



Genebank
Platform



2020 | Genebank Platform Annual Plan of Work and Budget (POWB)



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Morocco and Lebanon



International Crops Research Institute for the Semi-Arid Tropics
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CGIAR Genebank Platform Plan of Work and Budget (POWB) 2020

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Narrative section

1. Adjustments/Changes to your Theories of Change

There are no adjustments to the Theory of Change for the Genebank Platform.

2. Plans and Expected Progress Towards Outcomes

As per previous years, the CGIAR Genebank Platform is responsible for providing healthy, viable, documented germplasm from the 35 crop and tree collections managed by the CGIAR, which are maintained and safety duplicated in long-term conservation in accordance with the FAO Genebank Standards (2014) and Article 15 of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty). This service remains the most important annual output of the 11 CGIAR genebanks, which together are expected to distribute approximately 100,000 samples of germplasm in response to requests from up to 2000 external users and CGIAR scientists in 2020.

A. Conservation Module

Aside from core operations, the genebanks and germplasm health units (GHUs) continue to work in 2020 towards performance targets and respond to recommendations from external reviews. This involves diverse activities including additional planting to regenerate crops and crop wild relatives, cleaning germplasm of pathogens, optimizing and documenting conservation protocols and introducing plant tissues into cryopreservation, as well training staff and completing upgrading work on labs, cold rooms and buildings.

There are also several activities that the genebanks and GHUs participate in as a group with expected outputs in 2020, including:

- **Efficiencies: technical and costing review**

Nine of the 11 genebanks have been subjected to cost reviews and six have undergone external technical reviews. Both types of review will be completed for all 11 genebanks in the first half of 2020. The reviews play an important role in validating the data reported annually on the status of collections and the individual quality management systems (QMS), which have been built and strengthened in the past five years. The two remaining years of the Genebank Platform represent an important time for the genebanks to address review recommendations and prepare for long-term partnership agreements to be funded by the Crop Trust endowment.

The findings of the reviews will be collated, and system-level implications will be considered in the second half of 2020 by a CGIAR-Crop Trust Technical Panel, with specific aims to:

- Consolidate the definition for genebank “essential operations”;
- Identify additional priority activities and needs for support for CGIAR genebank and germplasm health units;
- Agree general principles to facilitate the fair allocation of resources to CGIAR genebanks;
- Recommend further actions for improving cost-efficiency and rationalization within and between genebanks.

- **Efficiencies: Enhancing strategic curation and alignment of processes**

The CGIAR genebanks that manage crops in common (e.g. rice, wheat, maize, chickpea, others) will meet at a GOAL¹ workshop to compare key processes on specific crops and to determine ways to strengthen collaboration and complementarity through shared research projects, services or activities. A workshop was held in 2018 by CIAT and ILRI with a focus on tropical forages and resulted in an overhaul of processes and standards in both organizations. CIAT and ILRI are now implementing a process of rationalizing their respective collections to

¹ Genebank operations and advanced learning

ensure that priority species are available while less time and resources are devoted to accessions collected many years ago and which are of little interest as forage crops.

The Genebank Platform has developed a draft policy and shared framework to enable managers to make decisions regarding the strategic curation of collections. This policy helps define priorities for conservation and genebank activities, ensuring that the diversity of the international collection is maintained intact and in the securest possible conditions while allowing special collections (e.g. breeding materials), deprioritized accessions or other specific materials to be conserved temporarily or archived. This represents an important step towards a more dynamic conservation and use of crop genetic diversity in genebanks in general and is likely to result in changes in total accession numbers and status with respect to performance targets. The policy has been shared with the Plant Treaty for initial feedback, in line with the genebanks' Article 15 responsibilities.

- **Efficiencies: long-term conservation**

With the partnership of Aarhus University, some important changes have been made in CGIAR genebanks in seed handling to promote the longevity of viable seeds in storage. Given fresh, healthy, appropriately packed and dried seeds, the genebanks should reduce the need for monitoring and regenerating seed in the field, impacting considerably on costs. Commonly, genebank processes have been in place for decades. Making changes is not easy and has required careful consideration and experimentation as well as strengthened data management systems. A series of small research projects and expert interventions have helped catalyze change, which will continue in 2020 and 2021 with four working groups focusing on dormancy-breaking, imaging, longevity in storage and post-harvest handling. In 2020, a report will be produced summarizing several decades of historical viability data gathered from across the system.

All four genebanks working on clonal crops are meeting regularly as a community of practice (CoP) to strengthen strategies for medium- and long-term conservation of vegetatively propagated crops. An important focus of their discussions is to highlight the need for increased funding on cryopreservation. Thanks to support from the Genebank CRP and Platform, CIP has now cryopreserved more than half of the clonal potato collection, which allows them to vastly improve safety duplication and long-term conservation processes and reduce the reliance on field and *in vitro* collections. While some funding is provided from the Genebank Platform to develop further cryopreservation protocols for yam and sweetpotato, it is not enough. Building a "cryopreservation platform" will support skilled teams and large-scale implementation of cryopreservation of clonal crop collections managed by the CGIAR and other genebanks. The Government of Belgium has already indicated its support for cryopreservation by proposing to the Governing Body of the Plant Treaty at its 2019 session to establish a facility to host cryopreserved safety duplicates in Belgium managed by Alliance-Bioversity.

- **New long-term partnership agreements (LPA)**

Pending 2019 reporting and confirmation on the status of crop collections, up to three new long-term partnership agreements may be negotiated in 2020 with genebanks that are approaching or sustaining performance targets. Currently, only IRRI has been able to negotiate and benefit from assured long-term funding when their LPA was signed in 2018. Thanks to the work supported by the Genebanks CRP and Platform, most of the other genebanks are now approaching targets, which means they will become eligible to receive long-term support for essential operations from the endowment mechanism in the next two or three years.

- **Germplasm Health Units**

The UN has designated 2020 as the International Year of Plant Health (IYPH). The GHU Community of Practice (CoP) will hold a special event at the International Plant Protection Convention's (IPPC) 15th Commission on Phytosanitary Measures in March in Rome. Further events will be organized in partnership with the IPPC and National Phytosanitary Organizations to promote the IYPH focusing particularly on the role of GHUs in transboundary pest prevention in germplasm.

As the costs and status of genebanks are under heavy scrutiny, the focus is expected to turn next to GHUs. In preparation the GHU CoP will undertake a survey to understand better the priorities and the nature of bottlenecks in providing phytosanitary controls to genebanks, breeders or other programs. Individual GHUs will be subjected to a cost analysis and all locations from which CGIAR units, genebanks or programs carry out international germplasm distributions will be mapped and assessed in terms of pathogen risk management.

- **Partnership with NARS and collecting**

Following studies to analyze geographical and trait gaps in existing CGIAR collections over the past three years, the Genebank Platform will launch an initiative in 2020 to collect crop diversity in target locations in under-represented countries. Priority countries who have expressed an interest to partner with the CGIAR-Crop Trust include Madagascar, Togo, South Sudan, Sudan, Niger, Chad, Eritrea, Mali, Mauritania, Kyrgyzstan, Tunisia, Myanmar, Papua New Guinea, Belize and Guyana. The projects will start in 2020 and be focused on capacity building and enabling the two-way flow of germplasm between CGIAR genebanks and partners. Gap analysis tools already developed will be used to suggest accessions potentially suited to the expressed needs of national partners. Funding will be targeted at providing support for collecting and conservation activities in the partner countries.

B. Use Module

- **GRIN-Global Community Edition**

The Genebank Platform created a CoP on Data Management to implement a coordinated and targeted workplan across all Centers to develop shared software tools for the management and use of genebank collections. Current technical reviews are still highlighting the shortfalls in existing systems, which continue to deploy multiple platforms and software to manage data on different crop collections in the genebank. The new initiative will facilitate the adoption of one system, GRIN-Global Community Edition, for all operations from curation to germplasm ordering and all crops in as many genebanks as possible. An important goal will be to use some of the best practices, workflows and solutions in place in different genebanks, including Genesys, to design and build the new system for all.

- **Promoting use of collections**

Three projects are under way in 2020 and 2021 to tackle the challenges of directing users towards diversity that has the traits they are looking for and to facilitate more effective management of ever-growing collections:

- Genetic sequence data from cassava collections at IITA and CIAT are being analyzed to determine diverse subsets, identify redundancy between and within the collections and to provide marker datasets for association mapping;
- Sequence data from collections in seven genebanks are being analyzed to examine within accession heterogeneity and to establish principles for sampling genebank accessions in general;
- CIAT and ICARDA are developing a tool that will allow genebank managers and users to build customized subsets based on environmental criteria using well-established data mining approaches. The subsetting tool will be applicable to any set of accessions with passport and characterization data and will be available via the Genesys portal.

- **Genebank impacts**

In 2018, a Genebank Impacts CoP was established in partnership with Michigan State University to deliver a set of impact studies using findings from six genebanks (CIMMYT, IRRI, CIP, ILRI, ICRAF, and Bioversity). The findings will be published in a special issue of *Food Security* in 2020. Building on the momentum of the first cohort of fellows, five new projects (with IITA, ICRISAT, AfricaRice, ICARDA, and CIP) will be rolled out in 2020 and 2021 to look at the importance of crop diversity managed by CGIAR genebanks in varietal development in developing countries.

C. Policy Module

- **Ensuring Centers' compliance with genetic resources laws and policies**

In 2020, the Policy Module will develop "Guidelines for Centers' Operations under the Plant Treaty". These guidelines will incorporate an updated version of the 'Centers Guide to the SMTA, 2009', and cover a broader range of issues that are linked to Centers' operations under the Plant Treaty, including the use of licenses when passing on improved materials that are derived from Multilateral System (MLS) materials, intellectual property rights over such materials, and reporting on those licenses and IP applications under the framework of the CGIAR Principles on the Management of Intellectual Assets to the CGIAR System Office and Plant Treaty's Governing Body. These are issues that have received critical attention at the level of the Plant Treaty's Governing Body, CGIAR System Council IP Group and System Management Board (SMB). These guidelines aim to raise awareness of the increased scrutiny on these issues, ensure compliance with obligations and lower transaction costs.

Addressing this same objective, the Policy Module will develop and publish additional tools for CGIAR scientists including instructional videos, scenarios for genebanks and breeders, Q&A, policy compliance decision-making trees, model germplasm acquisition agreements, etc. A helpdesk is open to requests and the Policy Module will organize a capacity building workshop for CGIAR scientists and closely associated partners on compliance with genetic resources policies.

The Policy Module will also lead in the development of a CGIAR Statement on the use of genomic or digital sequence information (DSI) which includes guiding principles for CGIAR Centers carrying out sequencing activities. The Policy Module will liaise with a wide range of scientists across CGIAR in the process.

- **Coordinating CGIAR engagement in intergovernmental genetic resources policy fora**

Last year ended with the suspension by the Plant Treaty's Governing Body of the negotiations to enhance the multilateral system of access and benefit-sharing (MLS). A number of contracting parties, stakeholders and the Secretariat are considering ways to build on the progress that had been made during the six years of negotiation, with the possibility of formally relaunching the process to enhance the MLS in 2021. The Policy Module will monitor and participate in these consultations over the course of 2020 to consider how to address the substantive issues that thwarted the negotiations (i.e. how to address benefit sharing associated with the commercial use of DSI and the level of benefits that commercial users should pay into the benefit sharing fund).

International attention is now turning to 2020 negotiations under the Convention on Biological Diversity (CBD) which are looking at benefit-sharing and DSI and developing the Post 2020 Global Biodiversity Framework. The Policy Module will coordinate CGIAR representation at those meetings, and continue to make science-based contributions, to: a) promote implementation of the Plant Treaty in the Post 2020 framework, and b) develop norms concerning DSI that support continued accessibility and facilitated use of DSI for agricultural research and development consistent with the CGIAR mission. To this end, in 2020, the Policy

Module will coordinate CGIAR' submissions and participation in expert working groups under the framework of the CBD, and ultimately the 15th Conference of the Parties.

3. Financial Plan for the coming year, including use of W1/2

The use of W1/2 strictly follows the Genebank Platform proposal. In 2019, the Crop Trust provided USD 10.95 million in funding to the Genebank Platform, including income from the endowment and funds raised from bilateral donors. The expected contribution from the Crop Trust to the Genebank Platform in 2020 is USD 13.35 million. As the endowment annual income does not yet meet this level, the Crop Trust will need to raise additional funds (approximately USD 4 million) this year to meet its commitment.

TABLES

Table 2A: Planned Milestones

Module	Mapped to Sub-IDO	2022 Module outcomes	Milestone	Choose one of the following: Milestone 1) Identical to proposal 2) Reworded/ rephrased from proposal 3) New/changed	Means of verification	CGIAR Cross-Cutting Markers for the milestone 0=not targeted; 1=significant; 2=principal N/A = not applicable			
						for gender	for youth	for CapDev	for CC
Module 1: Conservation	Increased conservation and use of genetic resources	Outcome 1.1 Disease-free, viable, documented germplasm made available	1. 81% accessions available 2. 62% seed accessions safety duplicated 3. 75% clonal accessions safety duplicated	1	Genesys Online reporting and external validation	N/A	N/A	N/A	N/A
		Outcome 1.2 Crop diversity conserved in a rational and effective global system	4. Historical viability re-testing data collated and analyzed	1	Special report	N/A	N/A	1	N/A
			5. Representation of 22 crop gene pools in <i>ex situ</i> conservation quantified	1	Diversity trees on Genesys			1	
		6. Comprehensive revised cost analysis	1	Report on cost analysis			1		

Module	Mapped to Sub-IDO	2022 Module outcomes	Milestone	Choose one of the following: Milestone 1) Identical to proposal 2) Reworded/ rephrased from proposal 3) New/ changed	Means of verification	CGIAR Cross-Cutting Markers for the milestone 0=not targeted; 1=significant; 2=principal N/A = not applicable			
Module 2: Use		Outcome 2.0 More effective access and use of germplasm enabled	7. Novel query interfaces available based on phenotypic, genetic and environmental data linked to genebank accessions	1	Genesys	N/A	N/A	1	N/A
			8. At least 3 focal subsets assembled and genotyped by each genebank	1				1	
Module 3: Policy		Outcome 3: Supportive policy environment developed	9. Centers policy compliance decision making tool	1	Reports	N/A	N/A	1	N/A
			10. CGIAR annual report on intellectual assets management and Centers' public disclosures about licenses and IP applications for improved germplasm include information relevant to Plant Treaty's Governing Body	1				1	
			11. Reports to CBD/Nagoya Protocol COP, and expert working groups	1				1	

Table 2B: Planned Evaluations/Reviews, Impact Assessments and Learning Exercises

Platform	Module (if not overall Platform)	Status (ongoing, new)	Planned studies/learning exercises in the coming year	Geographic scope	Who is commissioning this study
Genebank	Conservation	New but related to ongoing activity	Costing reviews of IITA and AfricaRice genebanks in 2020 complete the exercise for all 11 genebanks. Costs across all genebanks will be assessed in joint CGIAR-Crop Trust system-level review.	Global	Platform management
	Conservation		Document audits of information management and collecting Standard Operating Procedures (SOPs) will be carried out in nine genebanks.		
	Conservation		External technical reviews and validation of quality management systems (QMS) at five genebanks (ICRISAT, Bioversity, AfricaRice, ICRAF, ILRI) will complete this phase of technical review for all 11 genebanks.		
	Conservation		Genebank Operations and Advanced Learning and other capacity building workshops are planned.		
	Use		Five impact fellows will conduct short studies with IITA, ICARDA, AfricaRice, ICRISAT and CIP genebanks.		

Table 2C: Planned major new collaborations (CGIAR internal, or with non-CGIAR collaborators)

Name of Platform/CRP or non-CGIAR collaborator	Brief description of collaboration (give and take among CRPs/Platforms/non-CGIAR collaborator) and value added (e.g. scientific or efficiency benefits)
AFS CRPs	As usual the Policy Module will be working across the System to address the need for general compliance with Plant Treaty obligations. More particularly in 2020, CGIAR will need to respond to Resolution 12 of 8 th Governing Body concerning cooperation between the Plant Treaty and the CGIAR with respect to joint capacity building projects to support Plant Treaty implementation, reporting on Centers implementation of the CGIAR IA principles, and minting Global Information System Digital Object Identifiers (GLIS DOIs) on improved materials distributed by CGIAR Centers with an SMTA.
EiB Platform	In 2020, Germplasm Health Units will conduct a survey for breeding programs and genebanks on bottlenecks and priorities in phytosanitary processes in coordination with EiB.
Big Data Platform	Genebank Platform technical and policy staff are participating in the development of CGIAR Digital Strategy.
Non CGIAR	<p>Joint CGIAR-NARS capacity building and collecting projects are planned in 15 target countries (Madagascar, Togo, South Sudan, Sudan, Niger, Chad, Eritrea, Mali, Mauritania, Kyrgyzstan, Tunisia, Myanmar, Papua New Guinea, Belize and Guyana). CGIAR partners will contribute to capacity building of five national genebanks in Ethiopia, Nigeria, Kenya, Ghana and Zambia in a Crop Trust-coordinated project funded by the German Government.</p> <p>Diverse projects will be initiated or renewed involving research on seed quality management with Aarhus University and impact assessment with Michigan State University.</p> <p>Close collaboration and interactions are planned between CGIAR GHUs and International Plant Protection Convention Secretariat and members in the International Year of Plant Health.</p>

Table 3: Planned Budget

	Planned budget				Comments on major changes
	W1/2	W3/bilateral	Center Own fund	Total	
Module 1	13.53	12.38	0	25.91	
Module 2	0.27	0.97	0	1.24	
Module 3	0.78	0	0	0.78	
Platform Management & Support Cost	0.69	0	0	0.69	
Platform Total	15.27	13.35	0	28.62	