic of) · Yemen · Zambia · Zimbabwe</p>
OECD DAC Climate marker adaptation score¹	Score 2: Principal The activity is principally about meeting any of the three CGIAR climate-related strategy objectives – namely, climate mitigation, climate adaptation and climate policy, and would not have been undertaken without this objective.
OECD DAC Climate marker mitigation score¹	Score 1: Significant The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives – namely, climate mitigation, climate adaptation and climate policy, even though it is not the principal focus of the activity.
OECD DAC Gender equity marker score²	Score 1A: Gender accommodative/aware Gender accommodative/aware: Gender equality is an objective, but not the main one. The Initiative/project includes at least two explicit gender-specific outputs and (adequate) funding and resources are available. Data and indicators are disaggregated by gender and analyzed to explain potential gender variations and inequalities.
Website link	https://www.cgiar.org/initiative/accelerated-breeding/

¹ The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC [Rio Markers for Climate](#) and the [gender equality policy marker](#). For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.

² The CGIAR Gender Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.

These scores are derived from [Initiative proposals](#), and refer to the score given to the Initiative overall based on their proposal.

EXECUTIVE SUMMARY

The CGIAR Research Initiative on Accelerated Breeding community leveraged the momentum developed through 2022, and from the [Excellence in Breeding CGIAR Research Program](#) before then, to drive towards more impactful breeding approaches, through greater focus, stronger partnerships, and vanguard breeding methods. To assess areas of strength and opportunities for further improvement objectively across crops, Centers and regions, the Accelerated Breeding community developed a shortlist of 26 breeding performance indicators in alignment with the harmonized stage-plan of breeding developed in 2022.

The development of a [Breeding Portal](#) during 2023, populated with data from all Centers and crops, created a “single source of truth” – documenting and describing the full portfolio of CGIAR breeding pipelines, the Target Product Profiles (TPPs) they set out to develop, and the market segments they serve. The Breeding Portal enables real-time updating of the CGIAR breeding portfolio and regular review of breeding priorities, across Centers and crops. The information is displayed publicly through the [Global Market Intelligence Platform \(GloMIP\)](#), developed by the [CGIAR Research Initiative on Market Intelligence](#), thereby providing a greater level of transparency of the breeding activities being executed, and the traits, geographies and benefits being targeted.

CGIAR breeding has always been conducted in close collaboration with national partners. Opportunities exist for CGIAR to support greater involvement of NARES in the development of regionally important varieties, and 2023 saw important steps taken to strengthen these partnerships. Across Western, Central, Eastern and Southern Africa, CGIAR and NARES breeding teams held 52 national consultation meetings, or “Product Design Team (PDTs) meetings” to systematically align regional breeding targets with the prioritized needs of farmers, consumers, seed companies and processors. The consultations used a standardized methodology and covered 12 crops across 18 countries. In parallel, breeding activities, comparative strengths, and opportunities between respective CGIAR and NARES breeding teams were analyzed for 69 national crop country programs by the end of 2023. They form a solid basis for regional breeding strategies to best leverage network member capacities. Accelerated Breeding took the lead in holding the [second Genetic Innovation NARES Leadership consultation meeting](#), an annual and formal mechanism for consulting with research leaders in NARES, sub-regional organizations (SROs) and other development partners. The high-level meeting captured feedback and ensures that steps taken, and plans made, are in alignment with partners’ expectations and change ambitions.

The breeding pipelines developing impactful varieties for low-income farmers were augmented to implement a wide range of optimization measures to increase the rate of genetic gain delivered. The results contributed to a framework for Trait Discovery and Deployment (TD&D) strategy optimization based on assessing return on investment; shorter breeding cycle times; improved data accuracy; more precise estimation of breeding value contributing to more discerning parental selections and the next generation of breeding materials; and greater alignment between breeders’ selections of parents and of candidate varieties with performance on farm and the drivers of adoption by farmers.

The combined efforts resulted in partners successfully registering 165 varieties with greater climate-resilience; and 50 varieties with traits directed to lower malnutrition among women and children. Maize created powerful evidence for farmers gaining access to stress-tolerant, nutritious maize hybrids and varieties at a large scale, and its CGIAR-NARES-private sector partnership creating annual economic benefits well above USD 1 billion.

	2022	2023	2024
PROPOSAL BUDGET ▶	\$33.69M	\$36.22M	\$39.09M
APPROVED BUDGET ¹ ▶	\$26.78M	\$27.72M ²	\$24.43M ³

¹ The approved budget amounts correspond to the figures available for public access through the [Financing dashboard](#).

² This amount includes carry-over and commitments.

³ This amount is an estimation of the 2024 annual budget allocation, as of the end of March 2024.

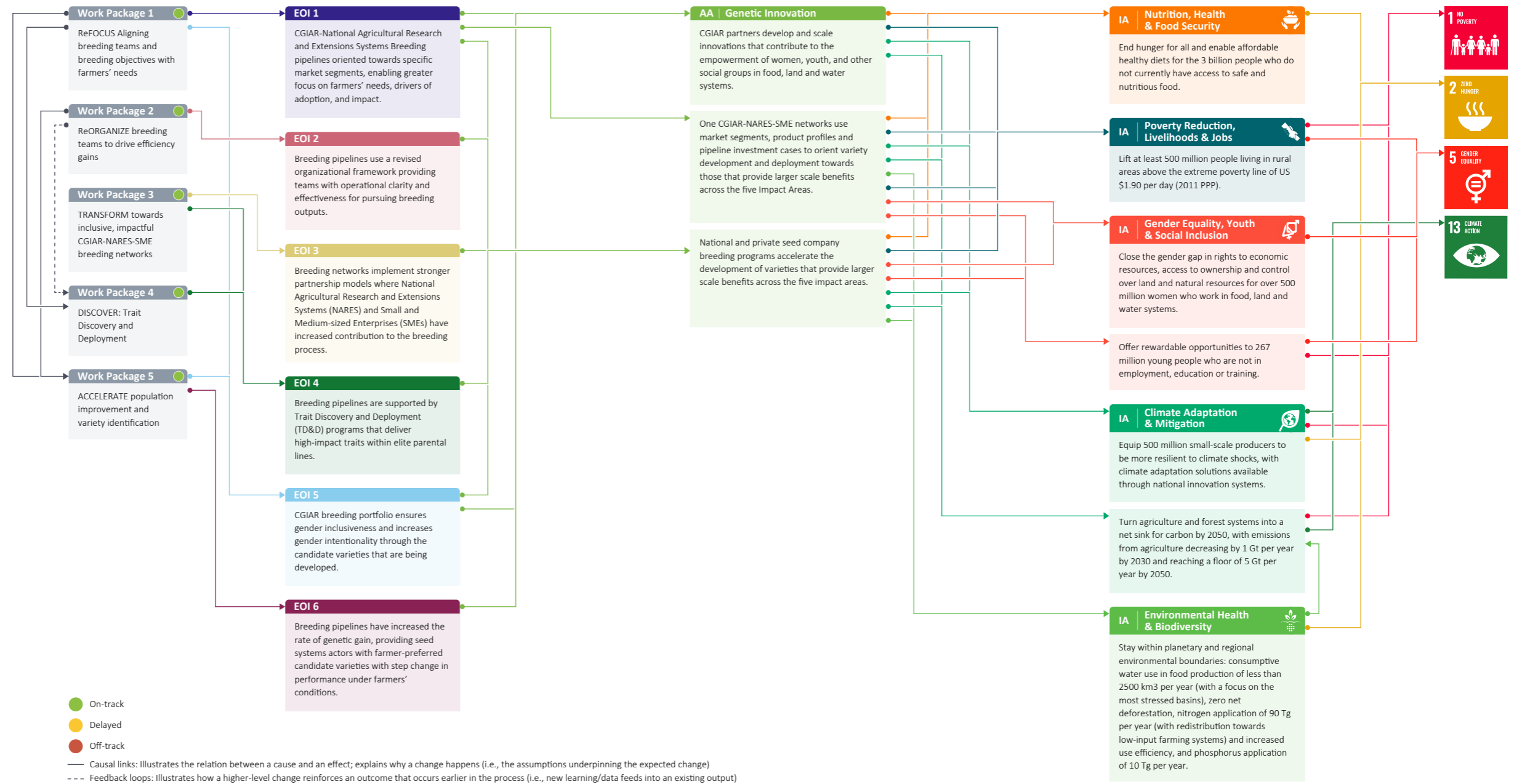


Digital data collection in rice breeding field trial in the Philippines. Credit: IRRI, 2019

Section 2: Progress on science and towards End of Initiative outcomes

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives' theories of change are excluded for clarity.



EOI | End of Initiative outcome
 AA | Action Area
 IA | Impact Area
 SDG | Sustainable Development Goal

Note: A summary of Work Package progress ratings is provided in Section 3.



Potato farmer in the Andres, potato birthplace, where native potato farmers cultivate more than 4,000 varieties.
Credit: Stef de Haan / CIP, 2018

EOIO 2: Breeding pipelines use a revised organizational framework providing teams with operational clarity and effectiveness for pursuing breeding outputs.

Capitalizing on the One CGIAR transformation, and building upon the 2022 stage plan formulation, harmonized understanding of the breeding process model was extended to begin to encompass [market intelligence and seed system domains](#). The approach establishes a harmonized process flow and enables clear articulation and understanding of the function of stages and teams working within those stages along the product lifecycle. A [common articulation](#) of processes, outputs, customers and “owners” of stages and key stage gates defines the flow of products and information along the germplasm life cycle. This development entails a significant step change for aligning CGIAR breeding processes in a consistent manner because it facilitates greater operational clarity and transparency around the form and function of breeding stages, key stage gates, and the role, contribution, and performance of associated research teams towards targeted outcomes.

CGIAR breeding teams also developed and agreed on 26 [indicators of breeding process performance](#). They comprise executive level and key management level indicators that capture performance measures and improvement needs. They include elements that drive genetic gains. From these indicators context specific key performance indicators (KPIs) will be developed, providing greater clarity regarding “what good looks like”. The results move CGIAR breeding towards harmonized and informative metric-driven learning and further incentivizes implementation of strategic process improvement and breeding modernization.

EOIO 3: Breeding networks implement stronger partnership models where NARES and SMEs have increased contribution to the breeding process.

Methodology was developed and scaled to ensure a client-driven process to regional breeding priority setting. The process, known as “Product Design Team (PDT) Meetings”, captures national level insights into the varieties that are most in demand by farmers, will be most impactful, and align with national priorities. Between 2022 and 2023, scaling of this innovation has captured insights from cross-disciplinary teams for over 80 crop-by-country combinations. As a result, substantial revisions are being made to TPPs to better align with the needs of farmers, countries, value chains and consumers. The approach operationalized an explicit, data-evidenced alignment of breeding priorities among partners which is a fundamental basis for stronger partnership models.



Wheat, maize and triticale field trials at CIMMYT experimental station in Toluca, Mexico.
Credit: Alfonso Cortés / CIMMYT, 2020

[Better alignment of the comparative advantages](#) between CGIAR and NARES arose from the [first Senior Leadership Consultation Meeting of CGIAR-NARES breeding networks in 2022](#) and was captured in the [Aide Memoire](#) from that meeting. Standardized and scalable methodology has since been developed and applied in 2023 for peer/self-assessment of partners’ levels of breeding activity, strengths, opportunities, and ambitions. These assessments have provided the necessary baseline information to augment the roles of partners within breeding networks. As a result, many NARES breeding programs (at least 52 just in Sub-Saharan Africa) contribute much more strongly to regional breeding processes through active participation in priority setting and assuming greater breeding responsibilities.

Many NARES partners want to take a more significant role in germplasm development. Without funds to develop greater breeding capacity, the situation would not change and so an innovative solution was developed. Specifically, plans have been developed, using five crops (beans, cassava, matooke, maize and sweet potato) at the National Agricultural Research Organisation (NARO) of Uganda as a pilot, to co-fund NARES breeding teams to bolster their breeding efforts toward development of germplasm for the region. These bolstered breeding efforts will fully embrace Accelerated Breeding-promoted approaches to modernize breeding. NARES partners will gain further hands-on experience in running a modern breeding program in a way that they previously were not able to for a range of reasons, including a lack of operational resources. The outcome of this approach is that these NARES will grow their breeding capacity while having greater involvement in the development of germplasm for their region as part of vibrant NARES-CGIAR breeding networks.

EOIO 4: Breeding pipelines are supported by Traits Discovery and Deployment programs that deliver high-impact traits within elite parental lines.

A standardized method for evaluating the value [of traits](#) targeted by CGIAR Trait Discovery and Deployment (TD&D) pipelines was developed in 2023. This method brings together the experience and expertise of geneticists together with knowledge and understanding from the Market Intelligence Initiative to frame potential returns from TD&D opportunities in a data-driven manner. This enables a more objective prioritization of TD&D activities, greater alignment with impact, and greater transparency. This novel, pragmatic and transdisciplinary approach allows to leverage broader implementor and stakeholder expertise through diverse data and the interoperability of systems – the Breeding Portal and GloMIP in particular – to identify the highest value TD&D investments from a farmer-centric perspective.

In addition to trait valuation, a decision tree framework for TD&D strategy optimization has been developed. The framework and resulting tool will enable researchers to evaluate and define optimal TD&D strategies, leveraging broader community knowledge, and to document and re-evaluate their approaches. These advances comprise important milestones to both prioritize activities and to define optimal approaches to deliver high-impact traits through breeding pipelines to farmers.

Summary of progress against the theory of change

Accelerated Breeding has developed and implemented a number of important innovations and outputs supporting breeding and modernization of breeding in 2023 against the theory of change. Some of these important innovations are described below in the context of the End of Initiative outcome (EOIO) they contribute to. Scientific progress is also documented in the 163 journal articles published in 2023 that describe research aligned with the Accelerated Breeding theory of change.

Progress by End of Initiative Outcome

EOIO 1: CGIAR-NARES breeding pipelines oriented towards specific market segments, enabling greater focus on farmers’ needs, drivers of adoption, and impact.

Before 2022, breeders may have documented product profiles and target geographies off-line or had them “in their mind”. Between 2022 and 2023, the portfolio of CGIAR breeding pipelines, the Target Product Profiles (TPPs) they set out to develop, the market segments they serve, and the level of breeding effort dedicated to develop each TPP, have been documented in a standardized manner in a quality-assessed online database, the [Breeding Portal](#). The Breeding Portal is fully linked with GloMIP (developed by the Market Intelligence Initiative), displaying the same market segment data as GloMIP. Together with the Market Intelligence Initiative, a process has been developed for multi-disciplinary teams to systematically review and revise TPPs to ensure they all are impactful, in-demand, and technically feasible to develop. These efforts systematically involve breeding network partners.

Prioritization of investment into breeding pipelines is supported by the information captured in the Breeding Portal and GloMIP. It is now possible to identify and aggregate resources towards the most impactful breeding pipelines and market segments. While such assessments are so far based on online area estimates, and offline estimates of poverty and malnutrition, the Market Intelligence Initiative is developing online capability using a wide range of development indicators.

These efforts have focused CGIAR breeding pipelines, aligned CGIAR and NARES breeding efforts, enabled innovative approaches for assessing the CGIAR breeding portfolio for prioritization purposes, and provided direction for CGIAR trait discovery research efforts to develop products that are in demand by farmers in the most impactful market segments.

EOIO 5: CGIAR breeding portfolio ensures gender inclusiveness and increases gender intentionality through the candidate varieties that are being developed.

Significant progress is being made on mainstreaming gender inclusiveness and increasing the gender intentionality of the portfolio. CGIAR-NARES Product Design Teams (PDTs), established in 2022 and 2023, systematically include men and women representatives from a wide range of stakeholders, and draw on gender insights developed by studies by the Market Intelligence Initiative. During 2023, 53 percent of breeding programs collected gender-disaggregated data from on-farm verification trials; and 50 varieties registered were improved to reduce malnutrition in women and children. Drawing on combined TPP information, Accelerated Breeding was able to cluster individual crop trait priorities into fourteen distinct [value propositions](#). They are being used by the Market Intelligence Initiative for benefit projection modeling and are expected to also systematize gender-differentiated benefit estimates.

EOIO 6: Breeding pipelines have increased the rate of genetic gain, providing seed systems actors with farmer-preferred candidate varieties with step change in performance under farmers' conditions.

Accelerated Breeding provides an annual update on genetic gains by crop across CGIAR breeding pipelines, using [standardized methods](#). Underlying data and methods are progressively being improved. In 2023, genetic gains estimates were carried out by market segment for the first time, and the number of pipelines included increased. More programs and pipelines produced reliable genetic gains assessment, due to an increased number of environments and stages covered, better designs, and improved data quality. In 2023, realized genetic gain for yield was reported for 13 crops across Centers and was positive for 87 percent of pipelines.

All breeding programs took steps to further optimize their breeding schemes and [accelerate genetic gains](#). Progress was made in aligning breeding efforts with market segments; improving parent selection and crossing, selection strategies; germplasm sharing strategies; improving testing strategies at Early, Late and On-farm Verification stages, and aligning them with TPPs.

Draft archetypes of an optimized breeding scheme for different crop types were developed based on quantitative genetics theory, [simulations](#), empirical evidence across multiple crops, and the experiences of expert plant breeders. They will act as an invaluable blueprint for CGIAR and NARES breeding teams as they make changes to their breeding schemes to increase the rate of genetic gain.

An important innovation implemented in 2023 was Early Testing that is both more expansive [and more representative](#) of performance under farmer-managed conditions. This results in higher rates of genetic gain through earlier recycling of parents and from more accurate selection of parents that are high performing for traits most valued by farmers. Together with financial and intellectual support from a [Bill & Melinda Gates Foundation](#) (BMGF) bilateral grant, maize and bean pipelines have begun to leverage the power of genomics and advanced statistical designs and analyses to sample between 300 and 600 individual environments. The pilot will continue in 2024 and plans for scaling to other crops and pipelines will be made based on insights gained.

[On-Farm-Verification](#) was successfully implemented by several crops with plans to scale further in 2024, through bilateral projects. On-Farm-Verification will result in variety releases that are better aligned with drivers of variety adoption, better informed selections throughout the breeding process, and improved understanding of the relevance and representativeness of breeding pipelines' early and late-stage testing.

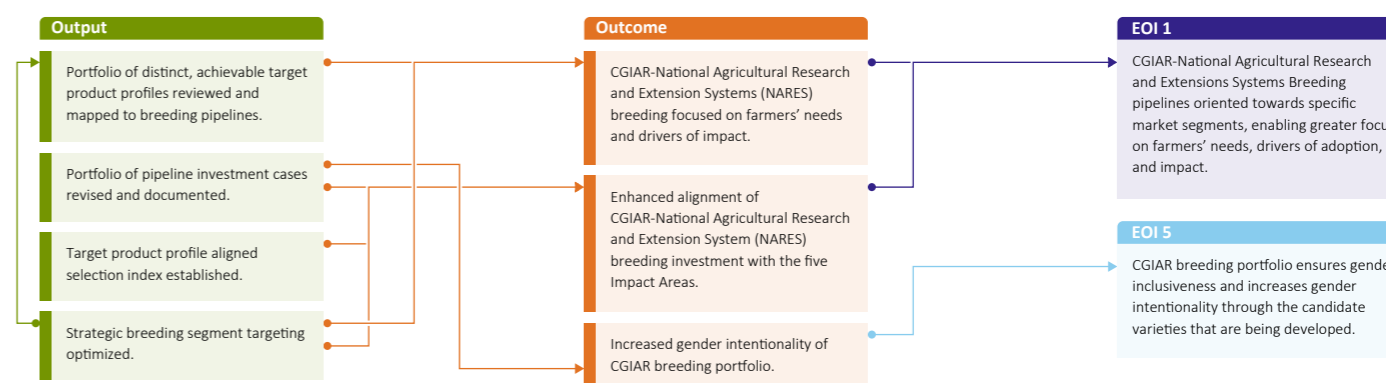
Breeding teams developing improved varieties, the acceleration of genetic gains, and the modernization of CGIAR-NARES breeding are made possible by numerous funding sources. During 2023, the [Program Management Platform](#) (PMP) was developed as an innovative tool to unleash the power of alignment between multiple projects which are often addressing different components of a higher-level goal. The PMP enables cross-project/Initiative learning, reduces transaction costs, and enables the success of individual scientists and breeding teams including by supporting their focus on the most promising improvement opportunities.

Through these and a wide range of other innovations, CGIAR-NARES collaborative breeding approaches make available a wide range of increasingly impactful varieties. During 2023, seed systems actors registered [198 varieties](#) – among them, 165 varieties with climate-resilience and 50 with greater nutritional value. Seventy-nine percent were registered in low and lower-middle income economies where more than 93 percent of all people live with incomes below USD \$2.15 a day.

Section 3: Work Package progress

WP1: ReFOCUS

● On track



Work Package 1 progress against the theory of change

During 2023, the Breeding Portal was conceptualized, developed, and linked with the GloMIP and other CGIAR platforms, as an authoritative quality-assessed platform that captures CGIAR breeding strategies. ReFOCUS uploaded the combined crop market segment, TPP and breeding pipeline data, and reviewed it for accuracy. Having a tool that can be used by teams across the globe, and a common set of terms across all CGIAR crops simplified the effort, made interactions easier, and enabled productive discussions with breeding teams. Breeding Portal tools enabled a review of each CGIAR crop breeding program and allowed breeding programs to make the focus of their efforts transparent. Currently there are 563 sub-regional crop market segments, 300 TPPs and 122 breeding pipelines in the Breeding Portal for 17 crops. Data can routinely be updated and are made public through GloMIP. Data for dryland crops will be entered in early 2024. A tier of breeding effort was assigned to each market segment. They describe the stages of product development that

occur for each market segment, and how breeding efforts are being leveraged across market segments.

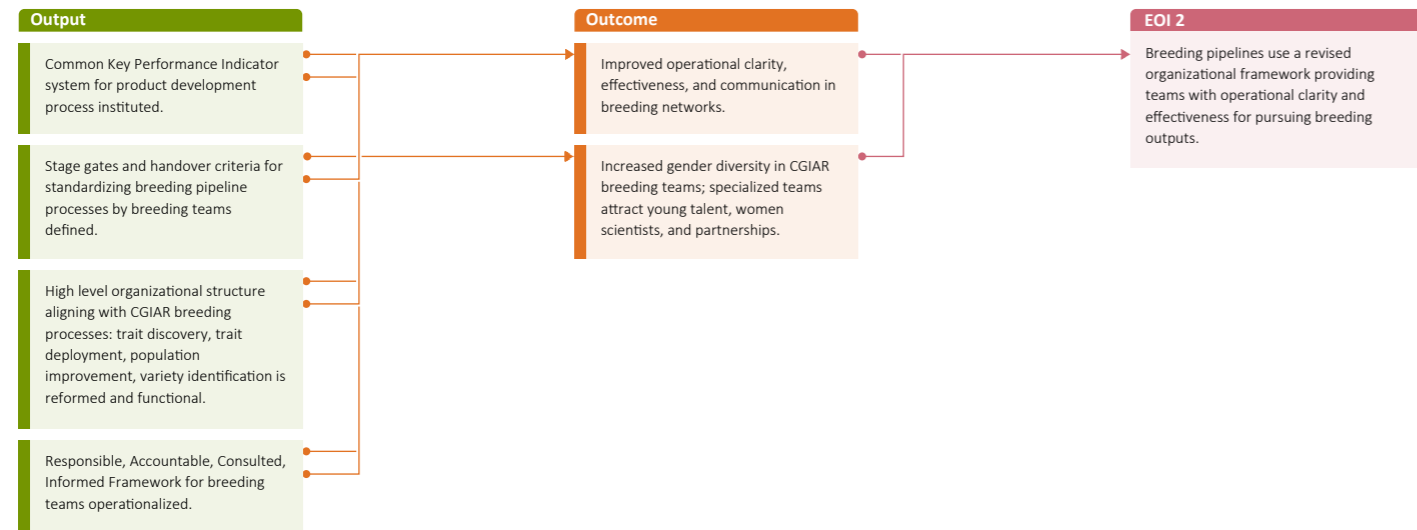
The capture and review of the focus of each breeding program ensure that (i) the germplasm improvement and variety identification are systematically aligned with the appropriate TPP and (ii) that breeding ambitions and timelines are realistic. During 2023, NARES information on market segments, TPPs and breeding pipelines was collected by TRANSFORM and used to validate and update the sub-regional market segment data provided by CGIAR breeding teams. ReFOCUS results are an important basis for CGIAR-NARES breeding networks to systematically (i) incorporate new market intelligence, (ii) increase effectiveness and likeness of success, (iii) increase gender intentionality, (iv) increase alignment among network partners, and (v) ensure breeding pipelines are focused on farmers' needs, drivers of adoption and impact.



Harvesting WEMA maize trials at KALRO Kiboko Research Station, Makueni, Kenya. Credit: Peter Lowe / CIMMYT, 2018

WP2: ReORGANISE

On track



Work Package 2 progress against the theory of change

ReORGANIZE made good progress in 2023 delivering outputs underpinning Accelerated Breeding's EOIOs. The team developed and delivered Suppliers, Inputs, Process, Outputs, Customers (SIPOC) with information for each breeding stage to promote greater clarity and transparency around the form and function of breeding stages and key stage gates. In collaboration with the [CGIAR Research Initiative on Seed Equal](#), the SIPOC was extended into the seed system space using common language and framing. This unified model and associated knowledge and understanding is fundamental to detailing the key outputs and key clients for the various breeding and seed system stages, aligned with the process model established in 2022. Clear definitions of outputs and customers is required to frame organization, and roles and performance expectations to teams aligned with outcome goals.

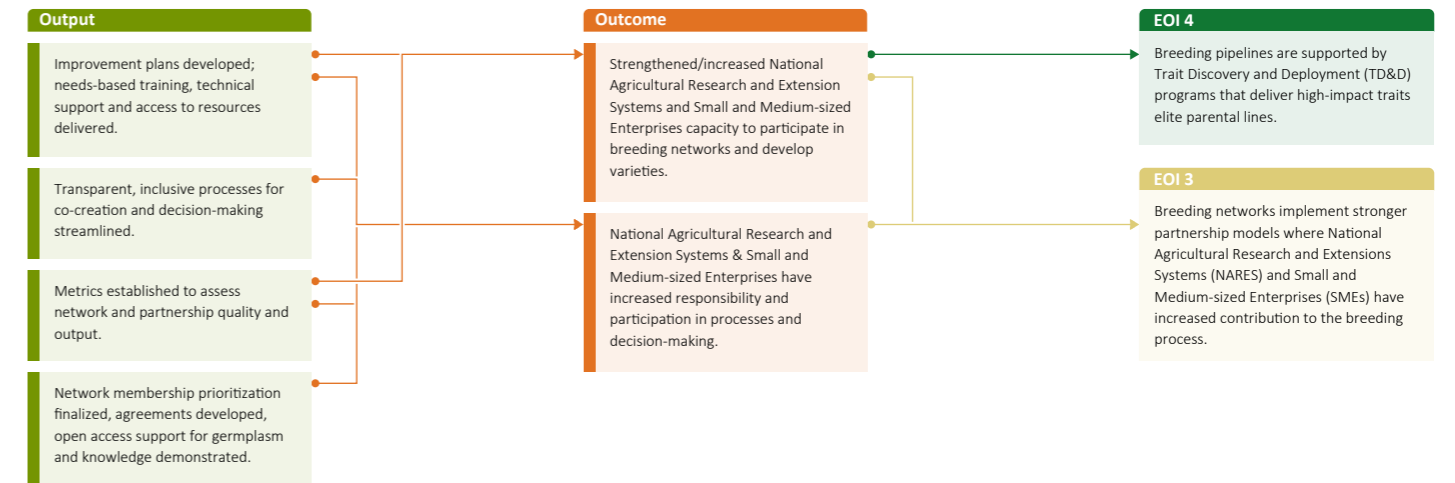
Common high-level skills were identified across breeding programs as a requisite for a skills-centric definition of a RACI (Responsible,

Accountable, Consulted, and Informed) model for research teams that provides team members with clarity and motivation. The skills set draft moves breeding teams closer to both identifying current and desired skill sets considering breeding pipeline sizes and breeding targets and closer to defining the roles, responsibilities and accountabilities that each skill set has at each stage. The cross-Center initiative also identified a list of 26 indicators, derived from a larger list of over 60 crop-or Center-specific indicators, from which context specific KPIs will be developed to underpin effective and transparent monitoring, evaluation and learning within breeding programs.

Continuous and agile improvements in breeding require measurement of the right thing and are based on the philosophy that "what gets measured gets done; what gets measured and fed back gets done well; and what gets rewarded gets repeated." The definition of the primary indicator list enables breeding teams to move towards harmonized- and informative metrics-driven learning.

WP3: TRANSFORM

On track



Work Package 3 progress against the theory of change

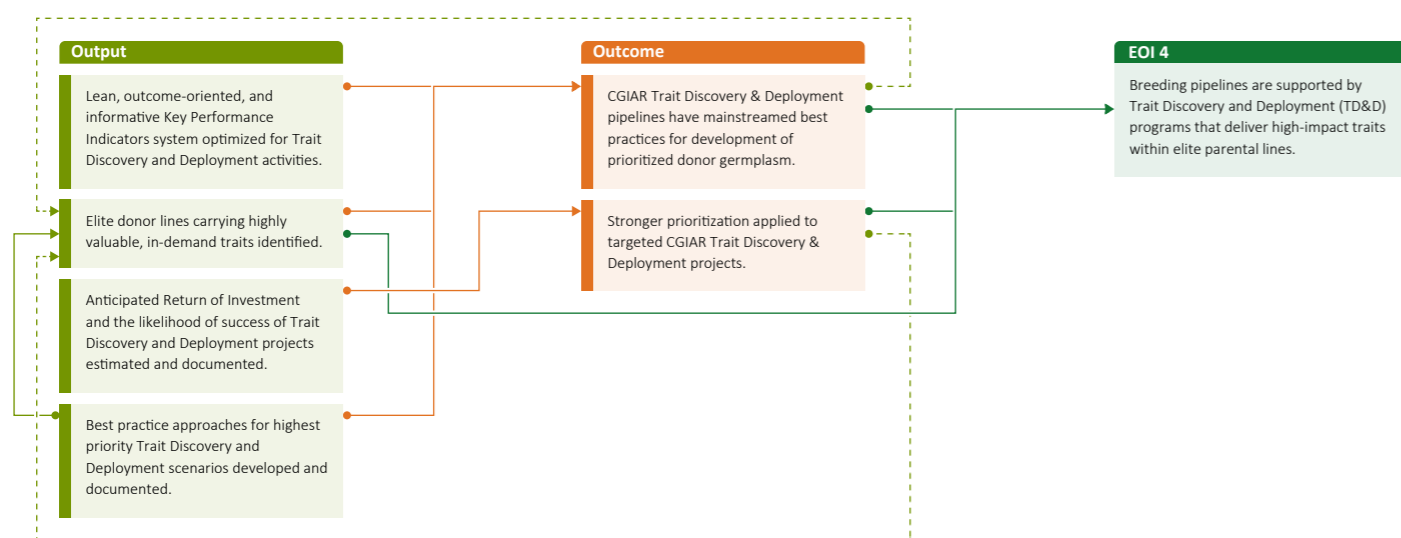
TRANSFORM is making significant progress against the theory of change, in large part due to the scaling of innovations introduced in 2022. Stronger partnership models are being developed within 55 crop-by-region breeding networks, based on common tools and processes. Historically grown partnership models are being reassessed, and transparency on partner inclusion created. A clear process to define and aggregate national priorities to the sub-regional and regional level ensures bottom-up, stakeholder-driven priority setting, and alignment among network partners. It is being deployed at scale and further refined in Africa, covering in 2023 12 crops across 18 countries. Insights gained lead to updated regional market segments and TPPs for breeding networks, and influence the priority setting of CGIAR's research programs.

Systematic and objective peer-based assessments of partner capacities are resulting in a clear process to identify partners that can

assume greater roles in regional breeding networks with the greatest likelihood of success. Since 2019, 69 such assessments have been conducted in Africa and South Asia. In some networks, this process is already resulting in greater operational investment in network partners to assume increased breeding roles. Similar to their peers at CGIAR Centers, partners have developed prioritized improvement plans and can access the modernization know-how within the [Genetic Innovation](#) Science Group. Dialogue with NARES, sub-regional organizations (SROs) and development partner leadership is ongoing through the annual GI-NARES leadership forum that gathers leaders from CGIAR's Genetic Innovation Science Group and partners in a physical meeting to take stock of current collaboration and identify areas for further improvement. Outcomes from these meetings are documented in public Aide Memoires and have guided the work of TRANSFORM to further strengthen partnerships in response to concerns and suggestions raised by partner leadership.

WP4: DISCOVER

On track



Work Package 4 progress against the theory of change

The portfolio of TD&D [efforts](#) across commodities targeted within CGIAR breeding projects was updated, providing a refreshed understanding of portfolio scope, breadth and focus. A total of 325 distinct TD&D activities were detailed, targeting either global breeding or specific market segments. This activity portfolio was condensed to 166 unique Center-crop-trait(s) combinations, focusing on biotic stresses (41 percent), nutritional, production and end-use traits (30 percent), abiotic stress tolerance (22 percent) and yield per se (10 percent).

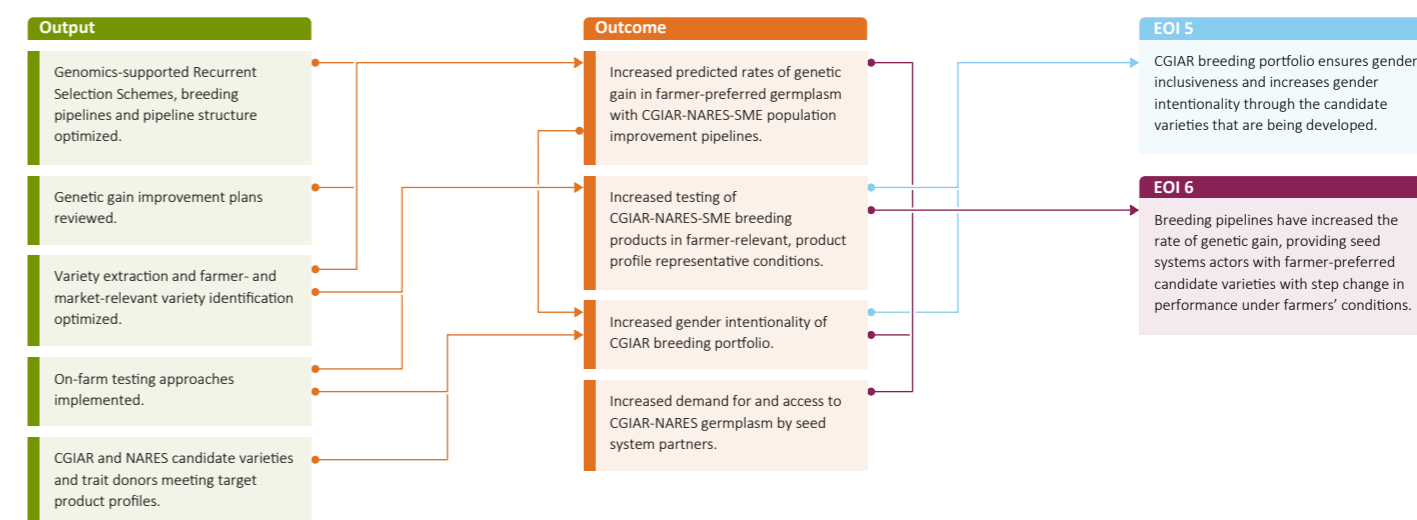
Building upon the portfolio captured in 2022, a pilot pipeline was developed for trait valuation. This was achieved utilizing expert estimations of the contribution of the trait to yield if successfully deployed in a variety and grown by farmers. This first-of-its-kind pipeline leverages transdisciplinary knowledge from genetics and market analysis to explore the potential impacts of TD&D efforts if translated through breeding and seed systems. Using the TD&D portfolio from DISCOVER, together with the Breeding Portal, which

leverages information from ReFOCUS and GloMIP, the pipeline provides a dynamic interface through which trait opportunities can be explored with all assumptions and rationales being documented in a transparent manner. Extending and further formalizing this pipeline will be a focus in 2024.

Working towards optimal practice definition, detailed focus discussions were held with a majority of the TD&D teams within CGIAR. Understanding from these discussions, coupled with inputs from quantitative geneticists in ACCELERATE, has culminated in a draft for a decision tree structure to help guide TD&D practitioners through a range of decisions to define one or more optimal approaches to implementing project activities. The multiplicity of optimal pathways is a multifaceted concept which requires scientists to balance biological knowledge with other demands. The decision framework provides scientifically valid and relevant options which can be further interrogated considering resource use, delivery demand and other factors.

WP5: ACCELERATE

On track



Work Package 5 progress against the theory of change

Supported by ACCELERATE, CGIAR breeding programs continued with breeding program optimization. Significant progress was made in improving parental selection, reducing breeding cycle length using rapid cycle genomic selection (45 percent of programs), [understanding pipeline structure](#) and developing plans to share germplasm across related pipelines or from TD&D pipelines (79 percent). Early and late testing strategies were improved to more accurately select for performance in farmers' fields (82 percent). Many programs also leveraged tools and services from the [CGIAR Research Initiative on Breeding Resources](#) to support optimization efforts, including use of data management systems (75 percent), genotyping services (84 percent) and improvement of breeding operations from [Crops to End Hunger](#) investments. Also, there was increased [alignment between breeding efforts and breeding targets](#) with genetic gain estimates being reported by market segment for the first time. This was enabled by centralization of data on market segments and TPPs in the Breeding Portal.

An increasing number of programs mainstreamed product

advancement meetings to ensure that candidate variety matched trait preferences documented by TPPs. Citizen science methods like TRICOT and others were used by about 28 percent of breeding programs in extensive on-farm verification trials. These approaches helped breeding programs to make progress in understanding performance of candidate varieties under farmer-representative conditions, understanding farmer- and end-user preferences, as well as collecting gender disaggregated data that can be used to refine the currently documented TPPs.

Positive and incremental genetic gain was reported by 87 percent of breeding programs. Partners in 36 countries registered 198 varieties derived from CGIAR-NARES breeding pipelines, with high proportions improved for climate resilience (165 varieties) and/or greater nutritional value (50 varieties). Continued cross-learning across crops and programs support continuous improvement of CGIAR-NARES breeding. These efforts will be further facilitated through an innovative Program Management Platform that creates transparency across project plans funded from diverse sources.

WORK PACKAGE	PROGRESS RATING & RATIONALE
1	<p>Progress rating</p> <p>The Breeding Portal was developed and loaded with current market segment, TPPs and breeding pipeline data. Over 90 percent of CGIAR breeders reviewed the current TPPs, and their alignment with breeding pipelines and market segments. Twenty-seven NARES defined country specific TPPs.</p> <p>Evidence links:</p> <ol style="list-style-type: none"> Result 348 - Target Product Profile Information in Breeding Portal 2023. Result 342 - 2023 CGIAR breeders survey - CGIAR Center experiences with implementing faster and more accurate breeding cycles. Result 7658 - CGIAR breeding pipelines are oriented towards specific market segments, enabling greater focus on farmers' needs, drivers of adoption, and impact. Result 348 - Portfolio of distinct, achievable Product Profiles. Result 350 - The breeding portal makes CGIAR breeding strategies transparent.
2	<p>Progress rating</p> <p>The development of the SIPOC and the 26 harmonized and prioritized indicators builds upon the breeding process model defined in 2022, enriching transparent understanding of breeding processes, the form and function and clients of different stages of the breeding process. The indicators enable clear KPI definition in common areas of importance to breeding modernization and the delivery of genetic gains in farmers' fields. The skill set draft provides a benchmark to map skills used, and define skills needed, per breeding stage. Implementation of the breeding process model advanced in several commodities evidenced through end of year surveys.</p> <p>Evidence links:</p> <ol style="list-style-type: none"> Result 9285 - Harmonized indicators to understand and drive breeding modernization. Result 367 - Aligning CGIAR breeding processes to a common organizational structure - SIPOC Product Development Process.
3	<p>Progress rating</p> <p>The activities are on track for Sub-Saharan Africa and South Asia which have been the core focus for the Initiative phase. Spill-over results are seen in other regions: Latin America and the Caribbean, Central and West Asia and Northern Africa, and Southeast Asia, where they are also being adjusted based on diverse partnership dynamics.</p> <p>Evidence links:</p> <ol style="list-style-type: none"> Result 352 - Harmonizing standards for breeding partnerships. Result 1015 - High level engagement for co-creation of collaborative breeding networks.
4	<p>Progress rating</p> <p>An update to the portfolio of activities conducted within TD&D across the vast majority of CGIAR breeding programs was completed. A pilot pipeline for trait valuation was made in collaboration with the Market Intelligence Initiative, bringing unique genetic and market perspectives together in a transparent framework. A draft decision tree structure was defined after wide and in-depth discussion with TD&D teams moving towards agile optimal strategy definition for DISCOVER projects.</p> <p>Evidence links:</p> <ol style="list-style-type: none"> Result 1241 - Novel breeding lines for developing resilient and end-user -demanded crops. Result 372 - Anticipated return on investment of CGIAR upstream breeding investments.

5	<p>Progress rating</p> <p>Work Package outputs are on-track. Most of the concerns and lack of clarity regarding the workplan experienced in 2022 were mitigated in 2023 through dialogue, and further addressed through the development of the Program Management Platform. The Platform enables users to align workplans, including improvement plans, across the multitude of projects funding the Genetic Innovation Science Group.</p> <p>Evidence links:</p> <ol style="list-style-type: none"> Result 342 - 2023 CGIAR breeders survey - CGIAR Center experiences with implementing faster and more accurate breeding cycles. Result 344 - 2023 CGIAR breeders survey - Current CGIAR efforts in developing farmer- and market-relevant variety identification schemes. Result 345 - 2023 CGIAR breeders survey - On-farm evaluation innovations to better represent farmers' conditions and views. Result 340 - From initiative - and project-level management to Science Group management. Result 346 - Genetic gains in crop breeding pipelines improved. Result 350 - The breeding Portal makes CGIAR breeding strategies transparent. Result 3545 - A two-dimensional process-based theory of change conceptualizes R&D intervention. Result 369 - Aligning standardized breeding pipeline processes and stage gates in Genetic Innovation. Result 28 - International wheat breeding networks accelerate genetic gains for climate-resilient, nutritious, market-demanded varieties with durable disease resistance for smallholders in Asia, Africa, and Latin America. Results 30-49,53-62,188,305,302,342,344-346,348 - Identifying and implementing farmer- and market-relevant crop variety identification schemes.
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Definitions

On track

- Annual progress largely aligns with Plan of Results and Budget and Work Package theory of change.
- Can include small deviations/issues/delays/risks that do not jeopardize success of Work Package.

Delayed

- Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas.
- Deviations/issues/delays/risks could jeopardize success of Work Package if not managed appropriately.

Off track

- Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas.
- Deviations/issues/delays/risks do jeopardize success of Work Package.

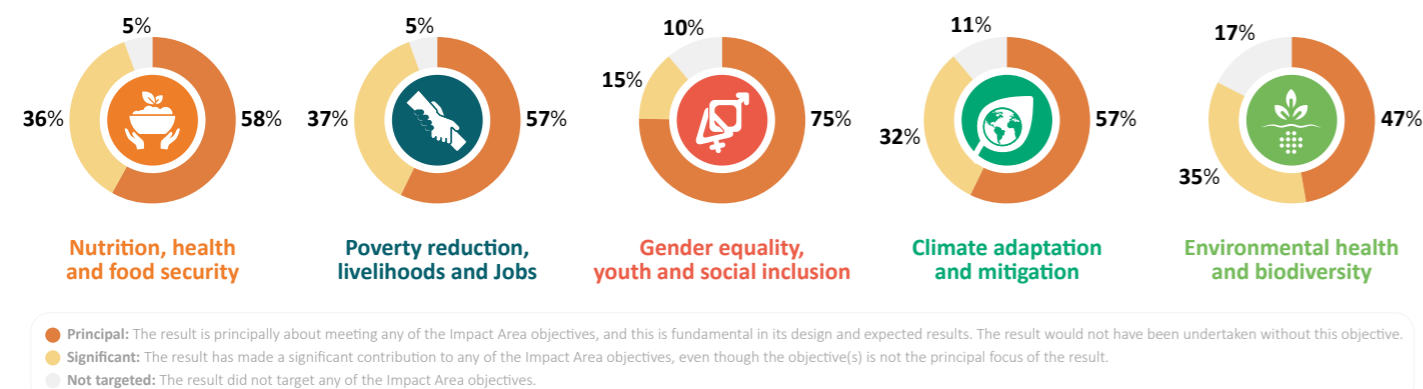
Section 4: Key results

This section provides an overview of results reported by the CGIAR Research Initiative on Accelerated Breeding in 2023. These results align with the CGIAR Results Framework and Accelerated Breeding's theory of change. Source: Data extracted from the [CGIAR Results Dashboard](#) on 29 March 2024.

NUMBER OF INNOVATIONS BY READINESS LEVEL

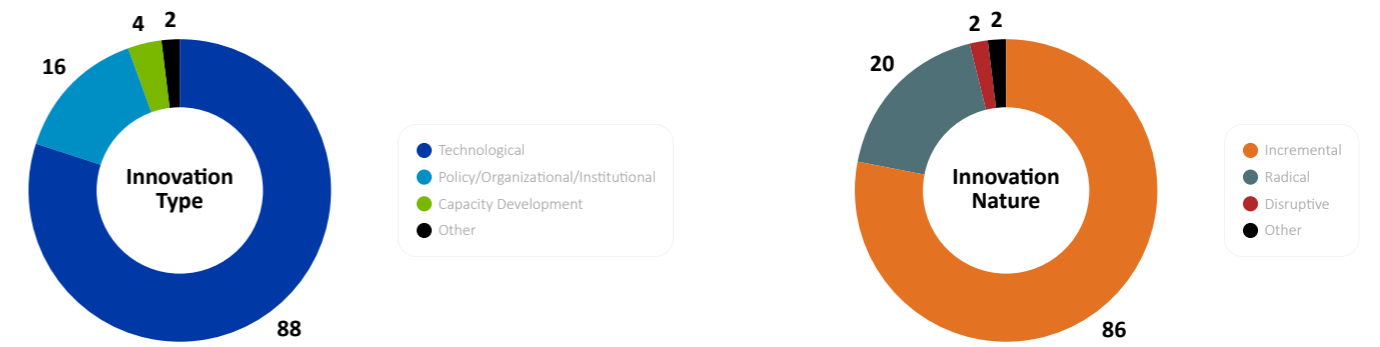


PERCENTAGE OF REPORTED RESULTS TAGGED TO CGIAR IMPACT AREAS

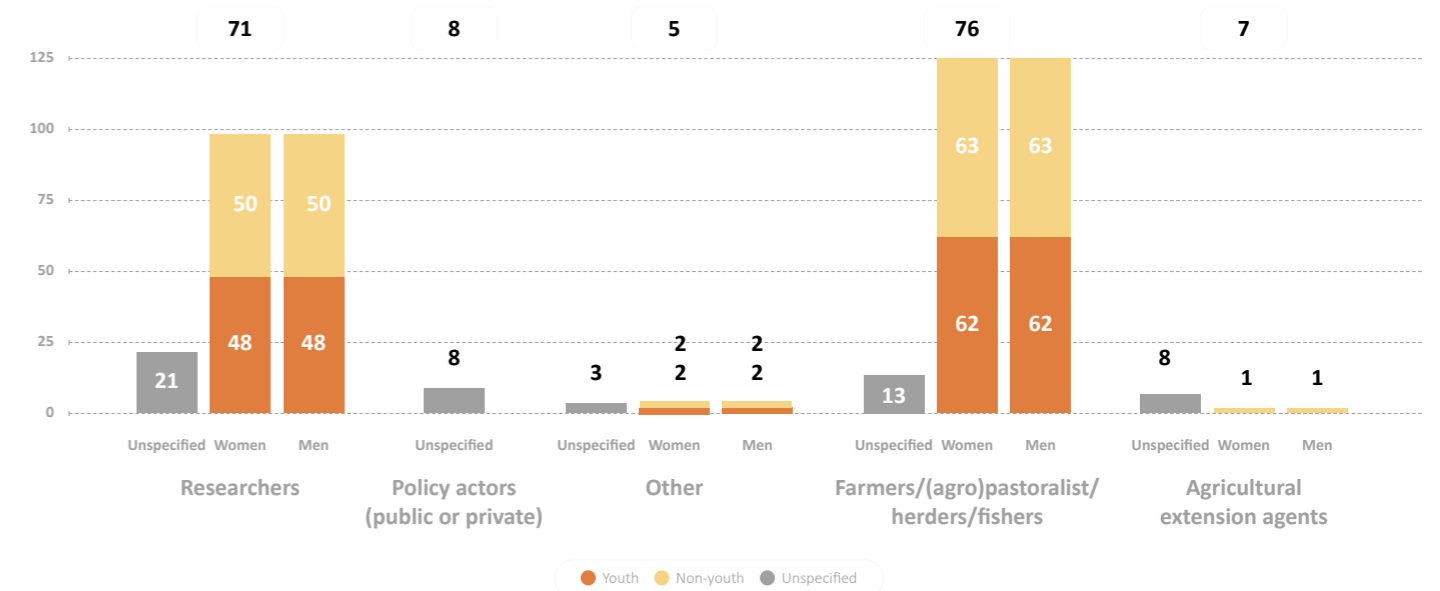


This figure present the Impact Area tags for each of the 110 innovations reported in 2023.

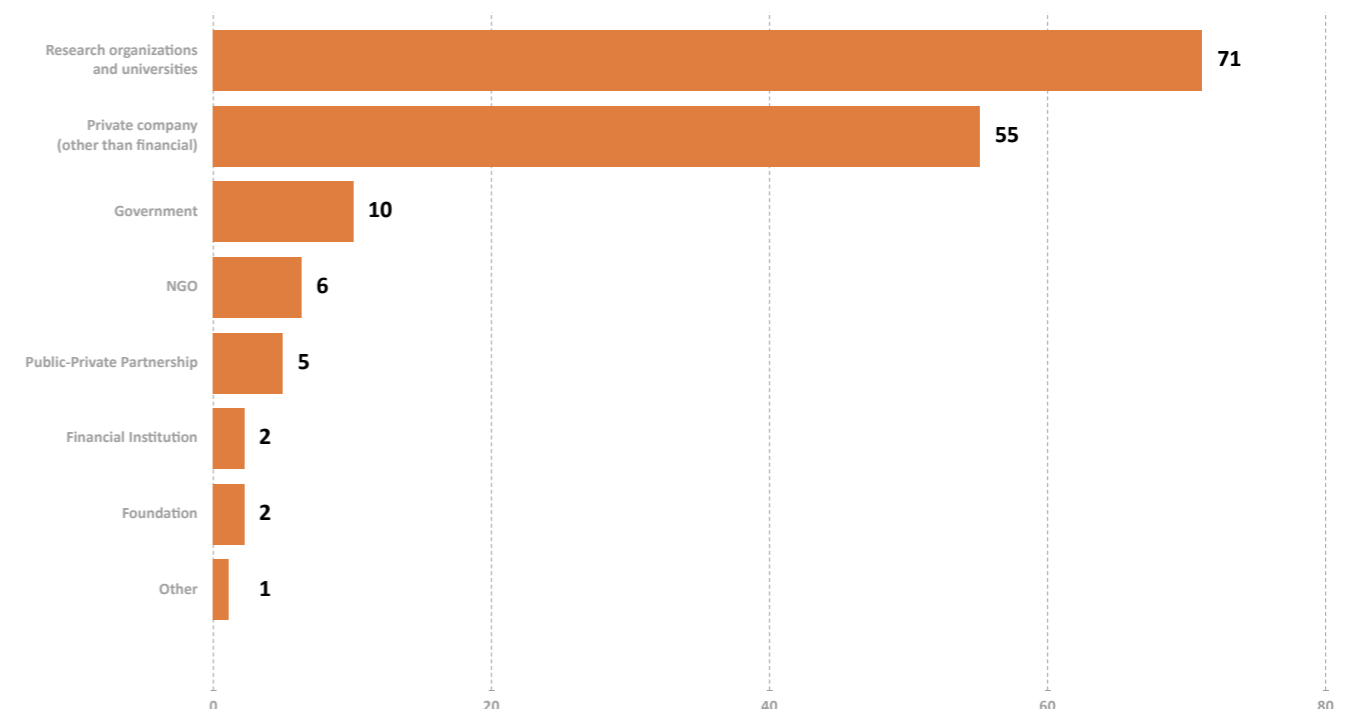
NUMBER OF REPORTED INNOVATIONS BY TYPE AND NATURE



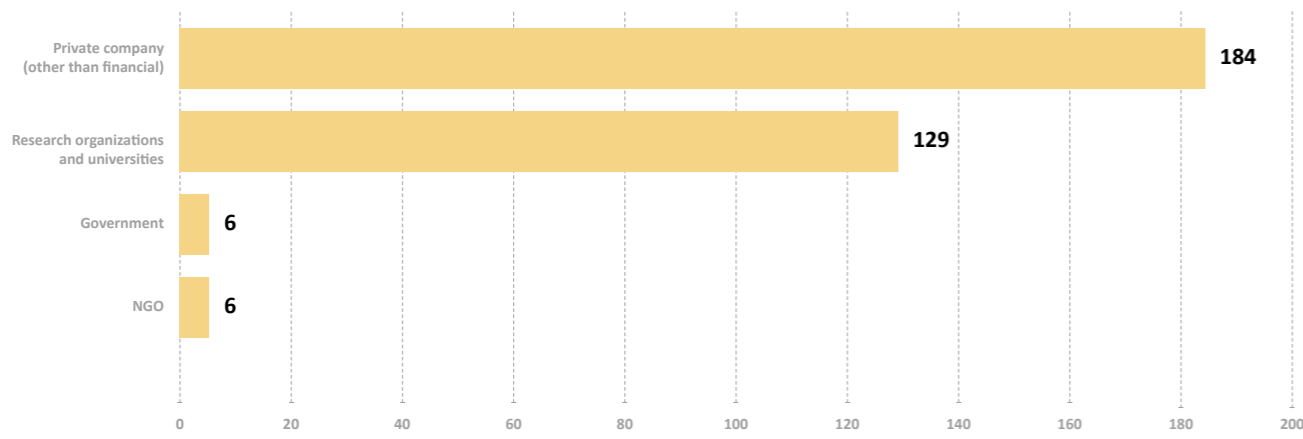
INNOVATION DEVELOPMENT RESULTS FOR SPECIFIC TARGET GROUP/ACTOR



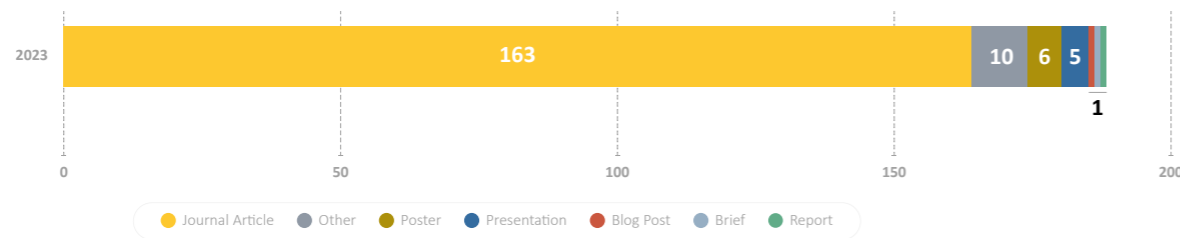
ANTICIPATED INNOVATION USERS BY INSTITUTION TYPE



CURRENT INNOVATION USERS BY INSTITUTION TYPE



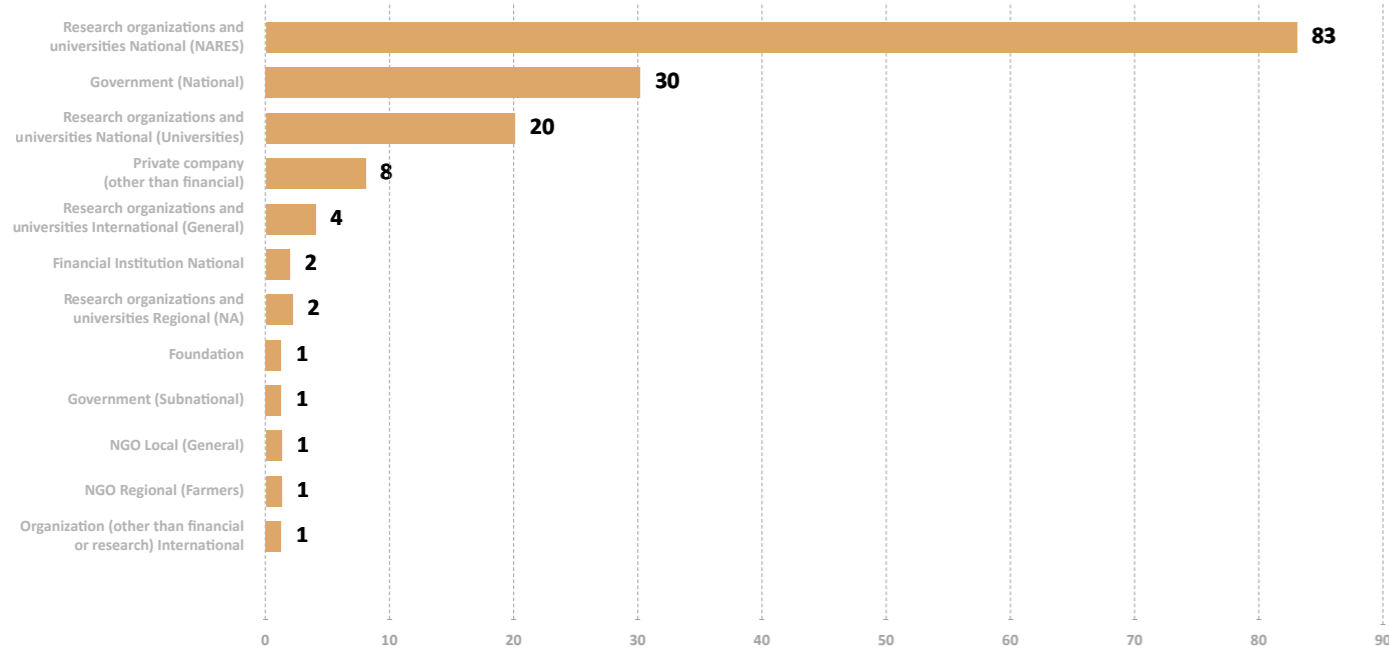
NUMBER OF KNOWLEDGE PRODUCTS REPORTED, BY TYPE



NUMBER OF CAPACITY SHARING FOR DEVELOPMENT TRAINING EVENTS (RESULTS), NUMBER OF PARTNER ORGANIZATIONS INVOLVED, NUMBER OF CGIAR CENTERS INVOLVED, AND NUMBER OF PEOPLE TRAINED



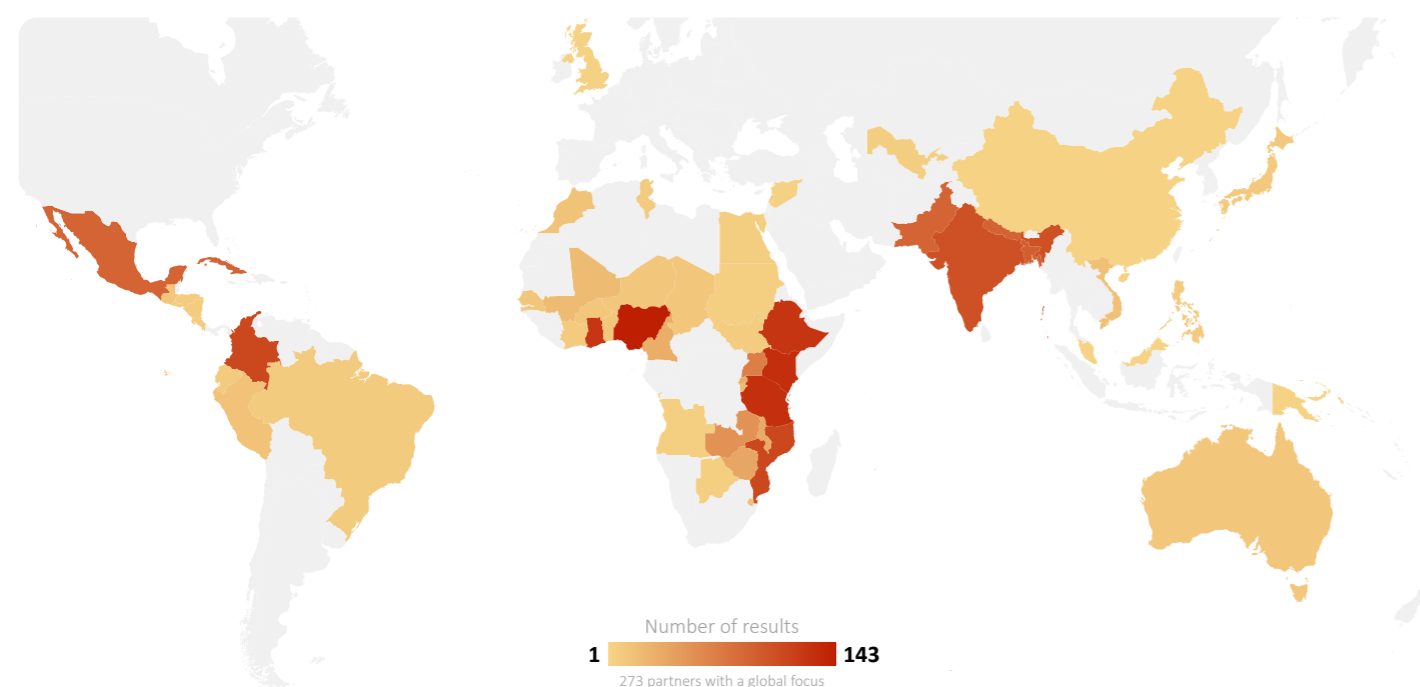
NUMBER OF CAPACITY SHARING FOR DEVELOPMENT RESULTS BY PARTNER TYPE



“Smart Valleys” project for inland valleys, a team from AfricaRice at work.
Credit: AfricaRice, 2023

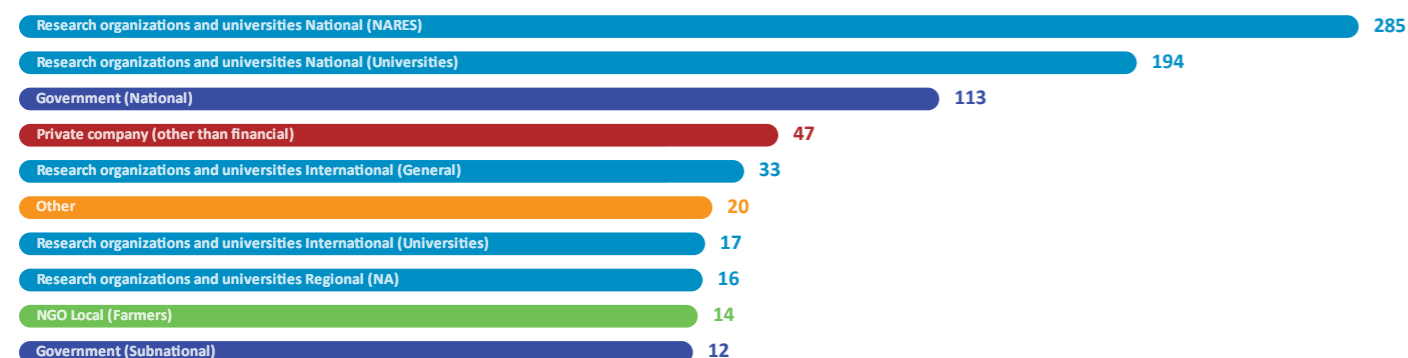
Section 5: Partnerships

PARTNER MAP



Colors represent the number of different partners which collaborated on results achieved in a specific country. One result can impact different countries and therefore the same partner can be associated with more than one country. Source: Data extracted from the [Results Dashboard](#) on 29 March 2024.

TOP 10 PARTNER TYPOLOGIES THAT CONTRIBUTED TO DELIVERING RESULTS



Partnerships and Accelerated Breeding's impact pathways

Accelerated Breeding dedicates an entire Work Package – TRANSFORM – to building sustainable and impactful partnerships, particularly with NARES. Whilst this is done daily through support to regional crop networks and systematic approaches described elsewhere in this report, TRANSFORM also coordinates an annual Genetic Innovation-[NARES Leadership Consultation meeting](#). This brings together leaders from the Genetic Innovation Science Group, NARES, SROs, and advanced research institutes from across Africa. This meeting has become a key event for many CGIAR partners working on crop breeding, essential for communication, co-development and planning of improved partnership methods.

CGIAR-NARES-private sector partnerships are central to the delivery of the Initiative's goals. These partnerships, involving over 600 organizations worldwide, are essential for developing and delivering new varieties to farmers and doing so on a large scale. Much of this collaboration happens at regional level, where 55 crop-region networks enable the co-design and co-creation of more resilient, productive, and nutritious varieties that carry farmer- and market-demanded traits. Accelerated Breeding interventions modernize breeding approaches, aligned to partner-specific improvement plans, systematize collaborative priority setting and [variety development](#), enhance partner roles in a sustainable way, and promote uniform tools, approaches, and standards across programs.

During 2023, impact pathways were strengthened through the development of a draft CGIAR germplasm licensing policy, by the CGIAR Research Initiatives on Seed Equal, Genebanks, and Accelerated Breeding. The draft policy builds on experiences gained across several CGIAR Centers and external organizations. The power of such a licensing strategy is made evident by the example of CIMMYT maize. CIMMYT typically does not charge any licensing fees or royalties. It predominantly uses a systematic licensing strategy to incentivize seed system actors to invest in scaling. License allocations are annually published on CIMMYT's website to ensure transparency on who benefits from CGIAR investments. Between 2017 and 2022, 383 licenses were allocated to 239 public and private partners, evidence that CIMMYT collaborative maize breeding results in farmers having access to nutritious, stress-tolerant corn [hybrids and varieties](#) at scale.

CIMMYT and IITA maize programs also published during 2023 on the adoption and impacts of [CGIAR-related maize varieties](#) in 18 major maize-producing countries in Sub-Saharan Africa during 1995–2015. The impact assessment further exemplifies the role of partnerships in creating powerful impacts. The aggregate annual economic benefit of using new CGIAR-related maize germplasm for yield increase in Sub-Saharan Africa was estimated at USD 1.1–1.6 billion in 2015, and was attributed equally to co-investments by CGIAR funders, public-sector NARES, and private sector partners. The benefit-cost ratios for the CGIAR investment and CGIAR-attributable portion of economic benefits varied from 12:1–17:1, assuming a 5-year lag in the research investment to yield returns.

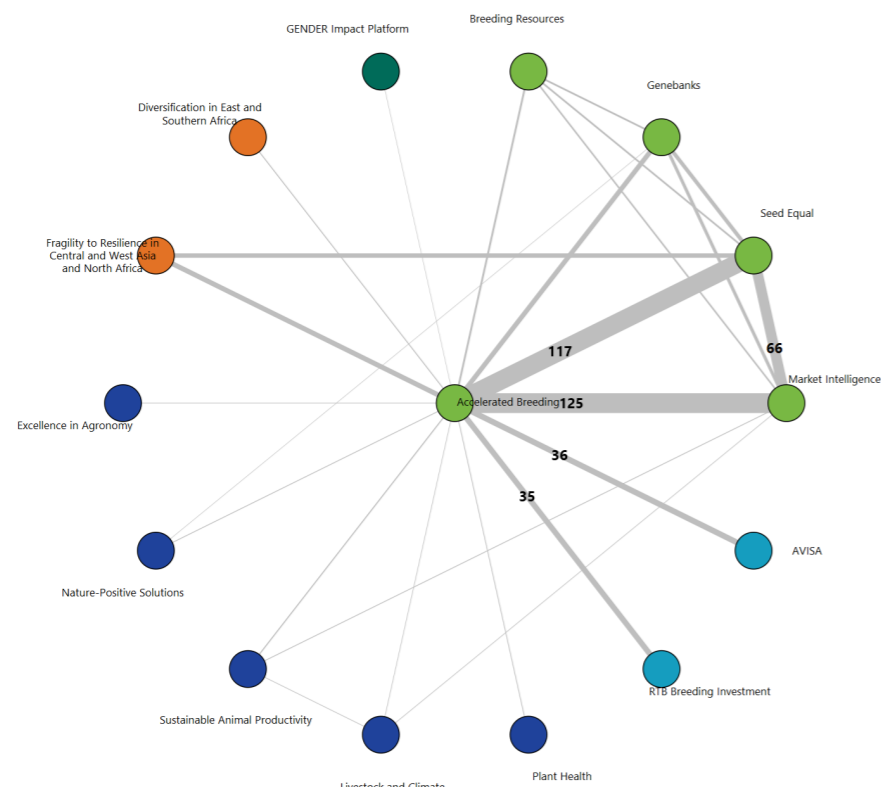
Another example is the [Pan-Africa Bean Research Alliance's](#) (PABRA) partnership model, involving NARES, public and private sector entities, and technology end-users, which has revolutionized bean breeding and seed delivery in Africa. This approach shifted from traditional methods where varieties were bred for yield or resistance to single environmental stresses, to a grain type-led and market-driven approach. This resulted in the release of over 200 improved bean varieties from 2003 to 2011 which exhibit resistance to multiple stresses and cater to niche markets. By 2008, PABRA had reached 7.5 million households, and an additional 14 million by 2013. The success of PABRA led it to define policy recommendations for stakeholders that can be applied across the global common bean value chain. The impact generated by PABRA resulted in the alliance being honored with the prestigious [Africa Food Prize in 2023](#).



Participants in the NARES-CGIAR Leadership Meeting 2023, Marrakech, Morocco. Credit: Adam Hunt / CGIAR, 2023

Section 6: CGIAR Portfolio linkages

ACCELERATED BREEDING INTERNAL PORTFOLIO NETWORK



Connections are sized by the number of reported results. Collaborations where only one result was reported with a linkage between two Initiatives are excluded.

Portfolio linkages and Accelerated Breeding's impact pathways

ReFOCUS works closely with the Market Intelligence Initiative to align on current market segments and TPPs. The Market Intelligence Initiative will provide insights on new market segments, methods for assessing the gender relevance of TPPs, and data and methods to develop pipeline investment cases. The Seed Equal Initiative will provide a comprehensive view of seed producer trait requirements. The [CGIAR Research Initiative on Plant Health](#) will provide data from sentinel sites on the evolution and movement of new plant diseases and insect pests that will be required to keep TPPs relevant to farmer needs.

ReORGANIZE partnered with the Breeding Resources Initiative to develop a process performance management framework providing guidelines and templates for the endorsement and application of KPI design principles and processes, and for the definition and stakeholder endorsement of a KPI monitoring, evaluation and learning framework. These resources facilitate transparent and standardized definition of KPIs across Genetic Innovation. Additionally, ReORGANIZE worked with the Seed Equal Initiative to ensure the SIPOC model developed by ReORGANIZE was well aligned with processes conceptualized within the seed system space. ReORGANIZE and the Seed Equal Initiative collaborated to ensure harmonized thinking and compatibility of terminology across the product development to deployment continuum.

TRANSFORM is working closely with the Seed Equal, Market Intelligence and Breeding Resources Initiatives. All three Initiatives are fundamental to building stronger partnerships, particularly with NARES. TRANSFORM is helping to coordinate engagement with NARES partners to avoid duplication and multiple engagement from Genetic Innovation Initiatives with common NARES partners. This

joint engagement across Initiatives is leading to the development of comprehensive modernization and capacity development plans that address multiple aspects of the breeding value chain, such as gathering market intelligence, implementing improved breeding operations and many others.

DISCOVER has engaged with Work Package 1 of the Market Intelligence Initiative to co-develop simple but adaptive pilot trait valuation approaches. Leveraging subject matter expertise from both the genetics and social science space in a well-documented manner, DISCOVER has developed a first phase pipeline to build upon. This will be used to develop a harmonized and transparent return-on-investment estimation framework. This transdisciplinary approach more effectively enables data-driven development of trait discovery and deployment investment portfolios.

Partnerships with other Accelerated Breeding Work Packages and other Genetic Innovation Initiatives are at the core of ACCELERATE. In 2023, ACCELERATE worked with: (i) the Breeding Resources Initiative to ensure that tools and services are in place and/or being developed to best support needs of breeding programs generally and to implement their Accelerated Breeding work plans, improve data quality standards, maintain pedigree purity, use genomic selection, among others, (ii) the Market Intelligence Initiative and ReFOCUS to better define what a feasible TPP is; (iii) the Market Intelligence Initiative and ReFOCUS to better understand drivers of adoption and impact to align testing and selection schemes with TPPs, (iv) the Seed Equal Initiative and ReORGANIZE to better clarify the purpose of on-farm testing at different stages of the breeding process; (v) the Seed Equal and Genebanks Initiatives on a draft CGIAR germplasm licensing policy.

Section 7: Adaptive management

RECOMMENDATION

SUPPORTING RATIONALE

Accelerated Breeding will work with the Market Intelligence Initiative to put an Application Programming Interface (API) in place between the Breeding Portal and GloMIP.

The Breeding Portal and GloMIP are both much more powerful when their data is aligned. Accelerated Breeding will work with the Market Intelligence Initiative to put an API in place, so that there is consistency between these tools and their complementary functionalities are further empowered. At this stage, GloMIP uses the Breeding Portal APIs to make breeding pipeline and TPP data public. Likewise, the Breeding Portal needs to be able to use GloMIP APIs and data for breeding strategy optimization.

The ReFOCUS, TRANSFORM, and ACCELERATE Work Packages from Accelerated Breeding will coordinate with one another and with the Market Intelligence Initiative to revise TPPs to ensure they are in-demand, impactful and feasible to develop within a reasonable timeframe.

After the progress made in 2022 and 2023 to describe breeding pipelines, TPPs and the market segments they serve, it is clear that TPPs require revision to ensure they are in-demand, impactful and feasible to develop within a reasonable timeframe. Between ReFOCUS, TRANSFORM, ACCELERATE and the Market Intelligence Initiative, multiple groups have been working with breeding teams and partners in these areas. Going forward, the revision of TPPs should be done as a coordinated effort.

In 2024, ACCELERATE will work with breeding teams to capture breeding schemes in the Breeding Scheme Manager.

The Breeding Pipeline Manager was originally made available to both CGIAR and non-CGIAR users to capture breeding schemes. For quality assurance purposes, the tool has been adjusted and renamed the Breeding Scheme Manager to link with market segments, TPPs, and breeding pipelines as captured and quality-assessed in the Breeding Portal. Going forward, breeding schemes will be captured in the Breeding Scheme Manager. The Breeding Pipeline Manager will remain available for non-CGIAR users.

In 2024, breeding teams will develop, manage, and track progress against (at least) their Accelerated Breeding work plans in the Program Management Platform (PMP).

In 2022 and 2023, breeding teams developed work plans in the Project Management Center (PMC). The PMC was a useful tool but did not help users conceptualize alignment between Initiatives or between Initiatives and bilaterally funded projects. Ontological analysis performed in 2023 led to the development of the Program Management Platform. Effective from 2024, breeding teams will be able to use the tool to align workplans across Initiatives and projects. This will result in reduced transaction costs and facilitation of cross-Initiative/project learning.

Accelerated Breeding will work with the CGIAR-NARES Core Technical Team to develop metrics to assess partnership quality.

Feedback from the Core Technical Team comprising representatives from CGIAR, NARES and SROs indicated the need to develop metrics to assess partnership quality as a primary focus for 2024.

Accelerated Breeding will work with the 1000 farms team and with breeding teams that have implemented on-farm trialing to verify performance prior to registration to develop guidance regarding best practice for On-Farm Verification.

On-farm trials can be used for many purposes. Greater clarity is regarded around what is recommended best practice for verification of performance prior to variety registration (i.e., the "On-Farm Verification" stage). Between the 1000 Farms Project and the breeding teams that implemented on-farm trialing to verify performance prior to registration, there is invaluable experience that should be incorporated into recommendations to CGIAR-NARES breeding networks.

Accelerated Breeding will approach funders to support NARES to make greater contributions to the development of regional germplasm. Accelerated Breeding will also work with NARES to develop projects to have something tangible and concrete to propose to funders.

Through the assessment of NARES that have been conducted by TRANSFORM, it has become evident that oftentimes NARES do not have the capacity to increase their contribution to the development of regional germplasm. A creative solution is required to provide NARES with the funding required to develop the necessary capacity while ensuring continuity of breeding progress.

Section 8: Key result story

Transforming breeding partnerships for greater impact

A new approach to collaborative breeding and partnerships is revolutionizing demand-driven varietal development and boosting regional breeding capacity for many crops in Africa and South Asia.



Breeding Better Banana project in Tanzania. The project seeks to develop and deliver improved hybrid cooking banana in Tanzania and Uganda. Credit: IITA, 2018

Primary Impact Area



Other relevant Impact Areas targeted



Contributing Initiatives

Market Intelligence · Breeding Resources

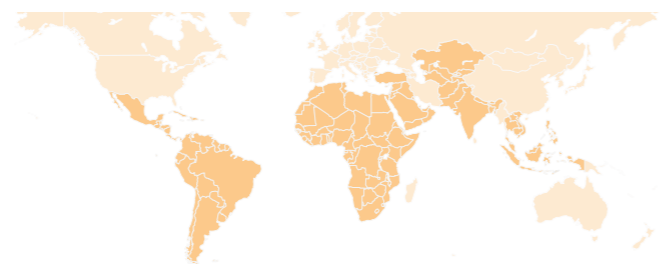
Contributing Centers

(AfricaRice- Africa Rice Center) · (Bioversity (Alliance)- Alliance of Bioversity and CIAT- Headquarter (Bioversity International)) · (CIAT (Alliance)- Alliance of Bioversity and CIAT- Regional Hub (Centro Internacional de Agricultura Tropical)) · (CIP- Centro Internacional de la Papa) · (ICARDA- International Center for Agricultural Research in the Dry Areas) · (IITA- International Institute of Tropical Agriculture) · (IRRI- International Rice Research Institute) · (Primary: CIMMYT- Centro Internacional de Mejoramiento de Maíz y Trigo / International Maize and Wheat Improvement Center)

Contributing external partners

ACIAR- Australian Center for International Agricultural Research; ARC- Agricultural Research Corporation; ASARECA- Association for strengthening Agricultural Research in Eastern and Central Africa ; BARI- Bangladesh Agricultural Research Institute; BMGF- Bill & Melinda Gates Foundation; BMZ- Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung / Federal Ministry of Economic Cooperation and Development (Germany); CCARDESA- Centre for Coordination of Agricultural Research and Development for Southern Africa ; CORAF/WECARD- West and Central African Council for Agricultural Research and Development ; CSIR- Council for Scientific and Industrial Research (Ghana); DARS- Department of Agricultural Research Services; DR&SS- Department of Research and Specialist Services (Zimbabwe); EIAR- Ethiopian Institute of Agricultural Research; FCDO- Foreign, Commonwealth & Development Office (formerly DFID) (United Kingdom); IAR- Institute of Agricultural Research (Nigeria); ICAR- Indian Council of Agricultural Research; IER- Institut d'Economie Rurale (Mali); IGKVV- Indira Gandhi Krishi Vishwavidyalaya University; IIAM- Instituto de Investigacao Agraria de Mozambique; ISRA- Institut Senegalais de Recherche Agricole; KALRO- Kenya Agricultural and Livestock Research Organization; NARO- National Agricultural Research Organisation (Uganda); TARI- Tanzania Agricultural Research Institute; USAID- U.S. Agency for International Development; ZARI- Zambia Agriculture Research Institute

Geographic scope



Western Africa · Eastern Africa · Northern Africa · Middle Africa · Southern Africa · Southern Asia · South-Eastern Asia · Central Asia · Western Asia · Latin America · the Caribbean

Accelerated Breeding has a bold and exciting vision for a new way of developing international varieties in collaboration with partners, often National Agricultural Research and Extension Systems (NARES). This approach is more inclusive, demand-driven, and effective – leading to greater impact. CGIAR breeding teams are deploying innovative methods to grasp local needs and align regional crop breeding efforts with national priorities. They are also supporting partners in expanding and taking the lead in breeding efforts, where they have a clear comparative advantage.

Developing and deploying new crop varieties in developing countries, especially in regions with minimal private sector investment, demands extensive collaboration involving a multitude of partners with different mandates and priorities. [For over 50 years](#), CGIAR has led the development of germplasm as international public goods, while supporting partners in building their own breeding capacities and disseminating improved varieties.

As capacity at national institutions has developed, and to respond faster to rapidly emerging challenges (pests, diseases, population growth, sustainability, and climate change), a new mode of partnership is required to ensure ownership and effective division of labor among partners, acknowledging their comparative advantage and ambitions.

This new approach more effectively utilizes all the available talents across CGIAR and national systems while ensuring clear roles and responsibilities for variety development and rapid deployment.

CGIAR and partners each offer comparative advantages to the international variety development effort. By integrating international and national breeding efforts, synergies are achieved, resulting in higher rates of genetic gain for all countries within a given region.

This approach will result in more impactful breeding for millions of farmers in Africa and South Asia who rely on CGIAR and national systems for improved germplasm. And greater involvement of those making variety release decisions in the development process will increase the likelihood of the best variety being registered and released to farmers.

The process begins by better understanding national priorities through broad in-country stakeholder consultations- **Product Design Team (PDT) meetings** – with farmers, consumers, processors, industry, and social scientists. The outcome is the alignment of

regional and national breeding efforts with farmer and consumer demand. Thus, CGIAR breeding is becoming more demand-driven and inclusive.

Close to 100 Product Design Team (PDT) meeting have been conducted throughout Sub-Saharan Africa and South Asia since early 2022 across a range of crops including [maize](#), sorghum, matooke (cooking banana) and [potato](#), resulting in significant shifts in regional breeding strategy and partner roles.

By actively participating in the international breeding process and with technical support from CGIAR, partners are expanding their breeding capabilities.

Many partners have developed **detailed plans** specifying the areas in which they intend to enhance their breeding capacity and impact through breeding. With support from CGIAR to implement these plans, partners gain comparative advantage in the international breeding effort, augmenting their role and elevating the overall quality of breeding at the national and international level. In turn, spurring an upward spiraling of the benefits described above.

In Southern Africa for instance, [several unique maize country specific market segments](#) have been identified that are best addressed through national breeding programs which are now receiving support from CGIAR to scale up their breeding efforts. Similarly in West Africa, as a result of mapping national capacities and identifying regional priorities for various dryland crops including sorghum and millet, up to 50 percent of operational budget from CGIAR-coordinated breeding projects has been allocated to national partners who have a stronger comparative advantage to breed for specific regional market segments.

The systematic augmentation of national partner roles ensures regional breeding efforts are better aligned to national needs, while continuously supporting local breeding. This approach fosters strong ownership from national partners, who are often also responsible for variety deployment.

This new mode of collaboration is a win-win for both CGIAR and its regional partners. Supporting national partners to scale up their breeding efforts builds local capacity and ensures local ownership, while allowing CGIAR to focus on upstream research and regional priorities.



The new approach CGIAR is using to engage with partners is refreshing and quite distinct from past ways of working. It is inclusive and takes into consideration our own national priorities and development plans. It also allows us to grow as national programs and develop essential skills and expertise to manage our own breeding pipelines.

Maryam Daud, Sorghum Breeder at Lake Chad Research Institute



Front cover photo

Farmer Field Days in Rwanda.
Credit: IITA, 2023

Back cover photo

Jacinta Jimeno, CIMMYT's IWYP Hub Coordinator with her team selecting healthy wheat spikes at CIMMYT experimental station in Toluca, Mexico.
Credit: Alfonso Cortés, CIMMYT, 2020



INITIATIVE ON
Accelerated Breeding