联合国粮食及农业组织 Food and Agriculture Organization of the United Nations Organisation des Nations Unies pour l'alimentation et l'agriculture Продовольственная и сельскохозяйственная организация Объединенных Наций Organización de las Naciones Unidas para la Alimentación y la Agricultura منظمة الأغذية والزراعة للأمم المتحدة

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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 7of the Provisional Agenda

INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Twelfth Session

Rome, 10 – 12 December 2024

SUBMISSIONS FROM INTERNATIONAL ORGANIZATIONS AND INSTRUMENTS

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I. INTRODUCTION

1. The Commission, at its Nineteenth Session, thanked the international instruments and organizations for providing information on their policies, programmes and activities relevant to its prioritized themes. The Commission requested its Secretariat to continue seeking inputs on prioritized themes of the regular sessions from international instruments and organizations and to make them available for its information.[1]

2. In October 2024, FAO invited international organizations and instruments to report activities undertaken in relation to plant genetic resources for this session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (Working Group).

3. The reports from the Global Crop Diversity Trust[2], Global Forum on Agricultural Research and Innovation (GFAiR),[3] the International Seed Federation (ISF)[4], the International Union for the Protection of New Varieties of Plants (UPOV)[5], the International Treaty on Plant Genetic Resources for Food and Agriculture[6] and the CGIAR System[7], and are presented as annexes to this document.

[1] CGRFA-19/23/Report, paragraph 135.
[2] Submission of 1 October 2024
[3] Submission of 15 October 2024
[4] Submission of 5 November 2024
[5] Submission of 6 November 2024
[6] Submission of 8 November 2024
[7] Submission of 19 November 2023

ANNEX 1

REPORT FROM THE GLOBAL CROP DIVERSITY TRUST

Established in 2004 as an independent international organization, the Global Crop Diversity Trust (Crop Trust) operates from Bonn, Germany within the framework of the International Treaty on Plant Genetic Resources for Food and Agriculture (the Treaty), in accordance with the overall policy guidance provided by the Governing Body (GB) of the Treaty. The Crop Trust's objective, as stated in its Constitution, is "to ensure the long-term conservation and availability of plant genetic resources for food and agriculture with a view to achieving global food security and sustainable agriculture." The Crop Trust is pleased to present this report to the Twelfth Session of the Intergovernmental Technical Working Group on PGRFA.

SCIENTIFIC AND TECHNICAL MATTERS

A. Long-term conservation and availability of PGRFA

Support to Article 15 Genebanks

At the core of the Crop Trust is the Endowment Fund, created to provide financial security to globally important collections of crop diversity in perpetuity. To date, the Executive Board has approved long-term funding from the Endowment Fund for the essential operations of nine CGIAR genebanks, the genebank of CePaCT, and also the genebank of WorldVeg, all of which conserve collections which are available in the Multilateral System of the Plant Treaty. The Executive Board also approved transition funding for CIFOR-ICRAF from 2022 to 2024. These international collections play a crucial part in the development and implementation of a rational, efficient and effective global system for ex situ conservation of crop diversity.

This long-term funding is supporting the conservation and availability of more than 20 crops in 10 locations across five continents in the CGIAR genebanks[8]. The support covers essential operations almost fully in the case of rice at the International Rice Research Institute (IRRI) in the Philippines, beans and forages at the Alliance of Biodiversity International & CIAT in Colombia, and the seed collection at the International Institute for Tropical Agriculture (IITA) in Nigeria. It covers essential operations to a more limited extent for the other genebanks.

In addition to long-term funding from the Endowment Fund, the Crop Trust has raised bilateral funding to supplement its long-term commitments. In collaboration with the Plant Treaty, we established a Joint Funding Facility to provide support to Article 15 genebanks not part of the One-CGIAR system, to mobilize resources for international genebanks in need of predictable funding during a period of transition. With support from the German Corporation for International Cooperation (GIZ) and the Government of Norway (via Norad), the Crop Trust and Plant Treaty thus secured transitional support for the essential operations of the genebanks of WorldAgroforestry (CIFOR-ICRAF), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) and WorldVeg for the period 2024-2025. There will be a meeting of non-CGIAR Article 15 genebanks in late 2024 to coordinate activities, jointly organized with the Plant Treaty Secretariat.

The Crop Trust has joined with the Plant Treaty Secretariat to support the rejuvenation of the Article 15 coffee collection maintained by CATIE in Costa Rica. Based on the recommendations of the global coffee conservation strategy, and a follow-up detailed accession-by-accession study funded by Felco SA, the collection is being moved to a new, better field site at CATIE, while making sure that all accessions are represented by adequate numbers of trees and are fully documented. This work started with the most at-risk accessions. During May 2022 to May 2023, 168 coffee accessions were identified as priorities, and 6 samples of each, totalling 1,008 plants, were grafted to rootstocks and transplanted to a new field site. The second phase of the project started in 2024 with funding from GIZ through the Joint Funding Facility. As part of this phase, an additional 2,400 plants representing 400 accessions will be transplanted in the new site.

[8] https://www.cgiar.org/initiative/genebanks/?section=about

Total long-term funding from the Endowment Fund plus bilateral support to international genebanks amount to over USD 76 million since 2006.

Support to national genebanks

BOLD Project. The Biodiversity for Opportunities, Livelihoods and Development[9] (BOLD) Project was officially launched in June 2021. This 10-year initiative is funded by the Government of Norway (via Norad). BOLD is coordinated by the Crop Trust in close partnership with the Norwegian University of Life Sciences (NMBU), and with the participation of NordGen and the Plant Treaty Secretariat. BOLD receives advice from a panel of experts, which includes the Plant Treaty Secretariat and the Seeds and PGR Unit of FAO. The project is divided into the following areas of work.

Capacity and Resource Development. This element of the project is strengthening the capacity of genebanks in 15 partner countries (Azerbaijan, Bhutan, Cuba, Ecuador, Egypt, Laos, Lebanon, Morocco, Pakistan, Peru, Sudan, Tanzania, Uganda, Vietnam, Yemen) to manage, document, conserve and duplicate crop diversity and make it available to farmers and breeders. External reviews of partner genebanks were completed in 2022, which resulted in plans for: (1) upgrading facilities and equipment; (2) training staff on genebank operations and policies; (3) implementing genebank data and quality management systems; and (4) identifying and making available useful diversity. Project agreements were thereafter signed with 13 genebanks (Azerbaijan, Ecuador, Egypt, Laos, Lebanon, Morocco, Pakistan, Sudan, Tanzania, Uganda, Vietnam, Yemen, and Bhutan). In 2023, 76 genebank staff from 15 national genebanks were trained in basic genebank operations and 16 staff from 10 genebanks enrolled in three online courses on plant genetic resources conservation and use. Capacity development included 13 webinars (seven on quality management system, QMS, and four on Genesys), two IT workshops (Uruguay, Azerbaijan), and five QMS intensive visits (Ecuador, Azerbaijan, Pakistan, Morocco, Uganda). QMS intensive visits and IT workshops continued in other countries in 2024. In addition, three agreements are underway with CGIAR Centres (ICARDA, CIP, and IRRI) on capacity development and knowledge exchange with the national genebanks. The work of the Emergency Reserve for Genebanks, and the emergency support for Ukraine are described in a separate document of the Treaty Secretariat.

Making New Diversity Available. This component facilitates the development and use of new diversity of selected crops by breeders and farmers for climate change adaptation and food security in 20 partner countries. It includes on-farm trials and other participatory approaches to ensure a more effective flow of novel crop diversity to farmers. Seven project agreements were signed in 2022 and continued during 2023. Six of the projects are pre-breeding and participatory evaluation projects that focus on (1) alfalfa, (2) barley and durum wheat, (3) finger millet, (4) grasspea, (5) potato and (6) rice. The seventh project is using state-of-the-art informatics to share and analyze all data generated in the pre-breeding and evaluation projects. Since 2021, six crop wild relative-derived durum wheat varieties[10] have been released (in Morocco, Syria, Iran) and one late-blight resistant potato variety[11] adapted to the high Andes (in Peru).

Genebanks and Seed Systems. This work package comprises a research programme led by NMBU to explore different, complementary ways of enabling crop diversity to be more readily accessible to farmers. Models for strengthening the connections between genebanks and national seed systems are being documented and developed. Innovative pilot efforts by national genebanks in four partner countries will then be supported to actively contribute diversity to national and regional seed systems as examples for other national programs to adopt or adapt, as appropriate. Project launch workshops were held in Uganda, Ecuador, Bhutan and Tanzania with research partners and a wide range of stakeholders. NMBU and its partners co-developed the Genebank and Seed Systems toolkit,[12] comprising a methodological framework and data collection tools. The toolkit was pre-tested in selected communities in Uganda and Ecuador and finalized according to the feedback received. It subsequently underwent an ethical review and has now been published after incorporating all feedback and testing it in the remaining countries (Bhutan and Tanzania). Project launch workshops were conducted in all 4 countries with partners and other collaborators. Research teams were

[9] https://bold.croptrust.org/

[10] https://www.icarda.org/media/blog/new-drought-tolerant-crops-resilient-dryland-livelihoods

[11] https://cipotato.org/annualreport2022/inclusive-food-systems-for-resilience/meet-cip-matilde/

[12] https://www.nmbu.no/en/research/projects/seed-system-toolkit

trained on different themes and data analysis workshops were held in Uganda and Ecuador. Roundtable workshops to validate seed system assessment findings have been held in all four countries. Good progress has been made towards preparing the final seed system assessment reports. The report for Uganda is already completed and published on the NMBU website.[13] These reports will inform the development of pilot projects for strengthening linkages between genebanks and seed systems.

A wide array of outreach activities were carried out, reaching academic, government, and civil society audiences, including the postgraduate course 'Smallholder Engagement in Seed Systems: From Field Practice to Science'[14] at Wageningen University & Research, and lectures at various events. An article on the development of resilient and inclusive seed systems for farmers was published[15]. Additionally, a paper on the conceptual framework developed for the BOLD WP3 project was published by the NMBU team.[16]

Regeneration and Safety Duplication at the SGSV. Having launched a call for proposals in late 2021 in coordination with the Plant Treaty Secretariat, eligible partners were selected after two rounds of reviews. In early 2022, negotiations commenced for 53 selected proposals and agreements were signed with 42 partners from 30 ODA countries. These agreements cover 41,146 accessions earmarked for regeneration and 40,090 for safety duplication at the SGSV.

Currently, more than 29,000 accessions have been regenerated through the collective efforts of over 40 partners. About 24,000 accessions have sufficient seeds for storage, first- and second-level safety duplication. Some 17,769 accessions have already been duplicated at the SGSV by 21 partners from 17 countries.

Communications, Engagement and Outreach. During 2024, we have seen a total of 5,617 users visiting the BOLD website,[17] with more than 10,844 pageviews. BOLD communications highlights include:

- Launch of the online Crop Chronicles campaign. With stories,[18] animated videos,[19] podcasts,[20] recipes, Q&As,[21] slideshows, we celebrate the seven crops our partners are working on in WP2.
- Media coverage: during the January-June 2024 period, BOLD has appeared in The Guardian,[22] Devex,[23] The Africa Report, Seed World and the BBC,[24] among others.
- A total of 17 BOLD blogs, among them: Celebrating the BOLD Women Behind Crop Conservation (WP1);[25] Life Insurance for Genebanks (WP4);[26] Breaking the Stigma of Grasspea in South Asia (WP2).[27]
- The BOLD Voices video series continues spotlighting our partners. e.g. in Suriname.[28]
- Social media content related to the BOLD Project is tracked with the hashtag #BOLDcwr. In 2024, it has been mentioned 1512 times, received more than 138,000 likes and reached 15 million people (according to Brand24 software used to track the content with this hashtag).

[13] https://nmbu.brage.unit.no/nmbu-xmlui/handle/11250/3145800
[14] https://www.pe-rc.nl/seed-engagement2023
[15] https://www.pnas.org/doi/10.1073/pnas.2218777120
[16] https://www.pnas.org/doi/full/10.1073/pnas.2218777120
[17] https://bold.croptrust.org/
[18] https://www.croptrust.org/story-articles/potato/
[19] https://www.youtube.com/watch?v=2aCP6AxBkNo
[20] https://www.croptrust.org/news-events/podcasts/crop-chronicles-podcast-grasspea-breaking-a-stigma/
[21] https://www.croptrust.org/news-events/news/pre-breeding-for-dummies-with-anna-backhaus/
[22] https://www.theguardian.com/environment/2024/jan/29/rare-rice-species-suriname-saamaka-maroon-slavery-climate-resilience
[23] https://www.devex.com/news/opinion-how-gene-banks-act-as-guardians-against-climate-uncertainty-107764
[24] https://www.bbc.com/news/articles/c99z7wwq1lgo
[25] https://www.croptrust.org/news-events/news/bold-women-crop-conservation/
[26] https://www.croptrust.org/news-events/news/life-insurance-for-genebanks/
[27] https://www.croptrust.org/story-articles/breaking-the-stigma-of-grasspea-in-south-asia/
[28] https://www.youtube.com/watch?v=Sx1ytincA4Y

- Finally, BOLD has been present in many events around the world. Notable highlights include the German Plant Breeding Conference (March 2024); the first International Lathyrus Day, in Ghent, Belgium; and the BOLD Policy Workshop[29] (June 2024).

Building Opportunities for Lesser-known Diversity in Edible Resources (BOLDER). BOLDER was approved by Norad on 7 December 2023 and will be supported with up to an additional NOK 40 million. Growing a diversity of crops is a key strategy farmers can use to protect themselves against climate change. BOLDER will enhance the conservation, production and consumption of key neglected and underutilized species (NUS) that are nutritious, robust, environment-friendly and important for local communities. These crops are important sources of nutrition, but many have fallen out of favor because of the lack of attention paid to them by researchers, breeders and policymakers. By providing farmers in four countries (Benin, Ghana, Uganda, Tanzania) with more options through the increased use of NUS, BOLDER will increase communities' access to foods with high nutritional value and bolster efforts to climate-proof agriculture. As such, BOLDER is part of the Crop Trust's efforts to implement the Vision for Adapted Crops and Soils (VACS), an initiative of the US State Department and the African Union. As a first activity, the capacity development workshop on "Crop Diversity Conservation and Use for African Policy Makers and Practitioners" was organized by the Crop Trust and the Plant Treaty Secretariat in collaboration with the African Union Commission (AUC), hosted by CIFOR-ICRAF at their headquarters in Nairobi, Kenya from 23-27 October 2023. In February 2024 we hosted an inception meeting with key partners: the Alliance of Bioversity International & CIAT, NMBU and WorldVeg. This meeting allowed us to clearly define the roles of all partners across the three project outputs. During this reporting period, we established agreements with these partners and we held stakeholder meetings in July and August 2024. These meetings have been used to identify priority NUS in the project countries. We also recruited a Project Specialist who will support the implementation and management of this component.

National Seeds Collections for Climate-Resilient Agriculture in Africa (Seeds for Resilience, SFR). Seeds for Resilience SFR is a 5-year project which started in May 2019. The project is funded by the Government of Germany (BMZ), through the German Development Bank (KfW). SFR aims to safeguard crop diversity for the long-term in five national genebanks in Africa, and to empower them to develop climate-resilient crop varieties:

- Ethiopian Biodiversity Institute (EBI) in Addis Ababa, Ethiopia.
- Genetic Resources Research Institute (GeRRI) at the Kenya Agricultural & Livestock Research Organization (KALRO) in Nairobi, Kenya.
- National Plant Genetic Resources Centre (NPGRC) at the Zambia Agriculture Research Institute (ZARI) in Lusaka, Zambia.
- National Centre for Genetic Resources and Biotechnology (NACGRAB) in Ibadan, Nigeria.
- Plant Genetic Resources Research Institute (PGRRI) in Bunso, Ghana.

Following external reviews at the start of the project, each partner developed a Recommendation Action Plan (RAP) that identified key areas for improvement. Progress has been made in the implementation of these plans, assisted by training in genebank operations and the procurement of new equipment. These activities ensure the long-term conservation of genebank collections and were combined with the development of 'Germplasm User Groups' (GUGs) to increase awareness and local use of genebank collections.

Capacity building. SFR has delivered capacity building through workshops, technical attachments, and training programs, covering topics such as genebank management. The training sessions have improved the operational efficiency and technical expertise of genebank staff, enabling better management and documentation of seed collections. As a result of these activities, genebank partners have introduced Quality Management Systems (QMS) across all genebank operations, ensuring consistency in procedures such as seed viability testing, regeneration, and documentation. The development of Standard Operating Procedures

[29] https://www.croptrust.org/news-events/news/crop-diversity-meets-climate-policy-in-bangkok/

(SOPs) across the genebank partners has further supported these efforts, providing clear guidelines for the major aspects of genebank management.

The project assisted partners with both first and second level safety duplication of their collections, with a combined total of 4,040 accessions from Nigeria, Ghana, Kenya and Zambia deposited at the Svalbard Global Seed Vault. The project also focused on publishing accession information online via Genesys, and helping genebanks implement the genebank information system GRIN-Global Community Edition (GGCE). SFR genebanks have uploaded over 110,000 accessions to Genesys since the start of the project. The Crop Trust is also supporting genebanks to list their collections in GLIS.

SFR continues to provide equipment to genebank to support operations. Aluminium foil bags, motor vehicles and ICT equipment have been delivered to partners, assisting the collection, conservation and documentation of the genebank collections. Several specialist items for genebank activities have also been delivered to partners, such as seed blowers, counters and aspirators. A further suite of specialist laboratory equipment is due to be sent to partners, which will enhance and improve the efficacy of seed conservation across the genebanks.

Plans are underway for the establishment of new genebank infrastructure upgrades. These include the construction of specialist rooms to dry and store seed to international standards, along with upgrades to a range of seed processing rooms. These improvements are critical to enhancing the preservation and viability of seed collections, ensuring that they are stored optimally for longevity and future users.

Increasing awareness and use of genebank collections. SFR included a 'use' component, to improve the awareness, access and use of genebank crop diversity by farmers. This component included the formation of Germplasm User Groups (GUGs) in each partner country, involving local farmers in the evaluation, selection, and multiplication of crop varieties conserved in the genebanks. Participatory varietal selection trials have been conducted, leading to the identification and multiplication of farmer-preferred crop varieties, particularly those that demonstrate resilience to climate change. To ensure collections reach end users, field evaluation trials with farmers identified important climate-resilient varieties for local use; particularly underutilized crops like traditional leafy vegetables, Bambara groundnut, and sorghum. SFR partners are now developing action plans to guide other national genebanks in sharing collections with user groups.

More generally, SFR trained partners in communications strategy, helped them develop a communications plan and provided outreach materials (such as slide decks and brochures) to support partners in building their public image and reach new audiences. genebanks have now implemented these plans, resulting in increased media exposure and the development of genebank websites. These techniques and tools have increased the genebanks' visibility and connections to farmers, public bodies, researchers and breeders.

Future plans. As the project approaches its final year, efforts are focused on completing the remaining infrastructure upgrades and the second round of external reviews to guide the long-term vision for each genebank. The lessons learned from the SFR project will inform future initiatives with national genebanks, to conserve crop diversity and enable more productive, resilient agriculture in Africa.

Darwin Initiative Project: Sweetpotato, a model for food security and long-term conservation of biodiversity. This project, funded by the UK Government's Darwin Initiative, applies a robust methodology to conserve and use sweetpotato genetic diversity as a model for the long-term, secure conservation of clonal crops in general. The aim is to: (1) collect sweetpotato landraces in Madagascar and Zambia, conserve this diversity both in these countries and *in vitro* and in cryo at the International Potato Centre (CIP) in Peru; (2) clean the material of pathogens; and (3) return pathogen-free planting material of diverse landraces back to farmers in the partner countries. The 3-year, USD 1.34 million project started in June 2022 and will run through March 2025. To date, collection of farmer sweetpotato landraces from both countries, Madagascar and Zambia, has been completed and the landraces have been placed into *in vitro* culture by CIP-Nairobi. The number of landraces collected and securely transported to CIP-Lima far exceeded targets with 260 from Zambia (collected under the Seeds for Resilience project) and 75 from Madagascar. 27 landraces from Zambia are clean of pests and diseases and 22 of these were successfully repatriated. 16 of these landraces were successfully multiplied and over 44,000 vines have been distributed to smallholder farmers in 8 communities in Zambia by the end of April 2024. 25 clean landraces were repatriated to Madagascar, of which 22 survived and over 7,000 vines have been distributed from 16 landraces to farmers in 11 communities. Two shipments of landraces between CIP-Kenya and CIP-Peru have occurred and a subset of these landraces is in the process of *in vitro* multiplication for cryopreservation.

Quality and Risk Management Systems. The Crop Trust strives to define and raise quality standards in national and international genebanks through partnerships and projects. Through in-person and online events, genebank partners develop their capacity to implement continuous improvements in their administrative, technical and operational performance in alignment with established standards. Implementing a robust quality management system (QMS) helps them to deliver crop diversity and services that meet user expectations consistently. Highlights of QMS capacity-building events and activities in 2024 include:

- An in-person Genebank Operations and Advanced Learning (GOAL) workshop was organized with the objective of building the capacities of national and regional genebanks to manage crop diversity in alignment with international agreements. The workshop was on 4-8 March 2024 in Lusaka, Zambia with the participation of SADC partners.
- Standard operating procedures (SOPs) for all SFR genebanks were edited and harmonized in preparation for the creation of their genebank quality manual, a set of documents that outline the quality management system of a genebank. It includes policies, procedures, and responsibilities for ensuring product and service quality, and provides a framework for consistent quality management practices.
- QMS Community of Practice (QMS-CoP) online sessions are organized to tackle the technical aspects of conservation in an informal forum. One online presentation was offered to the SFR community in 2024, on the subject of "Improving user access to the diversity in your genebank: subsets and core collections."
- SFR genebanks participated in a collective exercise that identified new and emerging threats to their operations. Forty new risks were included in the updated version of their Genebank Red Book of Risks.

Support to the Svalbard Global Seed Vault

Safety duplication is recognized by the FAO Genebank Standards as an essential element of good genebank practice. The Crop Trust supports the duplication under black-box conditions of crop diversity collections at the SGSV as an ultimate safety net for the global system of genebanks. At present, the SGSV holds 1,301,397 samples from 116 genebanks, encompassing 1,171 genera and 6,185 species. In total, 34,270 accessions were added to the Vault in 2024 by 37 institutes. Of the 1,301,397 accessions deposited in the Vault, 17,769 have been deposited with funding from the Biodiversity for Opportunities, Livelihoods and Development (BOLD) project by 21 partners. 19 of these partners deposited for the first time in 2023 and 2024. 4,040 accessions from Nigeria, Ghana, Kenya and Zambia were deposited with funding from the Seeds for Resilience (SFR) project. The Seed Vault celebrated its 15-year anniversary in 2023. The Endowment Fund supports the running costs of the SGSV.

B. Strengthening information systems for genebanks

The Crop Trust continues to support the development and adoption of two information systems: Genesys[30] and GRIN-Global Community Edition[31] (GGCE), convenes the Community of Practice on Data Management, and organizes regional workshops on genebank data management.

Community of Practice on Data Management

The Crop Trust organizes monthly teleconferences in English, Spanish and French for the Community of Practice on Data Management. In the first half of 2024, the community consisted of 150 staff from international and national genebanks. In March 2024, a regional workshop was organized on data

[30] https://www.genesys-pgr.org
[31] https://ggce.genesys-pgr.org

management for genebanks in New Delhi with support from ICAR and the India country office of the Alliance of Bioversity & CIAT. Representatives from 13 genebanks in 11 countries (Bhutan, Laos, Morocco, Vietnam, Bangladesh, ICRISAT, IRRI, WorldVeg, Australia, New Zealand and India) attended the training. The next workshop is planned in Colombia in November, with assistance from Agrosavia.

Genesys

The Crop Trust continues to support the development of Genesys as a fundamental component of an effective global genebank system. Genesys has been managed by the Crop Trust since 2013, with the Plant Treaty Secretariat participating in the advisory committee since the beginning. Genesys now allows searching data across over four million active accessions held in 509 genebanks. The largest providers of data to Genesys are the CGIAR genebanks, USDA NPGS (USA), Embrapa (Brazil), and the European Cooperative Programme for Plant Genetic Resources (ECPGR). Genesys continues to be integrated and connected with FAO's World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS) and the Plant Treaty's Global Information System for PGRFA (GLIS).

The Crop Trust works continuously with data providers to help them share up-to-date information about their collections and actively promotes and encourages genebanks to publish data in Genesys. In 2024,

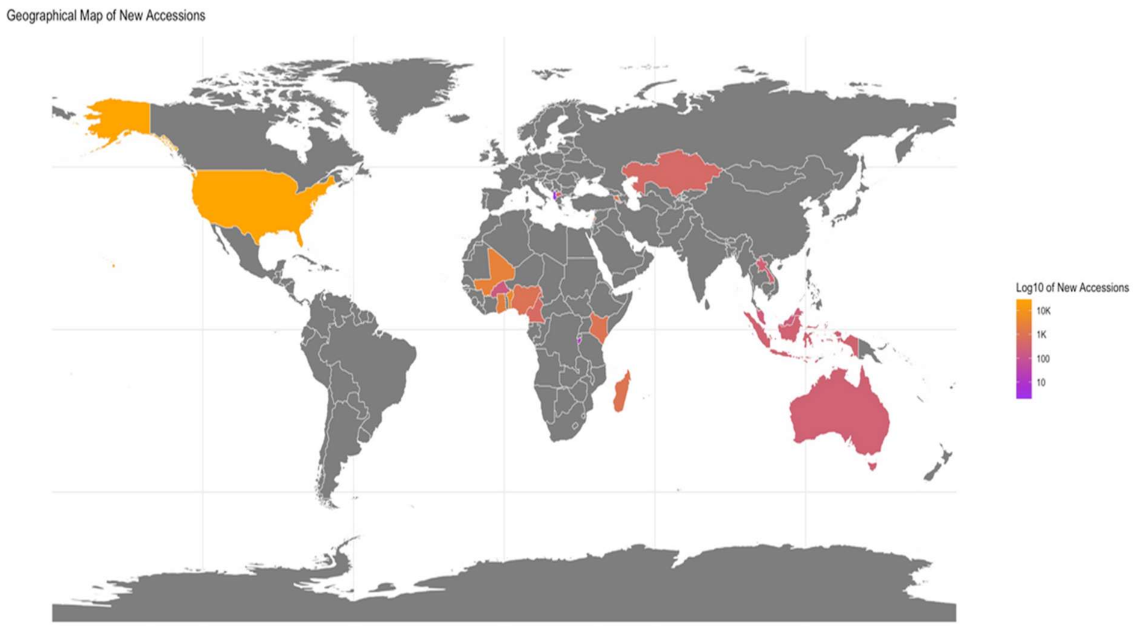
one new agreement to publish data was established, and another two were initiated, with COGENT and ICTA Guatemala.

To facilitate this onboarding of new partners, the Genesys team has organized six presentations in the first half of 2024, consisting of 4 webinars open to all partners, one webinar focused only on the BOLD partners, and one presentation during the CoP-DM. Three webinars on uploading trait data[32] were organized in February and were attended by 56 genebank staff from 40 institutes. The two webinars on uploading passport data[33] in April were attended by over 32 genebank staff. In the CoP-DM sessions of June, we presented Embedded Genesys and made the presentation available on YouTube.

In 2024, we further improved Genesys with: better tools for genebanks to upload, document, validate, and publish trait data and make such data searchable[34]; an updated Subsetting Tool[35] (by the Alliance Bioversity-CIAT); and a new version of Embedded Genesys[36]. Embedded Genesys is a widget that enables mirroring data from Genesys on genebank websites. It includes support for browsing and searching passport data, displaying accession details, maps, subsets and datasets associated with each accession. It includes the option to handle germplasm requests, characterization and evaluation data, subsets, data visualizations such as overviews and maps, similarity search tool, passport data completeness scores (PDCI) calculations, and the option to display the data in different languages. Currently, the following genebanks implement Embedded Genesys on their websites: WorldVeg[37], International Center for Biosaline Agriculture (ICBA)[38], NACGRAB (Nigeria)[39], IITA[40], ILRI[41] and AfricaRice[42].

In the first half of 2024, more than 1,200,000 accession records have been refreshed and an additional 46,964 accessions have been added to Genesys. The additions come from 27 national genebanks located in 20 different countries as shown in the map below:

[32] https://www.genesys-pgr.org/content/news/173/in-case-you-missed-it-webinar-recording-part-3
[33] https://www.genesys-pgr.org/content/news/175/passport-data-upload-via-the-genesys-uploader-tool
[34] https://www.genesys-pgr.org/content/news/158/unleashing-traits-through-dynamic-visualization
[35] https://www.genesys-pgr.org/content/news/156/genesys-rolls-out-the-subsetting-tool
[36] https://www.genesys-pgr.org/content/news/131/embedded-genesys
[37] https://genebank.worldveg.org
[38] https://www.biosaline.org/about-icba/facilities/genebank/accessions
[39] https://www.nacgrab.gov.ng/seed-genebank/seed-collection
[40] https://www.iita.org/germplasm-request/
[41] https://www.ilri.org/seed-request/
[42] https://www.africarice.org/request-for-germplasm



Countries of genebanks contributing to Genesys in 2024.

Around half of these new accessions come from the USDA genebanks of the National Plant Germplasm System. The diversity of these accessions is noteworthy, as they represent over 2,300 different species of crop wild relatives, improved cultivars and genetic stocks. It is possible to explore USDA's new accessions.[43]

Partners of the BOLD project have contributed to the second-highest number of new accessions during this time period. The project is helping 42 partners around the world to regenerate seed and to back them up both at another genebank and at the SGSV for long-term safekeeping. Genesys displays data from these partners' 2023 and 2024 deposits to the SGSV. Some of these partners also share passport data with Genesys that extends beyond the scope of the project, for example Mali, Armenia and Albania. The dedicated page[44] for these genebanks provides easier access to this data. The BOLD project is working with another 15 national genebanks[45] in -Africa

[43] https://www.genesys-pgr.org/a/overview/v285JwmYBxr
[44] https://www.genesys-pgr.org/network/BOLDWP4
[45] https://www.genesys-pgr.org/network/BOLD
https://genebank.worldveg.org
[45] https://www.biosaline.org/about-icba/facilities/genebank/accessions
[45] https://www.nacgrab.gov.ng/seed-genebank/seed-collection
[45] https://www.iita.org/germplasm-request/
[45] https://www.ilri.org/seed-request/
[45] https://www.africarice.org/request-for-germplasm
[45] https://www.genesys-pgr.org/a/overview/v285JwmYBxr
[45] https://www.genesys-pgr.org/network/BOLDWP4
[45] https://www.genesys-pgr.org/network/BOLD

Asia and Latin America to strengthen their capacity to manage, document, conserve and back up the crop diversity that they hold by upgrading their IT infrastructure, adoption of GGCE for internal data management, and making data available in Genesys. Lebanon and Laos uploaded passport data to Genesys during the first half of the year. Lebanon published over 1,400 accessions of crop wild relatives collected jointly with the Millenium Seed Bank between 1996 and 2010, and repatriated to the country in 2013. Laos published 285 rice accessions, all of which are traditional cultivars originating from the country.

During the reporting period, partners have added 25 trait datasets in a searchable format. CIP[46] added data on level of ploidy and chromosome number of different potato species, while IITA, ILRI, ICARDA, and ICRAF published agromorphological characterization datasets. National genebanks of Kenya, Ghana and Nigeria uploaded characterization data on sorghum, finger millet, rice, eggplant and maize. WorldVeg uploaded one dataset characterizing 5,270 accessions of chillies across 88 traits, and one evaluation dataset against different viruses.

GRIN-Global Community Edition

The Crop Trust collaborated with the US Department of Agriculture (USDA) and Bioversity International in the 2010's to develop a free-to-use genebank data management software package, GRIN-Global, which was initially released in 2011. In 2019, work started on the next generation of the system, GRIN-Global Community Edition (GGCE), under the umbrella of the CGIAR Genebank Platform. The Crop Trust has strengthened the team that supports genebanks in data management and publishing, which since late 2021 also includes the development and maintenance of GGCE in collaboration with international and national genebanks.

GGCE is focused on the use of barcoding and other information technologies to facilitate data acquisition and retrieval by technicians, and improve data quality in routine operations, including reporting on distributions with the SMTA, assignment of DOIs, interactions with Genesys, workflow support and email notifications to genebank staff.

The BOLD Project provides support from 2024 onwards to 15 national genebanks in information technologies and automation of genebank operations, backed by GGCE. The genebanks of Ecuador, Morocco, Azerbaijan, Uganda, and Pakistan are part of the first batch receiving support for migration to GGCE. The same approach was taken in the Seeds for Resilience project, where the five partner national genebanks received support to upgrade their information infrastructure and data management, with Kenya and Nigeria successfully using GGCE for collection management, and Ghana and Zambia making good progress towards this goal. On-site intensive training and support with GGCE was provided to IITA and Ghana in the first half of 2024.

C. Global crop conservation strategies (GCCS)

The three-year project on "Mainstreaming the Global Crop Conservation Strategies in Plant Treaty Processes[47]" is led by the Crop Trust in close collaboration with the Plant Treaty Secretariat. It started in December 2022 and is funded by the German government. The data, results, and recommendations of the GCCS are relevant to many of the existing work areas of the Plant Treaty. As they are produced by subject matter experts acting in their personal capacities, they can provide a valuable additional channel for strengthening the evidence-base for the Plant Treaty's work. Furthermore, mainstreaming the GCCS in the processes of the Plant Treaty could facilitate implementation of the strategies.

Project activities conducted in the reporting period included: (1) production of a document outlining major findings and recommendations following a review of survey data from 15 recent GCCS processes and an effort to integrate these data into a combined database; (2) preparation of summaries of the GCCS tailored to different Plant Treaty stakeholders; (3) consultations with representatives of the *Ad Hoc* Technical

[46] https://www.genesys-pgr.org/datasets/v2QLRrDAeeQ

[47] https://www.croptrust.org/work-1/projects/mainstreaming-the-global-crop-conservation-strategies/

Committee on Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture (ACSU) on their Terms of Reference and how they are related to the GCCS; and (4) supporting selected Plant Treaty contracting parties to notify their Annex 1 collections as available in the Multilateral System. As the Terms of Reference of the ACSU include a task related to global crop conservation strategies, the Crop Trust was invited to participate as an expert observer in ACSU meetings.

RESOURCE MOBILIZATION

Since inception, donors have contributed USD 262.8 million in grants as at 30 June 2024, of which approximately 95.4% has been provided by national governments. Crop Trust received USD 3.8 million in endowment contributions in 2024 as at 30 June. The contributions received during that period were provided by the UK (USD 3.7M) and Limagrain (USD 54K). A contribution is still expected in 2024 from the USA (USD 5.4 million).

Resource mobilization efforts between January and June 2024 included bilateral donor meetings with a number of government donors including Norway, Sweden, US and South Korea. Efforts included further explorations of innovative finance mechanisms For instance, the potential to use a credit guarantee from a donor to partially underwrite the risk of an upcoming institutional investor biodiversity-themed impact fund. The idea was that the partial credit guarantee may be helpful in mobilizing private institutional funding, with a share of the proceeds then benefitting the Crop Trust. Ultimately it was not possible to proceed given the difficulties in ring-fencing particular impact assets in the fund that were a match for the donor's requirements regarding geography and target beneficiaries of the investments (i.e. of smallholder farmers). In addition, the technical services concept developed the previous year by the MBA students at the Frankfurt School was shared with a potential donor to consider for financing. There was further follow-up with the IADB, GEF and GCF during the reporting period, and a proposal was submitted for IADB's consideration as part of the GEF's Innovating Financing window in June.

The Crop Trust also advanced in its exploration of accreditation requirements for GCF with the support of an external consultant. Moreover, an initial analysis was conducted regarding mapping stakeholders in the coconut value chain as a way of preparing the ground for potential fundraising from both public and private sectors in countries where coconut is important economically, and hence where a case could be made to safeguard coconut diversity. In addition, two virtual roundtable sessions were held as part of the UK Breakthrough Agenda initiative to explore the feasibility of attracting climate and biodiversity finance, as well as non-ODA finance to support the Crop Trust's Endowment Fund. Speakers included the Bezos Earth Fund, the Centre for Pacific Crops and Trees (CePaCT) of SPC, ICARDA and one of the World Food Prize 2024 Laureates.

Finally, the Crop Trust launched the first year of data collection under the newly developed impact framework and held an internal workshop on translating the impact indicators being developed as part of its impact framework into its communication projects to support future resource mobilization efforts.

COMMUNICATION & OUTREACH

In 2023 and the first half of 2024, the Crop Trust engaged target audiences and the general public across a variety of platforms. Building on the 2022 launch of the new website, the Crop Trust published news, stories, factsheets, multimedia content and project resources online, amplified by social media that encouraged conversation around crop diversity and our work. We continued to build the Crop Diversity Digest news platform, which features stories about Crop Trust work, our partners, and global efforts towards the conservation and use of crop diversity. The Digest served as a main platform for posting campaigns such as the Crop Chronicles that showcase the seven crops in focus for the BOLD project and the Seed Heroes stories about pioneers in the crop diversity space. The Crop Trust also continued to build engagement with key stakeholders through The Dish monthly newsletter. Both the Digest and the Dish were used to promote and highlight events held throughout the year, including the first Global Crop Diversity Summit.

Global Crop Diversity Summit

On 14 November 2023, the Crop Trust and the Plant Treaty hosted the first-ever Global Crop Diversity Summit. Held under the patronage of German Federal President Frank-Walter Steinmeier, this flagship event convened key stakeholders from around the world.[48] Over 250 people attended in person and the livestream reached more than 1,500 people.

The Summit marked a major milestone in the Crop Trust 2030 Strategic Plan and was held to:

- Draw political attention to the risk of losing crop diversity.
- Highlight opportunities for using this diversity.
- Emphasize the need for sustainable financing of genebanks.

The Summit also aimed to advance cooperation among genebanks in a Global Genebank Partnership. Diverse speakers represented all regions of the world and included high-level political representatives from Brazil, Colombia, Germany, Norway, and the United States. Panelists from NGOs, UN agencies and other organizations, youth representatives, chefs, and artists brought their voices and perspectives to the discussions.

A scientific background paper on "Empowering genebanks to transform agrifood systems"[49] informed the discussions. This paper underscores the urgent need to transform agrifood systems to address food insecurity, climate change, and biodiversity loss. It emphasizes the importance of empowering genebanks through sustainable funding and concludes with an urgent call for action in support of genebanks.

A Communiqué[50] shared at the Summit highlighted the key actions to safeguard future food security that governments and other donors should prioritize for support. The Communique was presented to the 10th Session of the Governing Body of the Plant Treaty in November in Rome, where several delegates lauded the event. It was also presented at COP28 in December in Dubai to highlight key findings on climate change mitigation and adaptation.

Other events

As per the policy guidance in past Governing Body resolutions, collaboration with the Treaty in 2023-2024 also included coordinated outreach efforts and events such as:

- Press releases and opinion pieces around each Svalbard deposit.[51]
- Joint GB-10[52] side event "Strengthening information-based decision-making in PGRFA management: relevance of Global Crop Conservation Strategies and the Plants that Feed the World projects to the International Treaty."
- Crop Diversity Day 2024 in Rabat, Morocco "Climate and Biodiversity: Towards Resilient Food Systems in the MENA Region."[53]

The Crop Trust will continue this collaboration, with a panel discussion planned at the CBD COP16[54] in Cali, Colombia on "Food Systems and Agrobiodiversity: An Intercultural Approach" featuring a Plant Treaty panelist and the Ministry of Agriculture and Rural Development of Colombia. We also look forward to collaborating with the Treaty at the WEF in 2025.

During the 2023-2024 period, the Crop Trust advanced engagement through other events that highlighted the value of conserving crop diversity and making it available for use:

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[48] https://www.croptrust.org/global-crop-diversity-summit/

[49] https://www.croptrust.org/global-crop-diversity-summit/background/

[50] https://www.croptrust.org/global-crop-diversity-summit/communique/

[51] https://www.croptrust.org/resources/ghana-genebank-becomes-100th-depositor-to-safeguard-food-crops-in-the-seed-vault/

[52] https://www.croptrust.org/news-events/events/10th-session-of-the-governing-body/

[53] https://www.croptrust.org/news-events/events/crop-diversity-day-rabat-2024/

[54] https://www.croptrust.org/news-events/events/un-biodiversity-conference-cop-16/

- Global Landscapes Forum (GLF) Live celebrated the signing of the Long-term Partnership Agreement with IITA.[55]
- Climate Week NYC event in collaboration with Bezos Earth Fund and One CGIAR[56] showcased "Unlocking Climate Solutions: Embracing Nature and Agricultural Heritage"
- GLF Live highlighted the Seeds for Resilience project.[57]
- GB10 joint side events were held with NordGen on "Svalbard Global Seed Vault: 15 years of safeguarding crop diversity" and with the CGIAR Genebank Initiative on "Capacity sharing projects to support the global system."[58]
- Executive Director Stefan Schmitz delivered a High-level Segment Statement at the UNFCCC COP28.[59]
- Other side events and speaking engagements at UNFCCC COP28 in UAE included:[60]
    - "Unleashing the Power of Crop Diversity for Climate Resilience" in collaboration with WWF and Alliance of Bioversity and CIAT.
    - "Crop Diversity for Climate Change Adaptation and Mitigation Contributing to Resilient and Nature Positive Futures for Farmers Globally" in collaboration with CIP CIMMYT, WWF and Alliance of Bioversity and CIAT.
    - "Global Commons for Climate-Resilient Future Generations: The case of Biodiversity" in partnership with UNFCCC Resilience Frontiers.
    - "Unleashing the Power of Crop Diversity for Climate Resilience" in partnership with WWF and Alliance of Bioversity and CIAT.
    - A Food Forever Experience in partnership with RGB Kew, One CGIAR, ICBA, Chefs' Manifesto and UNFCCC Resilience Frontiers.
    - Speaking roles by Executive Director Stefan Schmitz and Director of Programs Sarada Krishnan at sessions hosted by OPEC Fund and CGIAR Climate Impact Platform.
- A reception at the Old Town Hall of the City of Bonn commemorated the partnership with the City of Bonn.[61]
- A GLF Live collaboration celebrated the International Year of the Millets (IYOM).[62]
- A Global Forum for Food and Agriculture (GFFA) event with Julius-Kühn-Institute showcased "Crop Diversity for a Healthy Planet and Those Who Live on It".[63]
- Support of the German Plant Breeding Conference "Accelerating Crop Genetic Gain" and a session "Accelerating crop breeding for improved climate resilience and sustainability" highlighting achievements and lessons learned in the BOLD project.[64]
- Support of the International Lathyrus Day, hosted by the Fernand Lambein Fund.[65]

Digital engagement

We organize regular online Genebank Resources on the Web (GROW) webinars to tackle new, speculative and provocative issues related to the role of genebanks in the conservation and use of crop diversity:

1. Jayanthi Nadarajan from the New Zealand Institute for Plant and Food Research Limited presented "Seed storage behavior: what do we know now that we didn't know 50 years ago?" 15 May 2024.
2. Sean Hoban from the Morton Arboretum presented "Making *ex situ* plant conservation more effective: conserving genetic diversity using DNA as well as simple, affordable proxy metrics." 29 February 2024.

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[55] https://www.croptrust.org/news-events/events/glf-live-banking-on-our-future-with-seeds-1/
[56] https://www.croptrust.org/news-events/events/new-york-climate-week/
[57] https://www.croptrust.org/news-events/events/glf-live-how-can-we-safeguard-africas-crops/
[58] https://www.croptrust.org/news-events/events/10th-session-of-the-governing-body/
[59] https://youtu.be/uwRvQ_OJ_Q4?si=89CrqpmMxeTdcJyG
[60] https://www.croptrust.org/news-events/events/crop-trust-at-cop-28/

[61] https://www.croptrust.org/news-events/events/crop-trust-and-city-of-bonn-partnership-closing-event/
[62] https://www.croptrust.org/news-events/events/glf-live-year-of-the-millets/
[63] https://www.croptrust.org/news-events/events/crop-trust-at-gffa/
[64] https://www.croptrust.org/news-events/events/german-plant-breeding-conference-2024-accelerating-crop-genetic-gain/
[65] https://www.croptrust.org/news-events/events/international-lathyrus-day/

3. Tizina Ulian from Kew Gardens presented "Useful plants to develop bioeconomics." 26 October 2023.
4. David Ellis, emeritus scientist from the International Potato Center, presented "When is it good to be left out in the cold?" The Cryopreservation Initiative." 24 August 2023.
5. Carol Baskin from the University of Kentucky presented "Don't let seed dormancy be a headache: how to understand, classify and overcome it." June 28, 2023.
6. Michael Quinn, director of the CGIAR Excellence in Breeding Platform, presented "CGIAR Breeding - Who Benefits and How to Increase Those Benefits." 27 April 2023.
7. Patrick Stover, director of the Institute for Advancing Health through Agriculture, presented "Responsive Agriculture-what do we want from the food System?" 23 February 2023.

In 2023, the Crop Trust also co-hosted a webinar with the Crawford Fund to honor the late Tim Fischer, who had previously chaired both organizations. A former deputy prime minister of Australia, Fischer was a passionate advocate for food security and biodiversity conservation. Tim passed away in 2019 and his legacy will long endure.

In 2024, the Crop Trust launched the Crop Chronicles[66] as a podcast and short animation, adding new digital platforms for engagement. The Crop Chronicles tell the stories of our seven key BOLD crops in engaging ways. The podcast gives an in-depth auditory exploration of each crop's history and importance, while the short animation provides a quick at-a-glance overview that is optimized for sharing on social media.

Media and social media

Outreach in 2023 and 2024 resulted in significant exposure in the global media and engagement on social media. Coverage included major media outlets such as Forbes[67], Reuters for our work[68] and the Svalbard Global Seed Vault[69], the BBC[70], and PBS[71]. The Crop Trust was also featured in development news, including The Africa Report[72], Devex[73], and Foodtank[74].

Between August 2023 and August 2024, the Crop Trust saw significant gains in social media engagement. Our social media focuses on four main channels that allow for interactive conversation: Facebook, LinkedIn, X (formerly Twitter), and Instagram.

- Facebook[75] achieved remarkable reach with over 18 million impressions and nearly 600,000 link clicks. The platform added 4,831 new fans, with a high level of engagement reflected in over 270,000 reactions. It was also the platform generating the most clicks to the Crop Trust website. Video content on Facebook has the most potential for engagement and reach , with all three of our top performing posts in video format.

[66] https://bold.croptrust.org/crop-chronicles/
[67] https://www.croptrust.org/news-events/in-the-media/forbes-top-banana-americas-favorite-fruit-confronts-an-uncertain-future/
[68] https://www.croptrust.org/news-events/in-the-media/reuters-crop-trust-seeks-more-funding-to-protect-global-seed-diversity/
[69] https://www.croptrust.org/news-events/in-the-media/reuters-svalbards-doomsday-vault-gets-record-batch-of-global-crop-seeds/
[70] https://www.croptrust.org/news-events/in-the-media/bbc-news-ghana-deposits-seeds-in-arctic-circle-doomsday-vault/
[71] https://www.pbs.org/newshour/show/global-seed-vault-becomes-more-important-than-ever-as-climate-change-threatens-crops
[72] https://www.theafricareport.com/351359/opinion-safeguarding-africas-diverse-food-crop-seed-collections-against-climate-threats/
[73] https://www.croptrust.org/news-events/in-the-media/devex-how-genebanks-act-as-guardians-against-climate-uncertainty/
[74] https://www.croptrust.org/news-events/in-the-media/crop-trust-listed-in-the-124-food-and-agriculture-organizations-to-watch-in-2024/
[75] https://facebook.com/globalcropdiversitytrust

- LinkedIn[76] performed well with over 800,000 impressions and a notable 47,000 clicks. The platform saw strong growth with 5,903 new followers. This shows the professional audience's interest in Crop Trust content.
- Twitter[77] has shown solid engagement with nearly 1 million impressions and growing number of engagements. The platform gained 2,676 new followers and saw a high number of likes and reposts, indicating strong content resonance.
- Instagram[78] generated the highest number of impressions at 15.48 million, reflecting a significant reach. Despite a lower posting frequency, the platform maintained steady engagement with nearly 12,000 likes and added 2,432 new followers.
- This social media engagement supports a robust communications and outreach strategy that seeks to reach target audiences and highlight the Crop Trust's work to conserve crop diversity and make it available for use. Along with traditional media, digital engagement, event engagement and a strong online presence, the Crop Trust will continue to use communications to innovate across platforms, elevate our brand and assert our voice in the globa
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[76] https://linkedin.com/company/global-crop-diversity-trust
[77] https://twitter.com/CropTrust
[78] https://www.instagram.com/croptrust
[79] https://linkedin.com/company/global-crop-diversity-trust
[80] https://twitter.com/CropTrust
[81] https://www.instagram.com/croptrust

ANNEX 2

REPORT FROM THE GLOBAL FORUM ON AGRICULTURAL RESEARCH AND INNOVATION (GFAIR)

The Global Forum on Agricultural Research and Innovation (GFAR), recently rebranded as GFAiR, operates through various continental and regional platforms. These include six key regional agricultural research fora, which play a crucial role in facilitating GFAR's mission:
FARA (Forum for Agricultural Research in Africa) - Covers Africa; AARINENA (Association of Agricultural Research Institutions in the Near East and North Africa) - Focuses on the Near East and North Africa; APAARI (Asia-Pacific Association of Agricultural Research Institutions) - Represents the Asia-Pacific region; CACAARI (Central Asia and the Caucasus Association of Agricultural Research Institutions) - Covers Central Asia and the Caucasus; EFARD (European Forum for Agricultural Research and Development); FORAGRO (Forum of the Americas for Agricultural Research and Technology Development) - Supports Latin America and the Caribbean.

It is crucial for GFAiR to promote research on Plant Genetic Resources for Food and Agriculture (PGRFA) through its Collective Actions and the Global NARS (National Agricultural Research Systems) Consortium (GNC) because these resources form the foundation of global food security. Plant genetic diversity is essential for breeding new crop varieties that are resilient to climate change, pests, and diseases. By supporting research and the conservation of diverse plant species, GFAiR enables innovations that can address the growing challenges of feeding an increasing global population. Moreover, plant genetic resources are critical for enhancing the nutritional value of crops, which is key to combating malnutrition and achieving Sustainable Development Goals (SDG), particularly Target 2.5 that focuses on maintaining genetic diversity in crops[82].

Furthermore, GFAiR's role in fostering collaboration through the Global NARS Consortium (GNC) ensures that research efforts on PGRFA are shared globally, avoiding duplication and promoting knowledge exchange across regions. This collaboration is vital for addressing region-specific agricultural challenges while pooling genetic resources from diverse environments to enhance global resilience. By promoting the equitable sharing of benefits derived from PGRFA, GFAiR supports both innovation and fairness, helping countries develop local solutions that contribute to global food systems. This also aligns with the objectives of international frameworks like the FAO's Global Plan of Action for PGRFA, enhancing the sustainability and impact of agricultural practices worldwide.

Several research initiatives across the various fora contribute to the conservation and sustainable use of plant genetic resources, supporting the objectives of the FAO's Commission on Genetic Resources for Food and Agriculture.

1) Research conducted by the Regional Fora

Here are examples of research from each regional agricultural research forum[83], that contribute to plant genetic resources for food and agriculture (PGRFA), aligning with the objectives of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture, such as conservation, sustainable use, and benefit-sharing[84]:

[82] CGIAR’s Alliance to host GFAR through new agreement
[83] GFAR scales out Transformational Learning to another continent
[84] GFAR Collective Action on Inclusive Digital Transformation of Agriculture

1. FARA (Forum for Agricultural Research in Africa):

Development and Conservation of African Orphan Crops

FARA supports research on the conservation and breeding of **orphan crops**, such as teff, finger millet, and sorghum, which are crucial for food security in Africa. These crops are often neglected in mainstream agricultural research. By conserving their genetic diversity and improving their resilience to climate change, FARA contributes to safeguarding Africa's genetic resources. This research aligns with the Working Group's emphasis on the **sustainable use of plant genetic resources** for food and agriculture.

2. AARINENA (Association of Agricultural Research Institutions in the Near East and North Africa):

Date Palm Genetic Resources Conservation In the Near East and North Africa, AARINENA has been involved in **conserving and improving the genetic diversity of date palms**, a vital crop in arid regions. Research focuses on identifying and preserving diverse date palm varieties, improving their resistance to pests and diseases, and enhancing yield. This work is directly relevant to the sustainable use of PGRFA, particularly for arid and semi-arid ecosystems.

3. APAARI (Asia-Pacific Association of Agricultural Research Institutions):
Rice Genetic Diversity Conservation APAARI has undertaken projects on the **conservation and use of rice genetic resources**, which are critical for food security in the Asia-Pacific region. The research includes cataloging traditional rice varieties and developing climate-resilient strains. This aligns with the Commission's work on maintaining biodiversity and the **Second Global Plan of Action for PGRFA**, ensuring rice's adaptability to changing environmental conditions.

Global Plan of Action for PGR with FAO
APAARI played a key role in the regional consultation for the Second Global Plan of Action for Plant Genetic Resources, co-hosted with FAO in July 2024. By facilitating collaboration among national agricultural research institutions, APAARI enhances knowledge sharing and addresses plant genetic resource challenges. Its capacity development efforts support sustainable management and align regional perspectives with global discussions, contributing to SDGs focused on food security and sustainable agriculture.

Gene Editing for Sustainable Agriculture
In partnership with Korea Biosafety Clearing House (KBCH) and Biotech Consortium India Limited (BCIL), APAARI advanced gene editing technology in the Asia-Pacific region through webinars in 2021 that engaged over 2,500 participants. These discussions emphasized the need for harmonized regulations and led to the creation of a Resource Document on Gene Editing. This document highlights CRISPR's potential to improve crop resilience and food security, advocating for policy collaboration to facilitate the adoption of gene-edited products.

Forgotten Foods Initiative
APAARI has led the Collective Action on Forgotten Foods since 2020, establishing a framework for research and policy support. Through consultations and workshops, APAARI promotes the sustainable use of underutilized crop genetic resources, raising awareness of their importance for achieving SDGs. Ongoing work is likely to culminate in a 2024 collective action plan for India, Sri Lanka, and Bangladesh, aiming to create a collective action plan for co-creating knowledge and promoting public-private partnerships to conserve forgotten foods.

Millet Foundation Guide
The Millet Foundation Guide, developed by the Government of Odisha, India in collaboration with and guidance by APAARI, highlights the health and environmental benefits of millets. It underscores millets' role in addressing food security and climate change, providing clear insights for various stakeholders. The guide was featured at the International Convention on Millets in November 2023, emphasizing its importance in promoting millet varietal diversity.

4. **CACAARI (Central Asia and the Caucasus Association of Agricultural Research Institutions):**

The Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI) plays an important role in advancing agricultural research and innovation within its region. Its mission is to serve as a neutral forum where various stakeholders of agricultural research for development in Central Asia and the Caucasus can discuss and debate issues critical to the agriculture of the future.

In the context of Plant Genetic Resources for Food and Agriculture (PGRFA), CACAARI's contributions are significant:

- **Conservation of Wild Fruit Trees:** CACAARI has focused on preserving wild fruit tree species, such as wild apple and apricot, which are vital genetic resources for breeding programs aimed at enhancing fruit production and resistance to pests and diseases. This research directly contributes to the conservation of plant genetic resources, particularly in the context of climate change adaptation and the preservation of wild relatives of domesticated crops. (it is in the paper, already)

- **Regional Collaboration:** By facilitating collaboration among national agricultural research institutions, CACAARI enhances knowledge sharing and addresses plant genetic resource challenges. Its capacity development efforts support sustainable management and align regional perspectives with global discussions, contributing to Sustainable Development Goals focused on food security and sustainable agriculture.

- **Policy Advocacy:** CACAARI engages in policy advocacy to promote the conservation and sustainable use of PGRFA, ensuring that regional agricultural policies align with international frameworks like the FAO's Global Plan of Action for PGRFA. This alignment enhances the sustainability and impact of agricultural practices worldwide.

CACAARI's (Central Asia and the Caucasus Association of Agricultural Research Institutions), as well as other regional fora, Potential Contribution to PGRFA, are as follows:

CACAARI can play a significant role in advancing the objectives of Plant Genetic Resources for Food and Agriculture (PGRFA) conservation and sustainable use, as outlined in the GFAiR's mission:

1. **Conservation of Unique Genetic Resources**: CACAARI can focus on the conservation of vital genetic resources, such as wild fruit tree species, including wild apple and apricot. These resources are essential for breeding programs that aim to enhance crop resilience to pests, diseases, and climate change, contributing to biodiversity conservation and sustainable agriculture.
2. **Facilitating Regional Collaboration for Knowledge Exchange**: CACAARI is positioned to strengthen collaboration among national agricultural research institutions across Central Asia and the Caucasus. By facilitating networks for knowledge and practice exchange, CACAARI can contribute to coordinated efforts for the effective conservation and use of plant genetic resources.
3. **Capacity Building and Training Initiatives**: CACAARI can organize specialized training programs to build local expertise in managing genetic resources sustainably. These programs can cover topics such as genebank management, advanced biotechnological tools, and data analysis, equipping researchers and agricultural professionals with the necessary skills to contribute effectively to PGRFA conservation.
4. **Policy Advocacy and Support**: CACAARI can advocate for the integration of PGRFA conservation strategies into national and regional policies. This effort will help align local practices with international standards, such as the FAO's Global Plan of Action for PGRFA, ensuring sustainability and effective policy implementation.
5. **Promoting Climate-Resilient Agriculture**: CACAARI can emphasize research on climate-resilient crop varieties to address environmental challenges specific to the region, such as drought and

extreme temperatures. Promoting these crops will contribute to the development of agricultural systems that maintain productivity despite climate variability.

6. **Community Engagement and Public Awareness**: CACAARI can spearhead outreach programs aimed at raising public awareness and engaging farmers and communities in the importance of conserving plant genetic resources. These activities would foster the adoption of sustainable farming practices and ensure that conservation efforts are community-inclusive.
7. **Support for Underutilized and Indigenous Crops**: CACAARI can promote the use and conservation of underutilized and indigenous crops, which are often overlooked but hold significant potential for diversifying agricultural systems and enhancing food security. These crops contribute unique traits that can strengthen agricultural resilience.

5. FORAGRO (Forum of the Americas for Agricultural Research and Technology Development):

Conservation of Native Maize Varieties

FORAGRO has been actively involved in projects for the **conservation of native maize varieties** in Latin America. These varieties, essential for food security and cultural heritage, are conserved in both in situ and ex situ gene banks. This research supports the fair and equitable sharing of genetic resources, providing genetic material for future breeding programs, and is critical to the Working Group’s focus on **genebank standards and the sustainable use of PGRFA**.

6. EFARD (European Forum for Agricultural Research and Development):

European private sector and academic stakeholders, many of which are members of/ affiliated to EFARD, are intensively involved in research on plant genetic resources in agriculture. Efforts are focused on European crops (e.g., conserving traditional landraces of cereals and improving their resilience to new environmental stresses like drought and diseases), as well as on crops of importance in other global regions in close collaboration with their partners and stakeholders from the global South.. This aligns with the Working Group’s objectives to enhance the sustainable use of plant genetic resources and support the goals of **SDG Target 2.5**, which focuses on maintaining the genetic diversity of seeds and plants.

Conclusion

Research projects on Plant Genetic Resources for Food and Agriculture (PGRFA) can provide critical insights for the **Commission on Genetic Resources for Food and Agriculture** by highlighting the current state of genetic diversity, identifying key areas for conservation, and suggesting improvements in the sustainable use of these resources. These projects generate data on genetic traits, crop resilience, and the impact of environmental stressors like climate change. By reviewing the outcomes of such research, the Commission can develop more informed policies to ensure the conservation of plant genetic resources and the equitable sharing of their benefits. This aligns with global efforts like the **Second Global Plan of Action for PGRFA** and helps assess progress toward achieving targets like SDG 2.5, which emphasizes preserving agricultural biodiversity. Research findings can also guide the development of practical tools, such as genebank standards and seed policy frameworks, that enhance the use and storage of genetic resources.
These research initiatives also **inform funding partners’ policies** by identifying areas where investment can yield the highest impact in terms of global food security, sustainability, and climate resilience. For instance, research demonstrating the importance of preserving orphan crops or wild relatives of major food crops can encourage funders to support projects that focus on conserving these underutilized genetic resources. Additionally, research on seed systems, regulatory frameworks, and community-based conservation practices can shape funding priorities, ensuring that investments promote inclusive and sustainable agricultural development. By aligning funding with the needs identified through PGRFA research, these projects help ensure that financial resources are directed toward initiatives that not only enhance genetic diversity but also support equitable and sustainable agricultural innovation. 5

The promotion of Plant Genetic Resources for Food and Agriculture (PGRFA) research is highly significant for agroecology research and the DeSIRA program (Development Smart Innovation through Research in Agriculture)[85] under INTPA(International Partnerships of the European Commission). Agroecology emphasizes biodiversity, ecosystem health, and the use of natural resources in a sustainable manner, which closely aligns with the conservation and sustainable use of plant genetic diversity. Research on PGRFA underpins agroecology by providing the genetic base for crops that are resilient to local environmental conditions, support diverse ecosystems, and reduce dependency on external inputs like synthetic fertilizers and pesticides. Such research helps agroecological systems thrive, as it promotes the use of crop varieties that are adaptable, culturally relevant, and sustainable in diverse farming environments, contributing to climate resilience and food security.

[85] GFAiR receives its core funding from the INTPA/DeSIRA+ program

ANNEX 3

REPORT FROM THE INTERNATIONL SEED FEDERATION (ISF)

ISF, the International Seed Federation, is an international non-profit organization that is the voice of the private seed industry representing more than 7500 seed companies around the world. In a letter dated September 30, 2024, the Deputy Director-General of FAO, Ms Beth Bechdol, addressed an invitation to ISF to provide a report on its activities related to plant genetic resources for food and agriculture (PGRFA) for the Twelfth Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture of the Commission on Plant Genetic Resources for Food and Agriculture. As in previous years, ISF is glad to provide information on its activities in relation to PGRFA. In the present report, we elaborate on the three topics listed below linked to the implementation of the Second Global Plan of Action (GPA) and the Sustainable Development Goals:

1. **CONSERVATION, SUSTAINABLE USE AND ACCESS AND BENEFIT SHARING**
2. **SEED POLICIES**
3. **CLIMATE CHANGE AND PGRFA**

In addition, we provide our thoughts on other matters covered in the agenda of the Working Group meeting.

CONSERVATION, SUSTAINABLE USE AND ACCESS AND BENEFIT SHARING

The basics of plant breeding

It is a well-known fact that plant breeding is essentially the recombination of existing genetics into new combinations of characteristics which respond better to the ever-changing environmental challenges and needs of society. In their daily work, plant breeders therefore screen for interesting characteristics and recombine plant genetic resources with the aim of arriving to the desired combination of characteristics that can become a new and better adapted commercial variety. This means that plant breeders need access to diverse materials to (i) use PGRFA in a sustainable manner that supports their conservation; (ii) characterize PGRFA traits by phenotype and genotype and, (iii) characterize performance of varieties in farmer conditions.

Plant breeders give crucial importance to the conservation of PGRFA

Given that PGRs are the basics of plant breeding, it is very important for ISF members that they are properly conserved. Many breeding and seed companies maintain their own collections which practically means that seeds or material of different genetic resources that the company acquired, received or otherwise collected throughout its years of existence as well as samples of the company´s own crossing lines, are maintained and conserved future use in breeding programs. Besides having their own collections, breeders also support the conservation of genetic resources in public gene banks. This support can be in the form of direct financial support, and most often, companies provide in-kind services to gene banks, which means that they receive material from the gene bank and regenerate it for the gene bank. Companies thus use their own assets (land, facilities, and workforce) for planting the seeds of the gene bank material and growing the plants; and they provide the seeds back to the gene bank. Seed companies also participate in public-private partnerships to evaluate and characterize gene bank material, thereby contributing to the efforts of the gene bank to make the material more interesting for all users. A few examples of in-kind support activities to gene banks can be found in the Annex to this report.

Plant breeders use PGRFA in a sustainable manner

The Convention on Biological Diversity (CBD) states that "Sustainable use" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity. Use of PGRFA as input for plant breeding is sustainable use by definition in the International Treaty on Plant Genetic Resources for Food and Agriculture (the Treaty). In breeding programs, the genetic resources that are conserved *in situ* or *ex situ*, are being effectively used (in opposition of just being conserved but not used at all) by combining existing and creating new variation. As a result, the genetic resources used in breeding are being conserved since they are recombined into new and unique combinations of characteristics. Developing and commercializing new varieties intrinsically comprises characterization of varieties and traits

(GPA 8), plant breeding and genetic enhancement (GPA 9), development, commercialization (GPA 11), production and distribution (GPA 12). The seed industry also contributes to information systems (GPA 15), build human resource capacity (GPA 17), and it promotes public awareness (GPS 18).

Plant breeders need access to the widest possible genetic pool

Since genetic resources are the basis for any plant breeding activity, for breeders it is essential that the step between conservation and sustainable use is facilitated by a fair framework that provides for access to the genetic resources. This is a very important bottleneck and much of the work that ISF does in relation to genetic resources at the international level relates to the ongoing international discussions on access and benefit sharing frameworks. In that vein, ISF has always been closely following the international discussions both in the CBD and the International Treaty and has expressed its preference for the ABS system of the Treaty which – with its multilateral approach – responds better to the needs of plant breeding than the bilateral approach followed by the CBD.

ISF has been closely involved in the enhancement process of the Multilateral System (MLS) of the Treaty since 2013. This process was launched by the Governing Body of the Treaty to develop a range of measures to increase user-based payments and contributions to the Benefit-sharing Fund in a sustainable, predictable, and long-term manner and that will enhance the functioning of the Multilateral System also by other measures.

ISF fully supports the objectives of the Treaty, being the conservation and sustainable use of PGRFA and the equitable sharing of benefits arising from their use. In line with those objectives, since the very beginning of this enhancement process, ISF has always underlined that with the enhancement of the benefit sharing system. We also stress that access needs to be improved for the enhancement process to be fully realized. Therefore, an enhancement of the MLS, whereby more material is made available through the new system that includes a SMTA that is more attractive for companies (see below), would be opportune. Consequently, one of ISF's main asks in the enhancement process has been the expansion of the Annex I to all PGRFA and a better implementation of the system by Contracting Parties.

Concerning the revision of the SMTA, and in particular the efforts to improve the benefit sharing modalities to bring more, predictable and sustainable, long-term income, ISF has recognizes that the current mechanism could be enhanced. While it does provide for a payment mechanism for use-based income, Parties must recognize that the development time of a new variety takes several years. This explains the fact that use-based payments only started to flow into the Benefit Sharing Fund in the past 3-5 years.

Nevertheless, the system works since several seed companies are now paying their mandatory monetary benefit sharing on an annual basis (more information can be found about the use-based payments made to the Benefit Sharing Fund here: The Benefit-sharing Fund: 2022–2023 report). As regards the increasing payments, ISF supports making Article 6.8 payments mandatory (at a reduced rate) as well as a subscription model that simplifies the administrative burdens, removes time lag of benefit sharing, creates legal certainty, and creates more predictable income. ISF asks for a system that is flexible enough to take into account the diversity of plant breeding, the wide range of crops, business profitability and investment approaches. Payment mechanisms need to consider the diversity of users and their needs in accessing and using genetic resources and associated information. Further on, the future MLS should be attractive for users, providing payment obligations that are realistic and proportionate to the actual value derived from MLS material incorporated into crops sold commercially.

Digital Sequence Information

In the recent years the international discussions on the need to set up a framework for benefit sharing on the use of digital sequence information (DSI) has made the discussions more complex both at the level of the CBD and the Treaty. The use of DSI in research and development is strongly linked to the associated physical genetic resources. Introducing a distinct regulatory framework for benefit-sharing resulting from the use of DSI will further increase complexity and costs for research and development. For plant breeding, it is particularly true that the exclusive use of DSI for the development of a new variety does not occur in practice. In the creation of new crop varieties, plant genetic resources, *i.e.*, seeds, are indispensable to the breeding process, whereas DSI is primarily a research tool. A wide range of DSI might be accessed, generated, and used for a variety of purposes, and each breeding cycle may use different DSI. Genetic sequencing enables the breeding process, by improving its quality, accuracy and speed. Therefore, DSI is neither a commercial product on its own, nor an integral component of the final products that could lead to monetary benefits. This is why ISF remains of the view that establishing benefit sharing obligations for the use of DSI is not useful. If the benefit sharing is triggered by specific DSI access, use, or commercial products derived from specific DSI, it is also not realistic and would hinder progress to achieve the overall objectives of CBD.

Mutually supportive implementation

Given that seed companies are using PGRs as well as other types of genetic resources (such as insects, bacteria, fungi for screening susceptibility etc.) in their breeding activities, even if the Annex I of the Treaty gets expanded to all PGRFA, breeders will have to continue working with both legal frameworks. It is therefore of key importance that the two international frameworks are implemented in a mutually supportive manner and do not result in stacking obligations.

ISF believes that with its activities highlighted in this section, it contributes to the implementation of some of the priority actions of the Second Global Plan of Action (GPA) related to *ex situ* conservation and sustainable use of PGRFA (such as (i) sustaining and expanding *ex situ* conservation of germplasm; (ii) regenerating and multiplying ex situ accessions; (iii) expanding the characterization, evaluation and further development of specific subsets of collections to facilitate use). These activities are equally contributing to implementing SDG 2.5 and 2.a. on maintaining the genetic diversity of seeds and implementing obligations stemming from the internationally agreed access and benefit sharing frameworks.

SEED POLICIES

Two actions under the 2nd GPA are (i) promoting development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized species and (ii) supporting seed production and distribution.

ISF's vision is a world where the best quality seed is accessible to all, supporting sustainable agriculture and food security. To implement this objective, ISF – amongst many other actions – has been engaged in several collaborative initiatives aimed at developing local seed sectors and building up or strengthening seed distribution channels especially in developing countries. One of the pillars such initiatives are working on is the strengthening of the policy and legal framework allowing for the complementary existence of formal and informal seed systems and ensuring that farmers can rely on these complementary channels to source their seeds. At the same time strengthening the regulatory and policy framework can also contribute to creating an environment where more investment can be attracted to such countries and the choice of varieties to farmers can also be increased. We believe that the Commission should explicitly recognize the value of these efforts.

Some of the initiatives ISF is involved in are (i) a public-private partnership between ISF and CGIAR; (ii) ISF's own Seed Resilience Project in Rwanda; (iii) the World Seed Partnership; (iv) a joint initiative between ISTA-G7-ISF and (v) the Seeds for Food Coalition. The following paragraphs provide more information about these initiatives:

(I) PUBLIC-PRIVATE PARTNERSHIP BETWEEN ISF &CGIAR

In 2023 ISF signed a Memorandum of Understanding with the CGIAR with the view of building a framework for collaboration and cooperation to engage in activities aimed to improve farmers' access to quality seeds and innovation. Through this partnership, the partners commit to achieve the mentioned goals through a range of collaborative activities categorized in four defined clusters: (i) develop a common understanding of the seed regulatory and policy frameworks; (ii) explore opportunities to create and maintain a common communication platform to support stewardship and compliance; (iii) facilitate partnerships on improving seed delivery to smallholder farmers within commonly identified regions; (iv) design innovative models for capacity building of the local and regional seed producers and farmers. A few activities for the implementation of the partnership have already been started.

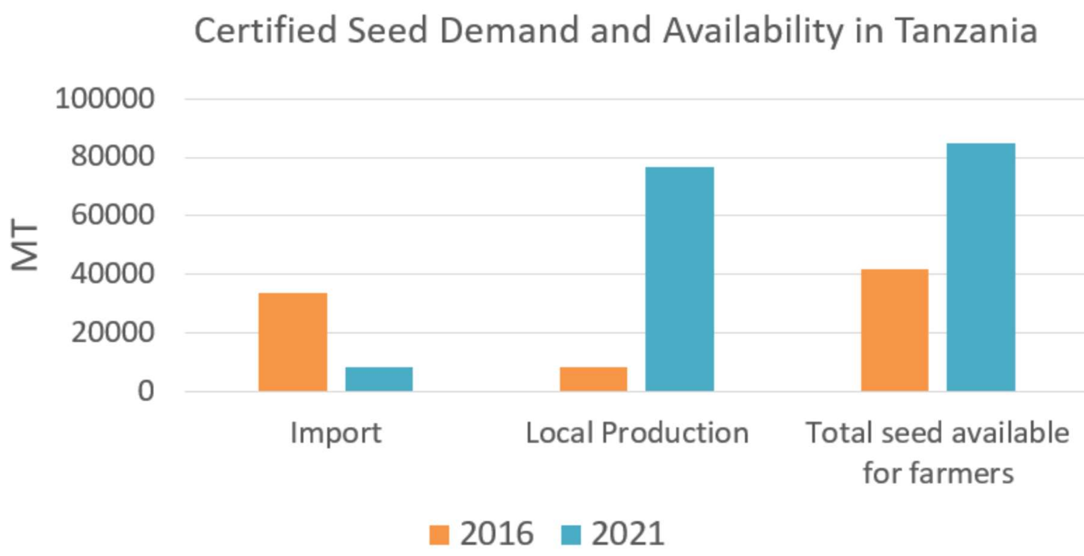
(II) ISF SEED RESILIENCE PROJECT IN RWANDA

In 2023 ISF also launched its own seed resilience project in Rwanda: "harnessing quality seeds for nutrition security in Rwanda". The project is mainly executed by the NGO Fair Planet in close collaboration with a number of local public sector partners in Rwanda. The project is globally aimed at reinforcing the private seed sector in Rwanda and developing a sustainable seed system allowing Rwandan farmers to access quality seeds. The project has three pillars that will be gradually developed: (i) the farmer level pillar, which is aimed at providing access to quality seeds, knowledge and skills to farmers; (ii) the value chain level pillar which will focus on the supply of and access (financially) to quality seed for farmers; and (iii) the policy level pillar which will look at developing an enabling policy and legal environment to guide and structure seed systems activities. The farmer level pillar is based on the concept of demonstration trials where several varieties are grown next to each other and farmers can chose the ones that they feel fits the best their needs. The project is focusing on potatoes and several vegetable crops in the trials traditional, local and commercial (foreign) varieties are equally included to provide farmers with the widest possible choice. Several ISF members contribute to the project both financially and by providing their commercial varieties for the trials. More information is available here: https://worldseed.org/about/what-we-do/seed-resilience-project-rwanda/.

(III) WORLD SEED PARTNERSHIP

The World Seed Partnership (WSP) is a collaboration between OECD (the Organization for Economic Cooperation and Development), UPOV (the International Union for the Protection of New Varieties of Plants), ISTA (the International Seed Testing Agency), ISF and the WFO (World Farmers' Organization). The WSP supports countries by providing guidance on policies and regulatory frameworks towards achieving food security and economic development in the agricultural sector. By enabling farmers to have access to high-quality seeds of new plant varieties, it supports sustainable agriculture, and it also aims at providing a platform for communication, information and coordinated actions between the five partner organization. A joint paper that summarizes the benefits of the WSP for farmers is available here: http://www.worldseedpartnership.org/world-seed-partnership-statement-april-2020.pdf and more information on the WSP is available here: http://www.worldseedpartnership.org

The United Republic of Tanzania was the first country to benefit from the WSP initiative. It is now a member of UPOV, it has a national seed testing laboratory accredited by ISTA, it is a member of the OECD Seed Schemes, and it has strong national seed and farmers' associations in place. The quantity of locally produced certified seeds in Tanzania increased by 910% and those made available to farmers more than doubled within a period of 5 years.

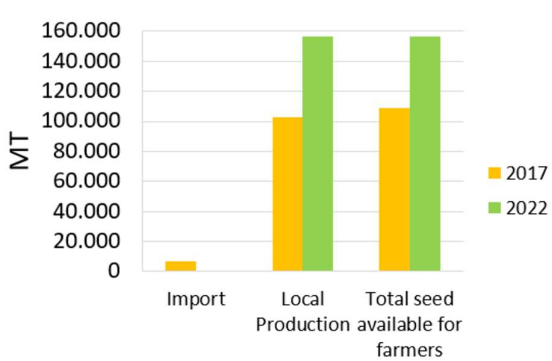


(IV) ISF – OECD SEED SCHEMES CAPACITY BUILDING PROJECT IN AFRICA

The OECD Secretariat together with ISF conceived a capacity building cooperation project with the aim of providing training and technical assistance to official inspectors, seed farmers, seed companies and their employees and other relevant stakeholders in Africa with regard to the implementation of the OECD seed schemes and the establishment of a seed certification system. For the 5 years initiative a train the trainers program is foreseen aimed at training the future seed certification trainers for Africa; in-country trainings for 12 African countries with follow-up and impact assessment and the provision of a learning platform with digitalized training resources, e-learning tool etc.

To give an example of how this can work, Zambia joined the OECD Seed Schemes in 2017 and benefitted from a similar capacity building training which resulted in an increase of local production of certified seeds and total seeds available to farmers, as well as in a decrease of illegal seeds on the market from 1.92 MT per year in 2017 to 0.015 MT in 2022.

Certified Seed Demand and Availability for major crops in Zambia



Source: Seed Control and Certification Institute (SCCI), Zambia, 2023

(V) SEEDS FOR FOOD COALITION

As a follow-up to a number of discussions in preparation for and during the UN Food Systems Summit, the Seeds for Food Coalition was formed as a coalition of individuals and organizations from public and private sector. The Coalition aims to achieve seed security for farmers, a vibrant and inclusive seed sector and sustainable and equitable food systems transformation. To achieve its goals, the Coalition works on the following focus areas: (i) facilitation of discussion framework and platforms for constructive and inclusive dialogues; (ii) enhancement of seed value chains through synergies in technological and institutional innovations; (iii) facilitation of advocacy, public engagement and communications; (iv) pursuing enabling regulatory environment and policies and helping to ensure that these are implemented in an effective manner; and (v) supporting farmers' seed resilience to anticipate and plan for disaster risk reduction and management in the context of climate change. The Coalition is currently working with Malawi, Zimbabwe and Mozambique to elaborate action plans to work on one or more of the mentioned focus areas in those countries. More information is available here: https://worldseed.org/document/seeds-for-food-coalition/

ISF is of the view that through these initiatives we can get one step closer to a world where the best quality seed is available to all farmers. We believe that these initiatives not only contribute to the implementation of the abovementioned actions of the 2nd GPA but they also deliver on SDG 2.4 by contributing to ensuring sustainable food production systems and implementing resilient agricultural practices that increase productivity and production.

CLIMATE CHANGE, PGRFA AND PLANT BREEDING

Although it is rather self-explanatory, it is worthwhile to note that seed companies, members of ISF, work with PGRFA on a daily basis with the goal of breeding new varieties that are better adapted to the changing climate, provide solutions to farmers which allow for more sustainable practices (such as low input varieties) and varieties that can yield more without taking up more space thereby feeding more people and conserving biodiversity areas at the same time, and which respond better to societal and consumer needs. By their daily activities seed companies thus work towards the goals defined by SDGs 2.1 and 2.3 which are aiming at ending hunger and doubling agricultural productivity by 2030. The seed sector also contributes to SDG 2.a on investment in agricultural research, and technology; SDG 13.1. helping farmers and the food sector to achieve resilience to climate hazards; SDG 15.6 on benefit sharing; SDG 15.8. since plant pests can be seen as invasive species or races, with major impact and SDG 15 because the seed sector helps to optimize the footprint of agriculture on life on land.

Annex

Examples of Seed Sector Activities Supporting Gene Banks

<u>Support to maintaining plant genetic resources in public ex situ collections</u>

Bayer Crop Science provides on-going in-kind support, in the form of yield trials, nursery resources, plant testing, and expertise critical to maintain plant genetic resources in public gene banks, by conducting seed increases for hundreds of accessions annually for crops including cauliflower, cucumber, eggplant, lettuce, maize, melon, pepper, spinach, tomato and watermelon. These increases are performed at the request of the Centre for Genetic Resources of the Netherlands (CGN), French National Research Institute for Agriculture, Food and Environment (INRAE), the United States Department of Agriculture National Plant Germplasm System (USDA-NPGS) and USDA-GEM. For many of these crops, support has been consistently provided for over 10 years, and participation in USDA-GEM lasts for over 25 years. Since 2022, Bayer is engaging with World Vegetable Center in Taiwan, providing in-kind support with vegetable germplasm rescue and conservation.

<u>Support to National Plant Genetic Resources Laboratory</u>

East West Seeds has a 5-year Memorandum of Understanding with the National Plant Genetic Resources Laboratory (NPGRL)-Institute of Plant Breeding (IPB) in the Philippines to collaborate on crop germplasm conservation, research and training. Within this collaboration the old seed collections of NPGRL are revived at East West Seed Company Quarantine Facility, free of cost. There are more than1000 accessions of Philippine vegetable crops that have been received and regenerated and the seeds produced were submitted to NPGRL annually.

<u>Vegetable Genebank Indonesia</u>

East West Seeds in Indonesia in collaboration with Universitas Gadjah Mada (UGM), a public research university, established a Vegetable Genebank in August 2018. The gene bank is assisted by East West Seed Indonesia for ex situ conservation of vegetable genetic resources and is expected to become the center for research and development of vegetables in Indonesia. The gene bank development is one step to conserve and maintain Indonesia's vegetable germplasm from genetic erosion.

Partnership with CGN, Netherlands

East-West Seed Company through its R&D department has forged partnership with CGN-WUR, in the Netherlands in the areas of 'Crop germplasm regeneration, characterization and collecting missions'. The aim is to assist the CGN genebank in addressing its regeneration backlog and to harness the capability of the private seed organizations as partners in germplasm conservation. In July 2022, East-West Seed received 199 eggplant materials from the CGN collections for regeneration in its farm station in the Philippines; 65 accessions were already planted and undergoing processing for shipment to CGN, the rest are scheduled for planting within this year.

Input in kind to CGN

Dutch breeders contribute approximately 10-15 % of the budget of the Dutch gene bank CGN (Centre for Genetic Resources). They do this by:

- Taking care of seed multiplication, on the basis of protocols provided by CGN (Centre for Genetic Resources), for various vegetable species, like lettuce, spinach, allium species, peas, faba bean and for field crops like maize
- Evaluating parts of the CGN collection to create more knowledge on the genetic resources, in particular with regard to abiotic and biotic stress; this allows users to make more optimal use of the genetic resources.

Several breeding companies have signed collaboration agreements with the Dutch gene bank CGN to formalize the outlined collaboration and their intention to continue this collaboration in the future.

Support to World Vegetable Center

In-kind contribution to disaster seed kits

Seed companies have collaborated with the Center to prepare and distribute seed kits after disasters. For example, 8 companies provided seed to survivors of the December 2004 tsunami in Indonesia and Sri Lanka. In 2014, East-West Seed Indonesia provided 10,000 seed kits to people affected by volcanic eruptions in East Java and North.

Technical input

The Asia & Pacific Seed Association (APSA) closely collaborates with the World Vegetable Centre. For APSA members, the cooperation provides early and priority access to research and development results, the chance to interact directly with World Vegetable Centre staff at workshops; and preferential rates for germplasm and breeding lines. Some APSA companies, have sent their staff to the Centre for short-term training.

The World Vegetable Centre's main benefits are the funding provided; the opportunity to better align the Centre's work with pertinent issues identified by the private sector; and the opportunity to utilize APSA's network to disseminate the Centre's international public goods. APSA also helps expand the Centre's gene bank collection by sharing lines with interesting horticultural characteristics.

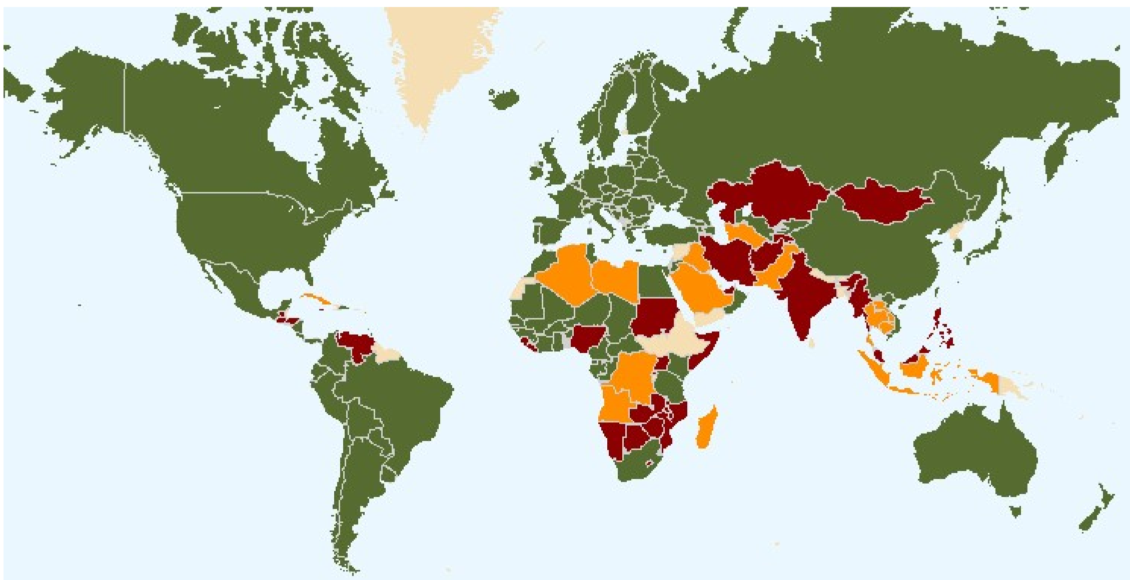
25 seed companies participate in an on-going World Vegetable Center-led project to evaluate a set of tomato lines representing different gene combinations for resistance to tomato yellow leaf curl diseases (TYLCD). Participating companies establish field trials in disease hotspots and evaluate TYLCD incidence and severity. Seed companies have also contributed technical support in varietal trials in Africa.

ANNEX 4

REPORT FROM THE INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

I. INTRODUCTION

The International Union for the Protection of New Varieties of Plants (UPOV) was established in 1961 by the International Convention for the Protection of New Varieties of Plants (UPOV Convention). The mission of UPOV is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society. As of November 5, 2024, UPOV has 79 members (shown in green). Eighteen States and 1 intergovernmental organization have initiated the procedure for acceding to the UPOV Convention (shown in brown), and 25 States and one intergovernmental organization have been in contact with the Office of the Union for assistance in the development of laws based on the UPOV Convention (shown in orange):



The boundaries shown on this map do not imply the expression of any opinion whatsoever on the part of UPOV concerning the legal status of any country or territory.

Details are provided in the Annex to this report and in the list of UPOV members available at http://www.upov.int/members/en/.

The UPOV Convention provides the basis for members to encourage plant breeding by granting breeders of new plant varieties an intellectual property right: the breeder's right (see http://www.upov.int/upovlex/en/upov_convention.html).

The UPOV Convention specifies the acts that require the breeder's authorization in respect of the propagating material of a protected variety and, under certain conditions, in respect of the harvested material. UPOV members may also decide to extend protection to products made directly from harvested material, under certain conditions.

In order to obtain protection, the breeder needs to file individual applications with the authorities of UPOV members entrusted with the task of granting breeders' rights. The directory of the PVP Offices of the UPOV members is available at http://www.upov.int/members/en/pvp_offices.html. UPOV has developed UPOV PRISMA, an on-line tool to assist with plant variety protection (PVP) applications in participating UPOV members. At the time of this report, 36 UPOV members participated in

UPOV PRISMA, including the European Union and the African Intellectual Property Organization. More information on UPOV PRISMA can be found at https://www.upov.int/upovprisma/en/index.html.

A State or intergovernmental organization that wishes to become a UPOV member needs to seek the advice of the UPOV Council in respect of the conformity of its laws with the provisions of UPOV Convention. This procedure leads, in itself, to a high degree of harmony in those laws, thus facilitating cooperation between members in the implementation of the system. Guidance documents on how to develop legislation and become a UPOV member can be found at http://www.upov.int/upov_collection/en/. The legislation of UPOV members can be consulted in UPOV Lex at http://www.upov.int/upovlex/en/.

The main objectives of UPOV are, in accordance with the UPOV Convention, to:

- provide and develop the legal, administrative and technical basis for international cooperation in plant variety protection;
- assist States and organizations in the development of legislation and the implementation of an effective plant variety protection system; and
- enhance public awareness and understanding of the UPOV system of plant variety protection.

The effectiveness of the UPOV system of plant variety protection is enhanced by the provision of guidance and information materials such as Explanatory Notes ("UPOV/EXN" series), Information Documents ("UPOV/INF" series), the General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants, with its associated TGP documents, and the "Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability". Such materials provide the basis for harmonization and, thereby, facilitate cooperation between UPOV members (http://www.upov.int/upov_collection/en/).

Further measures to support and enhance cooperation between members include the UPOV PRISMA PBR Application Tool (http://www.upov.int/upovprisma/en/index.html), information available in the PLUTO Plant Variety Database (http://www.upov.int/pluto/en/) and in the GENIE database (http://www.upov.int/genie/en/).

UPOV AND PLANT GENETIC RESOURCES

UPOV considers that plant breeding is a fundamental aspect of the sustainable use and development of genetic resources. It is of the opinion that access to genetic resources is a key requirement for sustainable and substantial progress in plant breeding. The concept of the "breeder's exemption" in the UPOV Convention, whereby acts done for the purpose of breeding other varieties are not subject to any restriction, reflects the view of UPOV that the worldwide community of breeders needs access to all forms of breeding material to sustain greatest progress in plant breeding and, thereby, to maximize the use of genetic resources for the benefit of society.[86]

Following consultations between the secretariats of CBD, ITPGRFA, the Office of the Union and the Consultative Committee (see background in document CC/101/13 (upov.int)), the Council, during its fifty-seventh ordinary session,[87] approved the following FAQ: "Complementarity between the UPOV Convention, the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)".

[86] See http://www.upov.int/export/sites/upov/news/en/2003/pdf/cbd_response_oct232003.pdf)

[87] Held in Geneva, October 27, 2023

The FAQ approved by the Council is published on the UPOV website Frequently asked questions (upov.int).

The FAQ explains that "By encouraging the development of new varieties of plants, the UPOV system encourages the sustainable use of biodiversity while creating new genetic diversity. New plant varieties with improved yield, more efficient use of nutrients, resistance to plant pests and diseases, salt and drought tolerance and better adaptation to climatic stress, according to the needs and preferences of farmers and consumers, can sustainably increase productivity and product quality in agriculture, horticulture and forestry. These attributes can reduce the pressure on the natural environment and biodiversity by reducing the need for inputs while reducing the area of land needed for agriculture. Plant breeding sustainably uses biological diversity and relies on the conservation of biodiversity to develop new varieties that deliver substantial benefits for farmers and society as a whole. The critical importance of biodiversity to agriculture is recognized in the CBD and the Nagoya Protocol acknowledges the importance of genetic resources for food and agriculture and their special role for food security. The recognition of the importance of crop and genetic diversity for sustainable agriculture and food security is central to the objectives of the ITPGRFA."

The following paragraphs report on some recent areas of cooperation between UPOV and Food and Agriculture Organization of the United Nations (FAO) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

A. Cooperation FAO and UPOV

The Office of the Union received the visit of Mr. Qu Dongyu, Director General of FAO, in Geneva, on May 28, 2024. Mr. Daren Tang, Secretary General of UPOV chaired the meeting. Discussions took place on how the organizations could cooperate in relevant aspects of their work. It was agreed to explore co-operation in communication initiatives and training and assistance matters.

As a follow-up to the above referred meeting, the Office of the Union will organize a working session with the FAO Liaison Office in Geneva, on December 2, 2024, at the headquarters of UPOV. The objective of the meeting is to discuss potential areas of cooperation.

On September 24, 2024, the Office of the Union was contacted by Mr. Abebe Haile-Gabriel, Assistant Director-General and Regional Representative for Africa at the FAO Regional Office for Africa in Accra, Ghana. Mr. Haile-Gabriel referred to the meeting on May 28, 2024, and asked the Office of the Union for a follow-up meeting to address how to make it easier for farmers to obtain seed varieties and, more broadly, about working together on geographical indications, local breeds, and the establishment of knowledgeable hubs in the region. The Office of the Union will organize a virtual meeting with the FAO Regional Office for Africa in Accra.

At the invitation of Mr. Marcelo Resende, representing the FAO in Nicaragua, the Vice-Secretary General of UPOV will make a presentation during the Regional Technical Meeting of National Seed Authorities for Seed Systems Contribution to Food Security, which will take place from November 11 to 13, 2024, in the city of Managua, Nicaragua, through a virtual keynote presentation.

Cooperation ITPGRFA and UPOV

The Office of the Union attended the Tenth Session of the Governing Body (GB) of the International Treaty on Plant Genetic Resources for Food and Agriculture, held from November 20 to 24, 2023, in Rome, Italy.

Relevant matters on cooperation of ITPGRFA and UPOV are reproduced below (see Resolution 14/2023):

9. Encourages the Secretary to continue collaborating with the UPOV Office on relevant matters, as appropriate;

10. Takes note of the status of UPOV's FAQ on the interrelations between the International Treaty, the CBD and UPOV;

II. GENERAL DEVELOPMENTS IN UPOV

A. Situation in UPOV

New members

Armenia

Armenia deposited its instrument of accession to the UPOV Convention on February 2, 2024, and became the seventy-ninth UPOV member on March 2, 2024. Upon depositing the instrument of accession, H.E. Mr. Andranik Hovhannisyan, Ambassador and Permanent Representative of Armenia in Geneva, stated, "Farmers and growers will gain access to new, high-quality plant varieties, adapted to climate change and designed for higher productivity, ensuring competitive production." More here.

Examination of laws or draft laws

Lao People's Democratic Republic

The Council of UPOV, on October 25, 2024, took a positive decision on the conformity of the "Law on Intellectual Property, Part IV New Plant Variety" with the 1991 Act of UPOV Convention, which allows Lao People's Democratic Republic to deposit its instrument of accession to the 1991 Act.

United Arab Emirates

The Council of UPOV, on October 25, 2024, reaffirmed the decision on conformity of the "Draft Law on Plant Variety Protection of the United Arab Emirates" ("Draft Law") with the 1991 Act of the UPOV Convention, which allows the United Arab Emirates, once the Draft Law is adopted with no changes and the Law is in force, to deposit its instrument of accession to the 1991 Act.

B. Development of new plant varieties

By encouraging the development of new varieties of plants, the UPOV system encourages the use of genetic resources for the benefit of society and adds to diversity.

A record number of 28,998 plant variety protection applications were filed in the UPOV members in 2023, representing a rise of 7% compared to 2022. The number of titles issued increased by 42% from 2022 to 21,088 in 2023.

From the establishment of UPOV to the end of 2023, more than 388,000 titles for new plant varieties had been issued by UPOV members. More than 195,000 of those titles are no longer in force, meaning those varieties can be grown without the breeder's authorization.

For a deeper dive into the numbers, including historical totals and trends over the past five years, click here: https://www.upov.int/

C. Introducing the UPOV e-PVP system to help Streamline Plant Variety Protection

UPOV e-PVP offers a comprehensive set of digital tools to support UPOV members in effectively implementing the UPOV system of plant variety protection (PVP). These tools include:

- UPOV PRISMA: an online application tool for transmitting PVP application data directly to PVP offices. UPOV/PRISMA
- UPOV Plant Variety Database (PLUTO Database): A valuable resource offering detailed information on plant varieties and a similarity search tool for variety denominations. upov.int/pluto/en/
- UPOV e-PVP Administration Module: A fully digital system that allows PVP offices to manage applications, communicate with applicants, publish key information, and seamlessly transmit data to the UPOV Plant Variety Database.
- UPOV e-PVP DUS Report Exchange Module: A platform facilitating the exchange of DUS (Distinctness, Uniformity, and Stability) reports between PVP offices.

Together, these tools form the foundation for collaboration among UPOV members in the administration and examination of PVP applications, driving efficiency and enhancing cooperation.

D. UPOV International Certificate on Plant Variety Protection

UPOV has launched in 2024 the UPOV PVP Certificate program to promote the acquisition of knowledge and recognition of expertise, as well as opportunities for continuous learning on PVP matters.

The UPOV PVP Certificate provides international recognition of your knowledge and expertise in PVP matters. Holders of the UPOV PVP Certificate demonstrate to have followed a certain number of courses and contributed to activities concerning the UPOV Convention and its guidance, operation of a PVP Office and examination of applications, including DUS examination. For further information: upov.int

E. Trailblazing Plant Breeding: The Inspiring Story of Dr. Mary Mgonja

From developing drought-tolerant sorghum varieties to licensing maize hybrids that benefit over 15,000 farmers, Dr. Mary Mgonja's work is transforming the landscape of plant variety protection and enhancing food security across Eastern and Southern Africa.

Dr. Mgonja’s journey is a powerful reminder of how innovation and passion can make a tangible impact on farmers' lives. Read her full story: MaryMgonjaStory/Upov

F. Viet Nam videos

In 2024, UPOV published a series of videos on the benefits of plant variety protection for farmers, growers and society in Viet Nam:

- Smallholder ricer farmer: https://www.youtube.com/watch?v=oV_3KC-cUtg
- Local growers: https://www.youtube.com/watch?v=PeT-aEcMiZY

- Longan farmer-breeder: https://www.youtube.com/watch?v=OHg1RE2Lnr4

G. Upcoming Events and Meetings

To access the full calendar of UPOV meetings, go to: Meetings

- The Technical Working Party on Testing Methods and Techniques (TWM) is a group open to DUS experts, biochemical and molecular specialists and plant breeders. The TWM will discuss new methods for variety testing, including phenotyping, data analysis and biochemical and molecular techniques. The TWM will be held in Beijing, China, from April 28 to May 1, 2025, and is open to all experts. The event registration details will soon be available on the website here: link

- In November, two joint webinars will be held about UPOV PRISMA and how it facilitates the transfer of plant variety protection applications to South Africa and the United States. Please follow our social media channels for more details.

For further information about UPOV, please contact the Office of the Union:

E-mail: upov.mail@upov.int Website: www.upov.int

Tel: (+41-22) 338 9153 Fax: (+41-22) 733 0336

[Annex follows]

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

as of November 5, 2024

I. UPOV members

African Intellectual Property Organization[2, 4]
Albania[2]
Argentina[1]
Armenia[2]
Australia[2]
Austria[2]
Azerbaijan[2]
Belarus[2]
Belgium[2]
Bolivia (Plurinational State of)[1]
Bosnia and Herzegovina[2]
Brazil[1]
Bulgaria[2]
Canada[2]
Chile[1]
China[1]
Colombia[1]
Costa Rica[2]
Croatia[2] Czech Republic[2]
Denmark[2]
Dominican Republic[2]
Ecuador[1]
Egypt[2]
Estonia[2]
European Union[2, 3]
Finland[2]
France[2]
Georgia[2]
Germany[2]
Ghana[2]
Hungary[2]
Iceland[2]
Ireland[2]
Israel[2]
Italy[1]
Japan[2]
Jordan[2]
Kenya[2]
Kyrgyzstan[2]
Latvia[2]
Lithuania[2]
Mexico[1]
Montenegro[2]
Morocco[2]
Netherlands (Kingdom of)[2]
New Zealand[1]
Nicaragua[1]
North Macedonia[2]
Norway[1]
Oman[2]
Panama[2]
Paraguay[1]
Peru[2]
Poland[2]
Portugal[1]
Republic of Korea
Republic of Moldova[2]
Romania[2]
Russian Federation[2]
Saint Vincent and the Grenadines[2]
Serbia[2]
Singapore[2]
Slovakia[2]
Slovenia[2]
South Africa[1]
Spain[2]
Sweden[2]
Switzerland[2]
Trinidad and Tobago[1]
Tunisia[2]
Türkiye[2]
Ukraine[2]
United Kingdom[2]
United Republic of Tanzania[2]
United States of America[2]
Uruguay[1]
Uzbekistan[2]
Viet Nam[2]

(Total 79)

[1] 1978 Act is the latest Act by which 17 States are bound.

[2] 1991 Act is the latest Act by which 60 States and 2 organizations are bound.

[3] Operates a plant breeders' rights system which covers the territory of its 27 member States *(Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of), Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden)*.

[4] Operates a plant breeders' rights system which covers the territory of its 17 member States *(Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal, Togo).*

II. States and intergovernmental organizations which have initiated the procedure for acceding to the UPOV Convention

Afghanistan, Brunei Darussalam, Guatemala, Honduras, India, Iran (Islamic Republic of), Jamaica, Kazakhstan, Malaysia, Mauritius, Mongolia, Myanmar, Nigeria, Philippines, Tajikistan, United Arab Emirates, Venezuela (Bolivarian Republic of), Zimbabwe, as well as the African Regional Intellectual Property Organization (ARIPO).

III. States and intergovernmental organizations which have been in contact with the Office of the Union for assistance in the development of laws based on the UPOV Convention

Algeria, Antigua and Barbuda, Bahrain, Barbados, Cambodia, Cuba, Cyprus, El Salvador, Indonesia, Iraq, Lao People's Democratic Republic, Libya, Liechtenstein, Malawi, Mozambique, Namibia, Pakistan, Saudi Arabia, Seychelles, Sudan, Thailand, Timor-Leste, Tonga, Turkmenistan, Zambia, as well as the Southern African Development Community (SADC).

ANNEX 5

REPORT FROM THE SECRETARIAT OF THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE (THE TREATY)

I. INTRODUCTION

1. The Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty) has prepared this report in response to the invitation to provide the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (ITWG) with updates on activities regarding plant genetic resources for food and agriculture (PGRFA).

2. This report contains a summary of major outcomes of the Tenth Session of the Governing Body (GB-10), held in November 2023, and of progress with relevant processes of International Treaty's subsidiary bodies.[88]

3. The International Treaty provides, in Article 14, that Contracting Parties should promote effective implementation of the rolling Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture (GPA), including through national actions and, as appropriate, international cooperation.

4. The International Treaty has 153 Contracting Parties, including the European Union.

II. OUTCOMES OF THE TENTH SESSION OF THE GOVERNING BODY AND PROGRESS WITH RELEVANT INTERSESSIONAL PROCESSES

5. The Tenth Session of the Governing Body adopted seventeen Resolutions. The summary below presents the Working Group with the deliberations of GB-10 on thematic areas which are of direct relevance to the on-going work by the Commission on Genetic Resources for Food and Agriculture (Commission).

Cooperation with the Commission

6. In Resolution 11/2023, the Governing Body invited Contracting to cooperate with the Commission in the preparation of the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture (Third Report) in order to facilitate the updating of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (Second GPA).

7. The Governing Body requested the Secretary to continue strengthening collaboration and coordination with the Secretary of the Commission to promote coherence in the development and implementation of the respective programmes of work of the two bodies, and in particular with regard to:

i. the finalization of the Third Report;
ii. the updating of Second GPA, including through regional consultations for identifying gaps, needs and priorities, and the revision of the reporting system of the World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS) and the Global Information System (GLIS);
iii. the organization of symposia addressing in situ, ex situ and on-farm conservation of PGRFA using virtual conferencing tools;

[88] The documents and the final report of the Tenth Session are available at: https://www.fao.org/plant-treaty/meetings/meetings-detail/en/c/1618930/. Resolution 11/2023, *Cooperation with the Commission on Genetic Resources for Food and Agriculture*, is available on the webpage in the six official FAO languages.

iv. the effects of seed policies, laws and regulations, including a scoping study, based on the availability of additional financial resources, by external partners on the impact of such policies, laws and regulations;
v. the implementation and monitoring of the Second GPA, including technical instruments that facilitate its implementation, such as the Genebank Standards for Plant Genetic Resources for Food and Agriculture, and work on sustainable use of PGRFA, including to strengthen crop breeding systems and crop improvement capacity;
vi. assembling relevant information for measuring and monitoring monetary and non-monetary benefit-sharing, within their respective mandates and existing frameworks;
vii. access and benefit-sharing and digital sequence information/genetic sequence data (DSI/GSD) on PGRFA, including virtual and/or in-person open-ended workshops, as appropriate, with a view to sharing information about gaps in knowledge and technical capacity-building needs and activities related to DSI/GSD;
viii. joint efforts to advocate for the consideration of the objectives and relevant work and policies of the Commission and the Governing Body of the International Treaty in global strategies and frameworks, such as the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors and the Kunming-Montreal Global Biodiversity Framework (GBF), as well as to update FAO Members on progress in the implementation of their respective mandates and work programmes;
ix. GLIS and WIEWS, and relevant targets and indicators; and
x. the development and implementation of national strategies for PGRFA, in close collaboration with the Funding Strategy of the International Treaty.

8. The Secretariat of the International Treaty co-organized with FAO's Plant Production and Protection Division, six regional consultations on the review of the Second GPA. Two of the six consultations took place on-line. The Secretariat supported the participation of the respective National Focal Points of the International Treaty. The consultations included the discussion of priorities for the conservation and sustainable use of PGRFA.

Conservation and Sustainable Use of PGRFA

9. In Resolution 6/2023, the Governing Body, inter alia, thanked the Ad Hoc Committee on Conservation and Sustainable Use for defining future strategies to support countries in the implementation of Articles 5 and 6 of the International Treaty through the possible development or establishment of voluntary guidelines, including through a global symposium and expert input or small groups.

10. The Governing Body took note of the revised Concept Note of the Joint Programme on Biodiversity in Agriculture for Sustainable Use of PGRFA and welcomed the efforts of the Secretary to implement the new prototype of the online Toolbox for Sustainable Use of PGRFA.

11. The Governing Body requested the Secretary to continue analyzing and monitoring the identified gaps and needs highlighted in the Background Study on the Bottlenecks and Challenges to the implementation of Articles 5 and 6, and called upon Contracting Parties to share information on the difficulties and challenges encountered in implementation, as well as possible new initiatives, activities, and approaches that could be undertaken to address them.

12. The Governing Body requested the Secretary to organize regional consultations on implementation, with a particular focus on identified bottlenecks and possible approaches to address them, as well as to continue facilitating training and capacity building.

13. The Governing Body decided to reconvene the Ad Hoc Committee to advise the Secretariat on the implementation of Articles 5 and 6. In October, the Ad Hoc Committee held its first of the two meetings programmed for the biennium. Among other matters, the Committee discussed current work and future strategies to support countries in implementation based on areas of action of the Joint Programme, and received an outline of the draft voluntary guidelines. The Committee advised on how to promote cooperation, mainstreaming and partnerships, including with the Commission, as well as

on support to global crop conservation strategies under the leadership of the Global Crop Diversity Trust.[89]

Farmers' Rights

14. In Resolution 7/2023, the Governing Body, inter alia, welcomed the publication of *Options for Encouraging, Guiding and Promoting the Realization of Farmers' Rights as set out in Article 9 of the International Treaty* (the Options). It invited Contracting Parties and relevant stakeholders, especially farmers' organizations, to continue submitting to the Secretary, for inclusion in the Inventory, experiences and best practices for national implementation.

15. The Governing Body also took note of the annotated outline for the assessment of the state of implementation of Article 9, and requested Contracting Parties and other interested stakeholders, especially farmers' organizations, to submit inputs and comments on the annotated outline. The Governing Body requested the Secretary to carry out and finalize the assessment of the state of implementation of Article 9, and present the full report to the Governing Body.

16. The Governing Body decided to reconvene the Ad Hoc Technical Expert Group on Farmers' Rights in order to: review and agree to the outline for the assessment; review the assessment and provide conclusions for the Eleventh Session of the Governing Body; and provide advice to the Eleventh Session of the Governing Body on the use of the Options.

17. With regard to capacity building for implementation, advocacy and communication, the Governing Body invited Contracting Parties and relevant organizations to take initiatives to convene regional workshops and other consultations including among different regions within the framework of South-South and triangular cooperation. The Governing Body requested the Secretary to strengthen, to the extent feasible, collaboration between the International Treaty and other units and partners that work for the promotion of Farmers' Rights within and outside FAO, and the broader United Nations including with international human rights bodies and the relevant targets of the GBF, in order to promote the protection and realization of Farmers' Rights. The Governing Body also invited Contracting Parties to promote sustainable biodiverse production systems and facilitate participatory approaches such as community seed banks, community biodiversity registries, participatory plant breeding and seed fairs, including considering providing legal recognition of such approaches as tools for realizing Farmer's Rights.

18. In June, the Ad Hoc Technical Expert Group held its first of the two meetings programmed in the biennium. The Expert Group agreed on the outline for the assessment. It discussed the relevance of new technologies and how they could impact on Farmers' Rights. It also discussed the issue of the rights of Indigenous Peoples and local communities. The Expert Group agreed that both topics could become part of future discussions.[90]

DSI/GSD

19. In Resolution 16/2023, the Governing Body, inter alia, requested the Secretary to continue monitoring developments in all relevant international fora with regard to DSI/GSD and to support the subsidiary bodies, in particular those relating to the enhancement of the Multilateral System of Access and Benefit-sharing, Farmers' Rights, and Sustainable Use, in taking into account related developments when addressing the issue of DSI/GSD.

20. The Governing Body further requested the Secretary to continue coordinating with the Secretariats of the Convention on Biological Diversity (CBD) and the Commission in any activities related to DSI/GSD, in order to ensure coherence and avoid duplication of work.

21. The Governing Body invited Contracting Parties and other stakeholders to provide information on activities to promote technology transfer on mutually agreed terms, training and capacity development, and scientific cooperation to reduce the existing gap on capacity regarding

[89] The report of the meeting is available at: https://www.fao.org/plant-treaty/meetings/meetings-detail/en/c/1679036/.
[90] The report of the meeting is available at: https://www.fao.org/plant-treaty/meetings/meetings-detail/en/c/1679035/.

DSI/GSD between developed and developing countries, for consideration by the Governing Body at its Eleventh Session.

Operation and Enhancement of the Multilateral System of Access and Benefit-sharing

22. In Resolution 2/2023, the Governing Body, inter alia, requested the Secretariat to continue its collaboration with the Secretariat of the Commission on updating the report on the availability of material in the Multilateral System, including reasons why there are Contracting Parties that have not placed any material in the Multilateral System.

23. The Governing Body invited Contracting Parties and other holders of material to use, on a voluntary basis, the Digital Object Identifiers (DOIs) of the GLIS for the identification of material available in the Multilateral System. It also took note of the progress made since the Ninth Session with Easy-SMTA and the Data Store and requests the Secretary to continue to maintain the help-desk function on the operations of the Multilateral System.

24. Through Resolution 3/2023, the Governing Body, inter alia, reaffirmed the mandate of the Ad Hoc Open-ended Working Group to Enhance the Functioning of the Multilateral System, to finalize the enhancement by the Eleventh Session in 2025.

25. The Governing Body requested the Co-Chairs of the Working Group to give early attention to three identified “hotspots”, namely: DSI/GSD; the expansion of Annex I; payment structure and rates.

26. Following GB-10, the Working Group held its eleventh meeting in April 2024. In relation to DSI/GSD, the Working Group agreed to consider the possibility of developing a specialized approach for DSI/GSD on PGRFA under the International Treaty, while monitoring the relevant processes under the CBD, to ensure mutual supportiveness. In the views of the Working Group, any solution should not restrict facilitated access to PGRFA or open access to DSI/GSD on PGRFA and should seek to exclude double payments by users.[91]

27. The twelfth meeting of the Ad Hoc Working Group took place in September 2024. The Working Group undertook a first reading of Co-Chairs’ proposal containing the Draft Resolution, the revised SMTA and the draft text for the amendment to the list of crops covered by the Multilateral System. It agreed to use the texts as the basis for further work at its next meeting.

28. The Working Group reviewed the section on DSI/GSD in the Draft Resolution. It reiterated that any proposals that address DSI/GSD within the International Treaty should aim at being mutually supportive with a possible mechanism developed under the CBD, including to avoid duplicative payments and obligations.

29. Further work planned by the Working Group includes two more formal meetings and an informal physical meeting to be co-organized with the Meridian Institute in the third week of December.[92]

GLIS

30. In Resolution 5/2023, the Governing Body, inter alia, took note of the collaboration with WIEWS, Genesys, Web-SDIS, the DivSeek International Network, EURISCO, and the CGIAR Genebank Initiative on PGRFA documentation and invites the Secretary to continue the collaboration with these entities and systems to enhance synergies and mutual support.

31. The Governing Body reconvened the GLIS Scientific Advisory Committee with the same terms of reference as the previous biennium, and requested the Committee to continue considering scientific and technical issues related to the conservation and use of PGRFA with relevance to DSI/GSD, as they relate to Article 17 of the International Treaty, and the implications of the relevant outcomes of the CBD COP and their implementation on the GLIS Programme of Work in future years. In particular, the Governing Body requested its Secretary to provide a report to the Committee and the

[91] The report of the meeting is available at: https://openknowledge.fao.org/server/api/core/bitstreams/8ffa72f6-126e-48cd-b576-51f0e7d4032a/content.
[92] The report of the meeting is available at: https://openknowledge.fao.org/server/api/core/bitstreams/8913618c-eac9-46c1-9797-5be3db68594a/content.

Eleventh Session of the Governing Body on relevant updates on documentation and information exchange of PGRFA in the context of the GBF.

32. The Governing Body also requested the Secretary to advance on the exchange of relevant information and links with the Access and Benefit-sharing Clearing-House in the context of the GLIS Programme of Work.

Cooperation with the CBD

33. A resolution by the Governing Body, on the role of PGRFA within the GBF, addressed the general relationship with the GBF. Another resolution, on cooperation with the CBD, addressed various interfaces between the International Treaty and the CBD and its Nagoya Protocol.

34. Through Resolution 1/2023, the Governing Body welcomed the GBF and acknowledged the synergetic implementation of the goals, targets of the GBF and the objectives of the GBF as particularly relevant to sustainable food systems. Among other matters, the Governing Body invited Contracting Parties to the International Treaty to encourage effective liaison between the respective national focal points in national processes related to GBF implementation, and mainstream the implementation of the International Treaty within National Biodiversity Strategy and Action Plans (NBSAPs).

35. The Governing Body also emphasised the importance of developing a monitoring framework for the GBF that relies, inter alia, on established monitoring systems and reporting processes, including those related to PGRFA.

36. Through Resolution 13/2023, the Governing Body specifically focused on cooperation with the CBD. In relation to the GBF, the Governing Body took note of the Bern process on cooperation and coordination among Parties to the biodiversity-related conventions. It welcomed the adoption of a strategy for resource mobilization to support the implementation of the GBF as well as the establishment of the Global Biodiversity Framework Fund.

37. In relation to the mainstreaming of issues related to PGRFA into NBSAPs, the Governing Body requested its Secretary to explore facilitative measures.

38. With regard to general cooperation among the Secretariats, the Governing Body requested its Secretary to continue exploring with the Secretariat of the CBD, practical means and activities to further enhance this cooperation, including by renewing the Memorandum of Cooperation and developing joint initiatives between the two Secretariats, as well as to cooperate with the Executive Secretary of the CBD by providing information on developments and practical implementation experiences within the International Treaty.

39. With regard to DSI/GSD on genetic resources, the Governing Body requested its Secretary to collaborate and, as appropriate, coordinate with the Secretariat of the CBD in order to promote coherence and mutual supportiveness between the respective conventions and implementing processes.

Contribution of FAO to the Implementation of the International Treaty

40. In Resolution 9/2023, the Governing Body, inter alia, emphasized the importance of FAO's continued assistance with the implementation of the International Treaty at the national level. It invited FAO to recognize the importance of the implementation of the Treaty at the national level, and to continue supporting the efforts to increase the membership of the International Treaty.

41. The Governing Body welcomed progress made in the implementation of the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors and its 2021-23 Action Plan, and noted the important role of the Strategy as coordination mechanism for activities through which FAO supports countries in integrating biodiversity, including the conservation and sustainable use of genetic resources for food and agriculture and other components of biodiversity of relevance to food and agriculture, into relevant programmes, policies and legislation. It invited FAO to take into consideration new developments within the International Treaty in the review and updating of the Action Plan and to integrate the relevant components of the International Treaty into the implementation of initiatives and strategies.

42. The Governing Body took note of the current efforts of the FAO Office of Climate Change, Biodiversity and Environment to enhance synergies and mutual support among its component teams in order to improve synergies in delivering on and contributing to the overall Strategic Objectives of FAO.

Multi-Year Programme of Work (MYPoW)

43. In Resolution 15/2023, the Governing Body approved the MYPoW 2024–2029. For the Eleventh Session of the Governing Body in 2025, the MYPoW foresees, among other matters, the participation in the process of updating the Second GPA.

The Funding Strategy

44. In Resolution 4/2023 on the Funding Strategy, the Governing Body, inter alia, invited relevant international mechanisms, funds and bodies, stakeholder groups and other international organizations to provide information to the Secretariat that would enable the Standing Committee on the Funding Strategy to better leverage funding from all sources for International Treaty implementation and the delivery of non-monetary benefit-sharing.

45. The delivery of non-monetary benefit-sharing will be monitored by the methodology for measuring non-monetary benefit-sharing, which is being finalized and will be tested in the biennium 2024–2025 under the guidance of the Standing Committee.

46. The Standing Committee held its first meeting of the biennium in June. It updated its workstreams in the light of the timeline of the Funding Strategy, extended to 2027, and planned for two more meetings in the biennium.[93]

Eleventh Session of the Governing Body

47. The Governing Body elected Mr. Alwin Kopse (Europe Region) as Chairperson of the Eleventh Session of the Governing Body. The Governing Body agreed to convene its Eleventh Session in the last quarter of 2025.

48. Representatives of the Secretariat of the International Treaty will be present at this twelfth meeting of the ITWG and will be available to brief participants on any relevant topic concerning on-going and possible future cooperation.

[93] The report of the meeting is available at: https://openknowledge.fao.org/server/api/core/bitstreams/b9e5e255-b7b2-40f7-af90-1c9ec3d3fc82/content.

ANNEX 6

REPORT FROM THE CGIAR SYSTEM

Introduction

This report has been prepared by CGIAR in response to an invitation from the Secretariat of the FAO Commission on Genetic Resources for Food and Agriculture. It is structured to correspond, in general, to agenda items 3-5 of the Twelfth Session of the Intergovernmental Technical Working Group on Plant Genetic Resources (ITWG-PGRFA). Some sections of this report were previously included in the 2023 Annual Technical Report of the CGIAR Research Initiative on Genebanks as well as in the previous CGIAR submission to the Tenth Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty), in November 2023; where possible, we have updated statistics (for example, genebank holdings) in those sections.

Agenda item 3. The Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture

Scientists from various CGIAR Centers were involved in the preparation of draft chapters and thematic background papers for the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture (3rd SOW-PGRFA). For example, scientists from the Alliance of Bioversity and CIAT contributed to the development of the chapters on *Ex Situ* and *In Situ* conservation. CIFOR-ICRAF facilitated the FAO-led deliberations on "Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture" for the Africa Community of Practice (CoP) from 7th to 9th May 2024, which was attended by 67 participants from thirty-nine African countries. CIFOR-ICRAF scientists also participated in the drafting of the FAO-led Second State of World Forest Genetic Resources Report (SoW-FGR-2), leading Chapters 3 and 7.

Agenda item 4. Status of implementation and review of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture

Agenda item 4.1 Review of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture

CGIAR contributions to the Review of the Second Global Plan of Action

The presentation of the Review of the Second GPA, based on the identified gaps and needs, is foreseen at the Commission's Twentieth Regular Session in 2025 as a major output under its Multi-Year Programme of Work, in close cooperation with the Governing Body of the Plant Treaty. In this regard, a series of regional consultations were organized in 2024, to take into account the specific gaps and needs of the regions. Regional consultations involved the National Focal Points (NFPs) for PGRFA of the Commission, as well as NFPs of the Treaty.

In December 2023, the Food and Agriculture Organization of the United Nations and the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) signed a Letter of Agreement whose objective was to establish the terms and conditions of a collaboration to organize and host a three-day regional consultation in the Alliance's campus in Cali on May 2024. The regional consultation in Latin America eventually took place in the CIAT Campus in Cali, Colombia, on 21-23 May 2024, which gathered inputs from national focal points and national and regional experts on the revision of the Second GPA. Besides hosting the meeting, the Alliance of Bioversity International and CIAT prepared a Narrative and Technical Reports of the Regional Consultation for Latin America and the Caribbean, which fed into the document, prepared by the Secretariat of the CGRFA, combining and summarizing the feedback received in all regional consultations on the revision of the Second

GPA. This document is to be considered by the ITWG-PGRFA at its meeting in December 2024. ICRISAT also participated and contributed to the “Regional Consultation for Asia-Pacific on the review of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture”, from 23 - 25 July 2024, in Bangkok, Thailand.

In situ conservation and on-farm management

In this section we provide examples of activities in which CGIAR Centers were involved supporting *in situ* conservation and on farm management of PGRFA.

The Alliance of Bioversity and CIAT (the Alliance), CIP and ICARDA collaborate under the CGIAR Initiative Nature-Positive Solutions (NATURE+) with the aim to improve smallholder farmers’ access to diversified seed systems, strengthening food and nutrition security while enhancing climate change adaptation. A 2023 impact study in Kenya and Uganda provided further evidence of the benefits resulting from community seed banks, highlighting their crucial role in improving local seed systems, offering a wider variety of crops, and boosting farmers’ resilience to climate change. Further building on the NATURE+ initiative, Bioversity and CIAT have worked with three community-led farmer groups in Kenya to aggregate their small land parcels into larger, nature-positive farms. This approach aims to address challenges such as declining agricultural production caused by land fragmentation and degradation, focusing on land restoration, boosting yields, and attracting investments. The project integrates permaculture and other sustainable practices while fostering equitable value chains. Spanning 76 and 55 hectares, the aggregated farms will improve food security and access to planting materials. With support from the local community and collaboration with CGIAR, around 200 farmers are participating in the initiative, which is aligned with country agricultural development plans and repurposes previously unused land for productive use.

CIP has an ongoing STC-CGIAR project in collaboration with INIA Peru (Instituto Nacional de Innovación Agraria) and farmers communities at the Agrobiodiversity Zone of Cuyocuyo, Peru, where support is being provided to the implementation of community seed banks, including capacity building and characterization of Andean roots and tuber crops, including potato, as well as the repatriation of landraces cleaned of diseases. In another project, supported by the mining company Poderosa, CIP is developing a project with the objective of identifying yacon varieties with superior agronomic and nutraceutical attributes within the CIP germplasm collection and among local varieties from Pataz, conducting a diagnosis and subsequent virus cleaning of the most promising yacon varieties, and distributing virus-free yacon materials to farmers.

For over 15 years, CIMMYT, CIP, ICARDA, IFPRI, and ICRISAT have been actively working on seed system policies and laws with a wide range of partners in a number of countries, achieving positive outcomes. For instance, a comprehensive policy study conducted in Colombia finds that local seed conservation and use practices that are critical for the livelihood and food security of farmers are largely reliant on farm-saved seeds and seeds obtained from friends, neigbours, relatives, and the local market. However, such informal seed markets and practices are under increasing pressure. The study concluded that the evolution of seed and related policies and laws in support of farmer-managed seed systems in the country is moving in a direction to alleviate this pressure, but that effective implementation still lags behind.[94] Specific positive outcomes of country support delivered though the Alliance have contributed not only to the adoption of the *Action plan for the conservation, multiplication, use, and exchange of native and creole seeds*, but most importantly to Colombia’s recent ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). These ongoing efforts are critical for strengthening informal seed systems, particularly in the context of Nature-Positive Solutions countries, where understanding the legal and policy frameworks is essential to support sustainable seed system reforms. For example, Nature+ contributed to the review of the Kenyan Vegetatively Propagating Seeds (VPS) Regulations which will allow for

[94] Ramos, J.P.; Vernooy, R.; Ramirez, M. (2024) Políticas, leyes y reglamentos en apoyo de los sistemas de semillas gestionados por los agricultores: El caso de Colombia. Cali (Colombia): Bioversity International y el Centro Internacional de AgriculturaTropical (CIAT).

the registration of farmers' varieties of VPS crops and the production of seed and propagating materials through quality declared seed (QDS), an alternative system for seed quality assurance. These Regulations have undergone all required public consultations and are currently under review at the Attorney General's Office for their final clearance and approval. In addition, in 2014, two meetings were organized on the Kenyan ABS Regulations, co-funded by Nature+ and the Genebank Initiative, which contributed to the further elaboration of such regulations. The latter are currently undergoing public consultations before their submission to the Parliament and the Attorney General's Office. The Alliance also hosted a national seed fair in Kenya with the participation of more than 1000 farmers. In Burkina Faso, the Alliance organized a workshop on "Strengthening Inter-Country and International Dialogue, Scaling Up and Creating Synergies" under the Sustlives Project, whose objective was to create a multi-stakeholder platform on Neglected and Underutilized Species (NUS) and create synergies between actors and stakeholders working on NUS crops across the region.

The Alliance also established the In-situ Monitoring System in the Dry Corridor of Guatemala in early 2023 to promote *in situ* conservation. This system employs advanced technologies to gather precise climate and soil data, enabling small-scale farmers to make informed decisions for sustainable resource management. This model aims to optimize agri-food systems and preserve local biodiversity, benefiting farmers in Guatemala and potentially other regions.

Additionally, the My Farm Trees (MFT) app is a co-designed digital platform by the Alliance of Bioversity and CIAT, providing information and cash incentives for restoring degraded landscapes, successfully restoring over 700 hectares. It promotes community-led tree restoration using native species and utilizes mobile technology and blockchain for transparency, facilitating digital payments for restoration efforts. Funded by the Global Environment Facility and implemented by IUCN, MFT integrates various solutions and has conducted successful pilots in Kenya and Cameroon, with scaling efforts underway across Africa, Asia, and Latin America.

As anticipated in the previous CGIAR report, the International Potato Center (CIP) has developed a series of initiatives to facilitate the systematic monitoring of on-farm conserved landrace populations. One of such initiatives focuses on involving youth in landrace monitoring through citizen science. The digital tool used is called VarScout, and the landrace observations are stored on a website called WikiPapa (see: https://wikipapa.org/). The combination of a well-established network of hotspots, robust monitoring tools and a decision support platform make it possible to conduct timeline comparisons and actively monitor the conservation status of landraces on-farm, which has continued in the last two years. In addition, for more than a decade CIP and partners have also been supporting a custodian farmers network which involves more than 100 communities from 9 regions of Peru's highlands. Most recently, CIP developed the Riku-Agrobio toolbox, designed for *in situ* agrobiodiversity monitoring from genes to landscape (https://rikuy-agrobio.org/).

To help equip farmers, scientists, and development institutions with useful information and tools to find the "right tree in the right place for the right purpose," CIFOR-ICRAF researchers have combined years of in-depth knowledge and a vast collection of research with easily accessible technology to create the Global Tree Knowledge Platform (GTKP). The GTKP's wide range of interlinked databases, maps, R open-source software packages, guidelines and other decision-support tools to guide the planting – and survival – of trees in a range of environments was further enhanced recently with a new set of tools.[95]

[95] These include the Tree Globally Observed Environmental Ranges (TreeGOER; Kindt 2023: https://doi.org/10.1111/gcb.16914; different versions for 2023 and 2024 are available via Zenodo: https://doi.org/10.5281/zenodo.7922927) database providing information on the environmental ranges for 48,129 tree species (and thus the largest database available globally providing this type of information), the GlobalUsefulNativeTrees (GlobUNT; Kindt et al. 2023 https://doi.org/10.1038/s41598-023-39552-1 ; different versions for 2023 and 2024 are available via https://worldagroforestry.org/output/globalusefulnativetrees) database providing information on the native country (and for larger countries also the subnational) distribution and uses for 14,014 tree species (and therefore the largest database of its kind), the CitiesGOER (different versions available via https://zenodo.org/records/10004594) database providing environmental conditions for 52,602 cities and the ClimateForecasts (different versions available via

Ex situ conservation

i. *Holdings by CGIAR Centers' Genebanks*

In total, the eleven CGIAR genebanks that have signed agreements with the Governing Body of the Plant Treaty conserve close to 718,000 accessions in the form of seeds, tissue culture, tubers, cryopreserved samples, trees and plants in the field and screenhouse. These PGRFA are conserved and made available in the Multilateral System using the standard material transfer agreement (SMTA).

Five Centers (AfricaRice, CIAT, ICRISAT, IITA and IRRI) manage seed collections that have sustained performance targets for availability, safety duplication, documentation and quality management.

Furthermore, CGIAR Genebanks maintain approximately 64,797 accessions that are not currently available under the Plant Treaty's multilateral system since they are maintained under black-box or other legal conditions that don't allow for their distribution with the SMTA or are simply temporarily unavailable (e.g. because they need to be regenerated). Details concerning the Centers, crop collections and numbers of accessions available for distribution under the SMTA are included in Table 1.

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https://zenodo.org/records/10776414) database providing environmental conditions for 15,504 weather station locations. TreeGOER provides the environmental ranges for 38 bioclimatic variables (such as the maximum temperature of the warmest month or the Climatic Moisture Index), eight soil variables and three topographic variables. CitiesGOER and ClimateForecasts document environmental conditions for the same variables for a historical (1970 - 2000) and three future climates for low and high emission scenarios. Containing information for the same environmental variables, these databases can be combined to calculate the position of a planting location in environmental space with respect to the environmental ranges of species included in TreeGOER. One of the methods to combine these databases and calculate a climate suitability score is provided through the treegoer.score() function of the BiodiversityR (https://cran.r-project.org/package=BiodiversityR) package (this open-source package that also features in the GTKP has been widely downloaded and used, being installed over 330,000 times from the CRAN R mirror server). For species included in GlobUNT, users can directly select a weather station location in the GlobUNT shinyApp to calculate climate scores for filtered tree species for any selected country and territory in the world. GlobUNT and TreeGOER directly contribute to the planning, monitoring and certification of tree planting projects and mentoring of tree planters via the The Global Biodiversity Standard (TGBS; https://www.biodiversitystandard.org/). TGBS is the world's only international standard that recognises and promotes the protection, restoration, and enhancement of biodiversity and that was developed by technical partners that include Botanic Gardens Conservation International, the Society of Ecological Restoration and CIFOR-ICRAF. TGBS was launched at the Sixtieth Conference of the Parties to the UN Convention on Biological Diversity in 2024 (CBD COP16). It could be noted that TGBS directly relates to the Global Strategy for Plant Conservation, as exemplified by these 2023 to 2030 complementary actions:

- 8b: Use genetically, biologically or ecologically appropriate native plant species, including species of conservation concern, in areas planted for carbon sequestration and in nature-based solutions or ecosystem-based approaches for climate mitigation and adaptation.
- 9: Co-develop and implement programmes with indigenous peoples, local communities and relevant stakeholders to sustainably maintain and manage wild plants that are of socioeconomic and cultural importance, as well as their ecosystems, and to enhance benefits for people.
- 11: Ensure that genetically, biologically or ecologically appropriate native plant species, including species of conservation concern, are used in ecosystem restoration for nature-based or ecosystem-based solution projects.

The GTKP and some of its resources such as GlobUNT have also been featured among capacity building and knowledge hubs in the FAO, SCBD & SER (2024), *Delivering restoration outcomes for biodiversity and human well-being – Resource guide to Target 2 of the Kunming-Montreal Global Biodiversity Framework* that was launched at CBD COP16 (https://doi.org/10.4060/cd2925en).

Table 1: PGRFA conserved and made available by CGIAR Centers' genebanks pursuant to their Article 15 agreements with the Governing Body

CENTER	CROP	ACCESSIONS AVAILABLE WITH SMTA
AFRICARICE	Rice	20,678
BIOVERSITY	Banana	1,691
CIAT	Beans	37,936
	Cassava	5,957
	Forages	22,657
CIMMYT	Maize	28,397
	Wheat	120,462
CIP	Andean roots and tubers	1,178
	Potato	7,414
	Sweet potato	6,206
ICARDA	Barley	31,851
	Chickpea	15,229
	Faba bean	9,594
	Forages	25,269
	Grasspea	4,357
	Lentil	14,342
	Pea	4,591
	Wheat	43,357
ICRAF	Fruit and multipurpose trees	15,266
ICRISAT	Chickpea	20,487

	Groundnut	15,240
	Pearl millet	25,407
	Pigeon pea	13,492
	Small millets	11,694
	Sorghum	44,403
IITA	Banana	392
	Cassava	3,584
	Cowpea	17,069
	Maize	1,680
	Misc legumes	6,751
	Yam	3,886
ILRI	Forages	3,939
IRRI	Rice	127,750
	Total	710,823

Source: CGIAR On-line Reporting Tool, covering period up to December 31, 2023.

ii. Acquisitions of PGRFA by CGIAR Centers' Genebanks

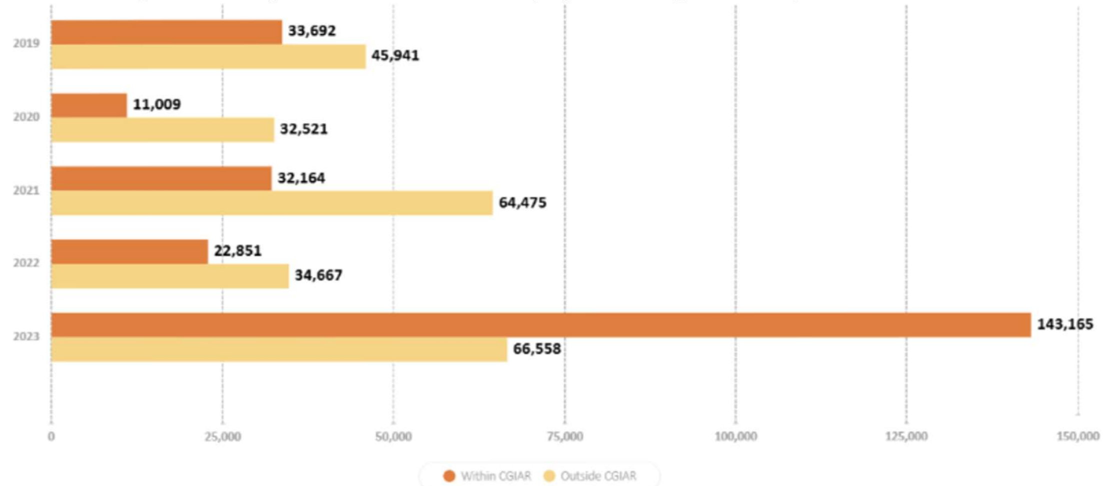
In 2023, new materials were received or accessioned (1,758 accessions) from Brazil, French Polynesia, Niger, Papua New Guinea, Peru, South Sudan, Togo, the United Kingdom and Zambia, as well as from CGIAR breeders.[96] Out of this, 746 new accessions of rice, maize, sweet potato, grasspea, miscellaneous legumes, yam cowpea, cassava and forages were incorporated in the collections of 6 CGIAR Centers, namely Africa Rice, CIMMYT, CIP, ICARDA, IITA and ILRI. Only 42 of these accessions were acquired without an SMTA or without permission to redistribute the material. In 2024, the UNDAC (Universidad Nacional Daniel Alcides Carrión) has donated 109 varieties of potato, collected at the region of Pasco, Paucartambo, Peru, to the CIP Genebank for cleaning and long-term conservation. In 2023, ICRISAT also acquired and registered 102 accessions of sorghum and 874 accessions of pearl millet. In 2024, it further acquired and registered 1600 accessions of sorghum.

[96] The CGIAR Research Initiative on Genebanks' Annual Technical Report 2023.

iii. Distribution of PGRFA by CGIAR Centers

There is considerable fluctuation, from year to year, in the ratio of materials the CGIAR Centers' genebanks send to recipients within the CGIAR (mainly breeders) and to recipients outside the CGIAR.

Figure 1: Samples distributed annually by CGIAR genebanks from 2019 to 2023.



Source: CGIAR Research Initiative on Genebanks, Annual Technical Report 2023.

The CGIAR Centers have distributed over 6,005,460 samples of PGRFA with more than 63 thousand SMTAs during the 17 years they have been operating under the Plant Treaty framework. The majority of these PGRFA (75 to 80 percent) were improved materials from the Centers' breeding programs. While it varies from year to year, the remaining 20 to 25 percent are from the genebanks. Table 2 provides details of materials distributed (from both genebanks and breeding programs)[97] by each CGIAR Center.

Table 2: CGIAR Centers' transfers of PGRFA with SMTAs, 2007 to 2022-24.

Center	SMTAs[98]	Samples[99]	PUD[100]	From	To
AfricaRice	656	58,990	31,872	2007-03-05	2023-11-28
Bioversity	605	9,247	885	2007-01-24	2023-12-11
CIAT	3,209	315,267	36,646	2007-01-05	2022-02-24
CIMMYT	27,227	3,315,792	0	2007-03-16	2024-04-10

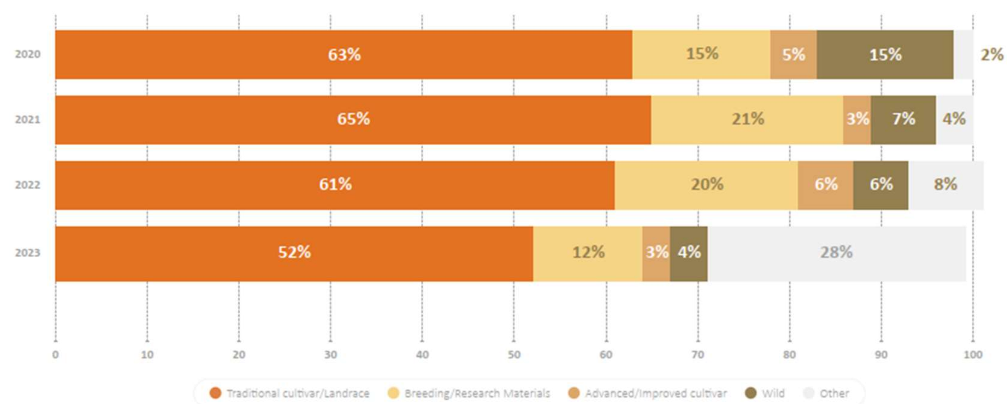
[97] Not all Article 15 Centers have breeding programs, e.g., Bioversity, ICRAF.
[98] This column accounts for the total number of SMTAs that each Center has signed to transfer plant germplasm from both the genebanks and the breeding programmes, and for both non-improved materials and PGRFA under Development.
[99] This column includes the total number of samples that have been transferred by each Center from both the genebanks and the breeding programmes. N.B. Samples may not be the same as accessions as Centers often send 2 or more samples of the same accession in the same transfer.
[100] Total number of samples of PGRFA under Development that have been transferred by each Center, from both the genebanks and the breeding programmes. N.B. These numbers are not in addition to the numbers in the Samples column as they are already counted in the totals for each Center.

CIP	904	24,934	13,140	2007-01-19	2024-10-01
ICARDA	12,177	1,085,993	93,4771	2007-02-13	2023-12-28
ICRAF	581	3,157	0	2007-03-05	2023-11-28
ICRISAT	6,419	382,535	90,432	2006-12-07	2023-12-31
IITA	1,285	5,5376	0	2007-03-07	2023-10-24
ILRI	1,049	15,740	0	2007-02-22	2023-12-19
IRRI	10,036	819,181	468,800	2007-01-04	2024-02-03

Source: Plant Treaty Secretariat. Data obtained from Easy-SMTA and ICRAF CIFOR.

In 2023 alone, CGIAR Genebanks provided more than 201,000 germplasm samples to more than 1050 requestors in approximately 70 countries. The largest percentage of external distributions was for research, received by universities and advanced research institutes. India, the Philippines, Viet Nam, Syrian Arab Republic and Nigeria were the top five recipient countries in 2023, receiving 68 percent of the samples distributed externally.

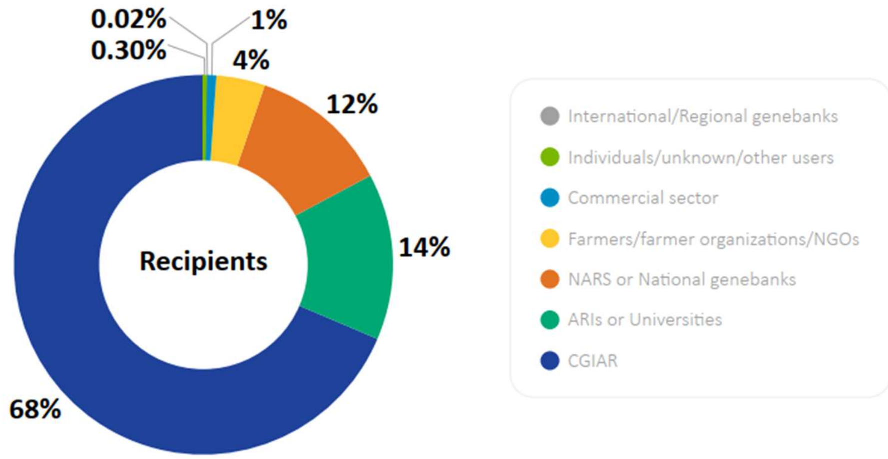
Figure 2: Types of materials requested from 2020 to 2023



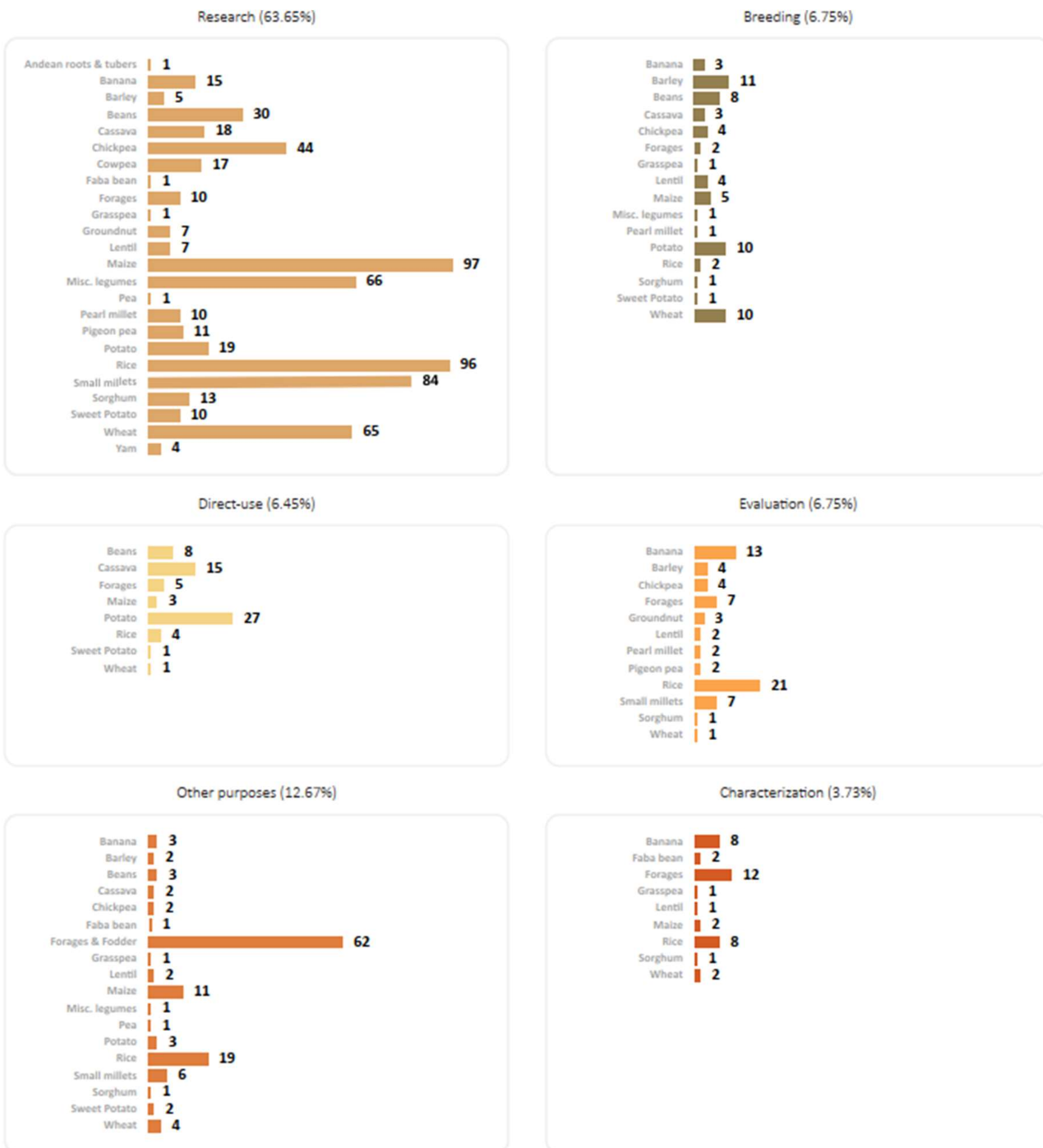
Source: CGIAR Research Initiative on Genebanks, Annual Technical Report 2023.

More than 8,400 samples of beans, cassava, forages, maize, potato, pearl millet, rice and sweet potato were disseminated to farmers, NGOs and farmer organizations in Benin, Chad, Colombia, Ethiopia, Guatemala, India, Lebanon, Mexico, Peru, the Philippines, Singapore, Tonga and the United States of America. A total of 2,774 samples were sent to commercial sector users in 24 countries. CGIAR breeders and researchers received 68 percent of the disseminated germplasm for research and breeding.

Figure 3: Recipients of germplasm distributed by CGIAR genebanks



Source: CGIAR Research Initiative on Genebanks, Annual Technical Report 2023.Figure 4: Requests for germplasm that were received by CGIAR Genebanks from outside CGIAR Centers



Source: CGIAR Research Initiative on Genebanks, Annual Technical Report 2023.

iv. Highlights of efforts to add value to CGIAR collections, manage them more efficiently, and increase their use

CGIAR genebanks carried out routine operations to ensure that crop collections are conserved and made available upon request. In 2023 only, seed lots and tissue culture samples were regenerated and multiplied in the field, screenhouse and laboratory (140,000 samples in 2023), viability tested (167,000), health tested (43,000) and disease cleaned (8,000).[101]

The CGIAR Research Initiative on Genebanks made significant strides to harmonize genebank workflows as the basis for increasing the alignment of data and quality management across Centers,

[101] The contents of this section are drawn from The CGIAR Research Initiative on Genebanks' Annual Technical Report 2023.

following a similar model used in breeding. Genotypic data resources on more than 20,000 accessions are now collated in the same software platform, GIGWA, and high throughput technology is being mainstreamed across genebanks for seed phenotyping. Aligning digital resources and systems in this way allows us to move towards a shared vision of harmonized resources for exploring, selecting and ordering the germplasm of diverse crops from CGIAR genebanks.

The development of new artificial intelligence (AI) technology is also facilitating the automation of accessions' identification and allows large-scale screening of diversity for desired traits. The wide-scale screening of collections for specific traits to tackle climate change challenges and emerging or intractable pests and diseases is becoming more feasible. AI can help users to select germplasm more precisely, but it also appears to be enabling "big screening" of collections.

To strengthen the global system of genebanks, directly addressing SDG 2.5, CGIAR genebanks engaged with more than 60 NARS partners in capacity building and collaboration, covering a range of genebank operations and activities from cryopreservation to the use of genomic tools for collection management and use. Fifteen NARS partners benefited from project funding to develop capacity in genebank operations and international policy implementation. Regional workshops were designed to respond to priority capacity building needs for Sub-Saharan Africa, Central and Western Asia and North Africa and Latin America. These workshops have helped to extend the reach of communities of practice (CoPs) on the themes of using genotypic data to manage collections and cryobanking as well as general genebank operation. Eleven institutes in Central and South America have pooled resources to genotype and map genetic diversity of their respective collections of beans, maize, cassava, potato and wheat.

Since 2022, CIP has been implementing a network focused on cryopreservation in Latin America. In total, scientists from 10 countries in the region were trained in cryopreservation techniques at CIP, during a two-week hands-on training. Of those, partners from seven countries have signed Memorandum of Understanding (MoU) with CIP, and two have signed agreements for safety duplication of their clonal collections. These two countries have received support from CIP to improve their infrastructure, including cryotanks. The CIP Cryo-Vault's construction is being finalized in November 2024 and soon will be ready, with the necessary approvals, to receive safety copies from the countries in the region.

In 2023, 572 accessions of banana, cassava, potato and sweetpotato were cryobanked. Conservation protocols are under trial for taro, cassava, coconut, sweetpotato, yam, ulluco, oca and mashua, and for seed conservation of wild species of banana and potato. More than 2,000 genetically similar or potentially identical accessions have been identified and targeted for curation action. Results from joint genotyping of cassava collections at IITA and CIAT have indicated that there is greater redundancy within collections than between them.

Sustainable use

I. *Examples of CGIAR work on plant genetic resource characterization*

CGIAR genebanks accumulate data resources for diversity analyses, germplasm selection and collection management. More than 30 crops and 3,000 species are conserved. Their uses in research and breeding are wide-ranging. Approaches by individual genebanks to enriching data are mostly tailored to the specific crops and their potential uses. In 2023, activities included:

- digitizing seed and plant images, correcting and generating georeferences and other passport data for thousands of accessions, making updated data available online and on Genesys (www.genesys-pgr.org);

- generating genotypic data on potato crop wild relatives, banana, rice wild relatives, oca, ulluco and cassava to develop molecular atlases, carry out chromosome painting and diversity analyses, identify potential duplicates and taxonomic and subgroup classification;

- developing and evaluating 30 subsets of banana, barley, Buffel grass, lentil, potato, cassava, cowpea, sweetpotato, potato, wheat, yam and other crops to identify abiotic, biotic and nutritional traits in partnership with NARS and CGIAR breeders (e.g. for drought and heat tolerance, near-infrared reflectance spectroscopy (NIRS) profiling and resistance to numerous diseases, etc.);

- carrying out EnvGWAS for climate-related traits in wheat and sweetpotato, complementing the analyses funded by the Bill & Melinda Gates Foundation; and

- imaging rice panicles of 100,000 accessions to train an AI model to identify accession types, facilitating large-scale screening of collections for traits such as disease tolerance.

- Potato germplasm screening for resistance to the emerging disease, *B. cockerelli* (psyllid) vector of zebra chip and purple tip has been conducted by CIP team. A total of 32 accessions from Mexico (10), Peru (7), Ecuador (2), Bolivia (3), Colombia (6) and Argentina (4) were selected and propagated from in vitro seedlings. Materials were evaluated in 2023 and 2024 in northern Peru (Huancabamba), because the disease is already present in that region. Preliminary results showed that six accessions are resistance to the disease and can be immediately used by breeders.

II. Pre-breeding

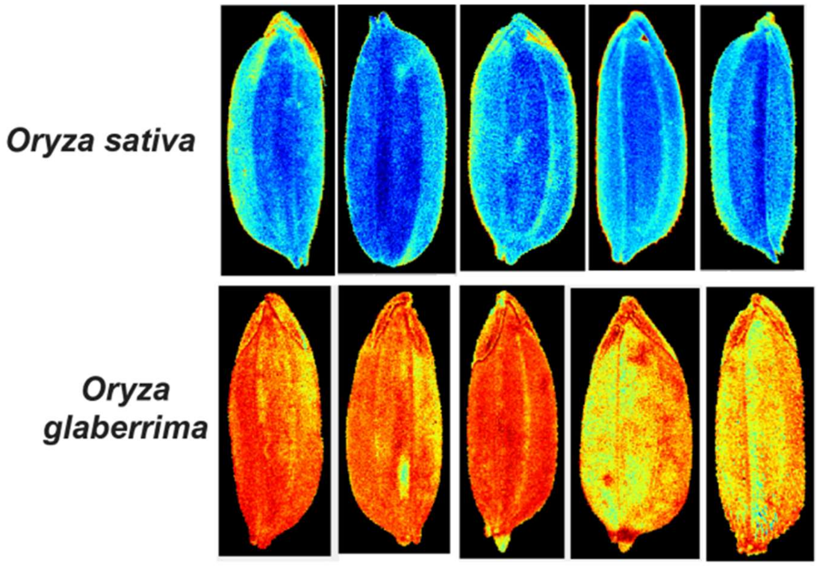
Collection curators work continually on data accuracy, integrity and recovery, on trawling accession data from grey and published sources, generating new data and creating tools to make it accessible.

For instance, Bioversity has developed a molecular atlas of banana accessions illustrated by chromosome painting.[102] Banana domestication is considerably more complicated than previously thought with up to seven wild Musa species contributing genetic diversity and traits to different cultivar groups, including at least one still unknown parent. The atlas will allow researchers to investigate unique sources of genetic variation in the collection for potentially useful traits. Similar molecular resources and catalogues are developed by other Centers.

A multispectral imaging technology, developed by a company in Denmark called Videometer, has been adopted by seven CGIAR genebanks and trained on eight crop species. In 2023, genebank technicians were trained and worked to build capacity to use the scanner and manage the generated images. More than 10,000 accessions of diverse crops have been imaged and models are being developed for characterization and classification. Procedures and terminology are also being harmonized. The new technology enables the high-definition characterization of seed morphology and color, which can be used in precise accession identification, taxonomic classification, assessment of health and viability, and evaluation of seed-related traits. For instance, the classifiers developed for rice at AfricaRice have 98 percent accuracy. GHUs are also adopting the same technology for pest and disease diagnostics.

Fgure 5: Species discrimination using VideometerLab software analysis

[102] https://alliancebioversityciat.org/stories/next-generation-catalog-cultivated-bananas



Source: CGIAR Research Initiative on Genebanks, Annual Technical Report 2023.

III. Genetic improvement

As anticipated in the previous section, GWAS, fine mapping, gene editing and genomic selection/prediction have become important tools in CGIAR pre-breeding and breeding programmes. Recently, CGIAR Centers that apply these tools have started collaboration with breeding programs in Africa, Asia and Latin America for their application in collaborative breeding with national programs. Some Centers have made great advances in this direction. For example, ICRISAT, together with partners from national agricultural research organizations from Asia and Africa, established and implemented trait mapping pipeline for crop breeding resulting in the development of 21 genomics-bred varieties and hybrids (12 in chickpea, 6 in groundnut and 3 in pearl millet) for release and commercial cultivation.

IV. Phytosanitary testing and cleaning

Every germplasm import and export, including from breeding programs, passed through CGIAR Germplasm Health Units (GHUs), which carried out more than 830,000 diagnostic assays and prevented the movement of more than 10,000 diseased or contaminated samples in 2023 alone, ensuring compliance with national phytosanitary regulations. In 2023, GHUs in nine CGIAR Centers also processed 212,465 accessions and 162,461 samples to facilitate 1379 import/export events with 134 countries, of which 59 percent were for CGIAR breeders and the rest for genebanks.

After successful collaboration between GHUs working on clonal crops to develop high-throughput sequencing of sRNA for virus diagnostics, protocols are mainstreamed and are enabling substantial gains in time taken for virus testing. However, this powerful technique is also revealing cryptic viruses about which little is known. GHU leaders are collaborating to address how to safely manage results provided by these hyper-diagnostic tools. Essential work is also being done to test new seed treatments as alternatives for recently banned substances.

Agenda item 4.2 Application of the Genebank Standards for Plant Genetic Resources for Food and Agriculture

Further to the approval of the Guidance Note for CGIAR Centers' Genebanks for Improving Accession Management in April 2022 (which was already presented in the CGIAR Report to the previous meeting of the Intergovernmental Technical Working Group), the Centers held a meeting to further discuss the curation process and experiences with use of the document 'Strategic accession management: An operational guide for CGIAR genebanks' (implementation guide). Following such meeting, which was held on 10 October 2023, a small drafting group, including experts from the Alliance of Bioversity and CIAT, ICARDA, CIP, and ICRISAT, developed a generic Curation Type Standard Operating Procedure (SOP), based on the Guidance Note (https://cgspace.cgiar.org/handle/10568/126835). The draft SOP was subsequently circulated among the Centers for their consideration and improvement. The SOP covers procedures that are needed for assigning and managing curation types for seed, in vitro and field genebank conservation, and it can be customized by genebank managers for specific crops and genebanks operations. In particular, it describes the following activities:

- Determination of accession curation type;
- Providing notice to the Plant Treaty and, in some cases, original provider countries, when deciding to archive materials;
- Changing accession management for different accession curation types; and
- Information management for accession curation type.

The release of an updated version of the said SOP is planned for 2025.

Agenda item 4.3 Effects of seed policies, laws and regulations

The CGIAR was invited, and contributed to the Fifth Meeting of the Ad Hoc Technical Expert Group on Farmers' Rights (AHTEG-FR-5) of the International Treaty, held from 24 to 26 June 2024 at FAO Headquarters, Rome, Italy.[103] Following this invitation, on 24th June 2024, a representative of the CGIAR delivered a presentation sharing the CGIAR experiences, practices, and lessons learned in facilitating and promoting the realization of Farmers' Rights.

The CGIAR also contributed publications relevant to the effects of seed policies, laws and regulations, such as an article that analyzed the sustainability challenge of community seed banks and identified strategies that address those challenges.[104]

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[103] At its Tenth Session, through Resolution 7/2023, the Governing Body of the International Treaty decided to reconvene the Ad Hoc Technical Expert Group on Farmers' Rights with the following terms of reference:
i) Review and agree to the outline for the assessment of the state of implementation of Article 9 of the International Treaty, as contained in Annex 1 of Resolution 7/2023, considering the compilation of the submissions;
ii) Review the assessment of the state of implementation of Article 9 of the International Treaty, and provide conclusions for the Eleventh Session of the Governing Body; and
iii) Provide advice to the Eleventh Session of the Governing Body on how the use of Options, as contained in the Annex to Resolution 7/2022 for the implementation of Article 9 of the International Treaty, can be promoted.

[104] Ronnie Vernooy et. al., "Promising Strategies to Enhance the Sustainability of Community Seed Banks," Sustainability 2024, 16(19), 8665; https://doi.org/10.3390/su16198665; see also the Policy brief: Conservation and sustainable use of agrobiodiversity – DCZ – Sino-German Agricultural Centre (dcz-china.org).

The Technical Expert Group ultimately agreed on the Outline for the Assessment, which references the CGIAR contributions in section 5, which states as follows:

"To complement the analysis, this section will include the work of different organizations and relevant bodies working on the promotion, protection and realization of Farmers' Rights, such as UN bodies, CGIAR Research Centers, farmers' organizations, Indigenous Peoples' and local communities' organizations, civil society organizations, academia and public and private sectors, operating at different levels."

The Plant Treaty Secretariat, CGIAR and the Alliance of Bioversity and CIAT co-organized a webinar entitled 'Understanding Farmers' Rights' on November 20, 2024. Representatives from civil society organizations, farmers' organizations and CGIAR Centers featured their work and shared their experiences and reflections in relation to the recognition and protection of farmers' rights.

Agenda item 5. Climate change and plant genetic resources for food and agriculture

The CGIAR Report to the Eleventh Session of the ITWG-PGRFA described examples of climate change-related work by CGIAR Centers,[105] focusing on the role of PGRFA in mitigating climate change, including work on developing plants with deeper, more extensive root systems; developing plants with biological nitrification inhibition; evaluating perennial grains; and breeding of varieties that facilitate adoption of low emission agronomic practices.

In 2023, by using artificial intelligence (AI), IRRI screened 60,000 rice samples for resilience to flooding.[106] This is three times more than were screened in the previous 52 years. Finding the most valuable samples in CGIAR genebanks has – until now – been a slow, expensive process. IRRI is changing this by using AI to accelerate the screening of its 132,000 rice samples. This will help identify varieties that can tolerate stresses like drought or flooding. It is part of a wider program to curate richer data and insight to help breeders, farmers and researchers make full use of CGIAR's unique collections.

Another relevant project focuses on the development of productive, nutritive, drought tolerant and anti-methanogenic feedstock and their deployment for reducing enteric methane emission from livestock systems in the Global South.[107] The project, whose implementation started in October 2023 and will continue until September 2028, embraces a unique partnership between science (involving 3 CGIAR centres namely ILRI, ICARDA and the Alliance of Bioversity and CIAT), philanthropy, and private sector partners to screen, develop, and deploy forages (legumes and grasses) enriched with anti-methanogenic compounds for use in livestock systems to cost-effectively reduce methane production in cattle rumen, while maintaining or improving forage and animal productivity.

Furthermore, IITA and ICARDA have developed heat and drought tolerant wheat varieties through conventional methods, including multi-location screening, shuttle breeding, double haploids, marker-assisted selection, key location phenotyping, and participatory testing.[108] Such varieties have already been released as regional public goods in eleven Africa countries, which makes that these cultivars can be further multiplied and cultivated without attracting royalties. Various other improved traits can be stacked in lines of wheat that possess heat stress tolerance, including high water use efficiency and immunity to diseases and pests like yellow stem rust.

Direct use of PGRFA conserved in CG genebanks also contributed to productivity increase and farmers resilience to climate change in Niger and Chad. Indeed, ICRISAT run a project on seed kits

[105] CGIAR Report to the Eleventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture is available at: www.fao.org/3/cc4983en/cc4983en.pdf.

[106] See 'Artificial intelligence helps unearth genebanks hidden gems', available at: https://www.cgiar.org/initiative-result/artificial-intelligence-helps-unearth-genebanks-hidden-gems/

[107] https://www.ilri.org/research/projects/low-methane-forage#:~:text=This%20project%20aims%20to%20use,compounds%20(AMC)%20for%20use%20in

[108] https://propas.iita.org/en/solutions/heat-and-drought-tolerant-wheat-varieties/79/details/

distribution to vulnerable household of Niger and Chad. Thus, pearl millet and sorghum accessions from ICRISAT Niamey regional genebank having adaptability and yield performance were multiplied and seed kits (5kg each) were distributed to over 2800 selected household in both countries. The seeds were planted during the rainy season in 2023 by farmers. Participative evaluation conducted in both Niger and Chad led to not only select the best performing (adaptation to climate, high yield, dual purpose, nutrition) accessions for each target location, but also increased peal millet and sorghum production by two-fold in most of the beneficiary farmers' fields.

In addition, CGIAR contributes to the Agriculture Breakthrough Agenda that was launched at UNFCCC COP-26 in 2021, with 17 signatory countries having joined the Agenda since then. The Agriculture Breakthrough Agenda aims to make sustainable, climate-resilient agriculture the most attractive and widely adopted option for farmers globally by 2030. Specifically, progress in the agricultural sector is measured against four guiding principles (called the agriculture breakthrough principles):

1. Sustainable increases in agricultural productivity and incomes, especially in low- and middle-income countries (LMICs).

2. Reduction in GHG emissions from the agrifood sector.

3. Improved soil, water resources, and natural ecosystems.

4. Improved adaptation and resilience to climate change, particularly for smallholder producers.

These principles guide the evaluation of international collaboration and technological progress in the sector.

In particular, CGIAR has led the development of the standalone 2024 Agriculture Breakthrough Report,[109] which focuses on reducing emissions, specifically in the two most impactful subsectors (i.e. livestock and fertilizer), while stressing that emissions reductions must not compromise food and nutrition security, particularly for the most vulnerable populations in the LMICs.

Additional information on CGIAR research and news related to climate change can be found on the Climate Adaptation & Mitigation Impact Area of the CGIAR Research Initiatives.[110]

[109] The '2024 Breakthrough Agenda Report – Agriculture', available at: https://www.cgiar.org/2024-breakthrough-agenda-report-agriculture/
[110] 'Climate Adaptation & Mitigation Impact Area', available at: https://www.cgiar.org/research/cgiar-portfolio/climate-adaptation-mitigation/