



**Food and Agriculture  
Organization of the  
United Nations**



**The International Treaty**  
**ON PLANT GENETIC RESOURCES  
FOR FOOD AND AGRICULTURE**

## **Item 15.2 of the Provisional Agenda**

### **EIGHTH SESSION OF THE GOVERNING BODY**

**Rome, 11–16 November 2019**

### **Report of the Global Crop Diversity Trust**

#### **Note by the Secretary**

Pursuant to Article 3 of the Relationship Agreement with the Global Crop Diversity Trust (Crop Trust), the Executive Board of the Crop Trust regularly submits reports on the activities of the Crop Trust to the Governing Body of the International Treaty. At its Seventh Session, by Resolution 10/2017, the Governing Body provided policy guidance to the Global Crop Diversity Trust regarding its work.

The report contained in the Appendix to this document provides an update on the institutional and programmatic developments of the Global Crop Diversity Trust that occurred during this biennium. Issues related to the cooperation with the Global Crop Diversity Trust are reported in a separate document before the Governing Body, which also contains draft elements for a Resolution as possible policy guidance to the Global Crop Diversity Trust for the next biennium.<sup>1</sup>

#### **Guidance Sought**

The Governing Body is invited to take note of the Report of the Global Crop Diversity Trust contained in the Appendix to this document, and to consider it in providing policy guidance to the Global Crop Diversity Trust for the biennium 2020-21.

<sup>1</sup> *Cooperation with the Global Crop Diversity Trust (IT/GB-8/19/15.2)*



## Report of the Global Crop Diversity Trust to the 8th Session of the Governing Body of the International Treaty on PGRFA

### A. INTRODUCTION

The Global Crop Diversity Trust (Crop Trust) was established in 2004 as an independent international organization under international law. It operates 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 its Governing Body. 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 Relationship Agreement between the Crop Trust and the Governing Body of the Treaty recognizes the Crop Trust "as an essential element of the Funding Strategy of the International Treaty in relation to ex situ conservation and availability of plant genetic resources for food and agriculture." It notes that the Crop Trust has established an endowment with the objective of "providing a permanent source of funds to support the long-term conservation of the ex situ germplasm collections on which the world depends for food security." The Agreement refers to the call in the first Global Plan of Action for Plant Genetic Resources for Food and Agriculture (Global Plan of Action) for the "development and support of a rational, efficient and sustainable system of genetic resources collections around the world."

The Crop Trust addresses major portions of the Treaty, including Articles 5 and 6, and much of Articles 7, 8, 14, 16, and 17. At its 7th Session in October/November 2017, the Governing Body approved Resolution 10/2017, Policy Guidance to the Global Crop Diversity Trust. The areas that the Governing Body selected for policy guidance are: resource mobilization, scientific and technical matters; the Global Information System; and communication and outreach. The Crop Trust is pleased to submit this report on both institutional and programmatic developments that occurred in the biennium 2017-2019 to the 8th Session of the Governing Body of the Treaty. The above key areas for policy guidance are addressed in the report.

### B. SCIENTIFIC AND TECHNICAL MATTERS

#### *A. Global crop conservation strategies*

Between 2004-2010, the Crop Trust gathered together groups of experts to develop a series of global crop conservation strategies, to help guide its support for the development of an effective and efficient global *ex situ* conservation system.<sup>2</sup> As the Governing Body recognized that the crop strategies are key guiding documents to rationalize ex situ conservation and to build collaboration, during the past biennium the Crop Trust actively explored funding opportunities to support their continuous updating on a rolling basis. A project proposal was submitted to the Federal Office for Agriculture and Food (BLE) of Germany, with the endorsement and support of the Treaty Secretariat, and was approved in mid-2019. The Crop Trust has also collaborated with a project being supported by the Treaty Secretariat and implemented by CIAT to develop a crop-based metric synthesizing information on use, interdependence, PGRFA demand and supply, and vulnerability. New global strategies for apple, coffee and tea have been finalized. In addition, various activities under the new CGIAR Genebank Platform build on, and update, the relevant global crop conservation strategies (see below).

#### *B. Long-term conservation and availability of PGRFA*

At the core of the Crop Trust is the endowment fund (see below), created to provide financial security to globally important collections of crop diversity in perpetuity. To date, the Crop Trust has approved long-term grants from the endowment to 10 Article 15 collections, i.e. 9 of the CGIAR genebanks and

<sup>2</sup> All completed strategies are available here: <https://www.croptrust.org/resources/>

the genebank of the Pacific Community (SPC). In total, long-term grants since 2006 have amounted to USD 37.8m.

In 2019, the Crop Trust is committed to provide USD 11.53 million for the essential operations of the international genebanks under the CGIAR Genebank Platform, up from USD 9 million in 2018. The Crop Trust's contribution to the CGIAR genebanks will continue to rise each year until the end of 2021 as allocations from CGIAR correspondingly decrease. In addition, the Crop Trust is committed to providing long-term support to the Svalbard Global Seed Vault, another key component of the global system.

The funding provided by the Crop Trust from the endowment and via the CGIAR Genebank Platform is thus partially supporting the conservation and availability of 20 international Article 15 collections of 17 major crops.<sup>3</sup> In the case of rice, since October 2018 the Crop Trust endowment has been fully supporting the basic operations of the genebank at the International Rice Research Institute (IRRI), an important milestone and proof-of-concept of the endowment approach.

#### *The CGIAR-Crop Trust Genebank Platform*

In 2017, funding for the routine activities of all 11 CGIAR genebanks (AfricaRice, Bioversity, CIAT, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IITA, ILRI, and IRRI) was secured through the continued partnership of CGIAR and the Crop Trust on the CGIAR Genebank Platform, complementing the long-term grants from the endowment. The 6-year Genebank Platform (recently shortened to 5 years) took over from the Genebanks CGIAR Research Program (CRP), which ran from 2012-2016. The Genebank Platform, managed by the Crop Trust together with the CGIAR genebank managers, aims to increase efficiencies and enhance quality management, optimize conservation protocols, develop data management systems and actively promote the use of the collections.<sup>4</sup> Further details on the work of the CGIAR genebanks is available in the report provided by CGIAR.

The genebank figures presented below were extracted from the Online Reporting Tool (ORT) in July 2019, covering the calendar year 2018. The ORT has been developed by the Crop Trust to monitor progress of the genebanks towards performance targets.

1. The CGIAR genebanks presently manage 773,112 accessions, including 25,576 in vitro and 32,212 held in the field. Approximately 80% of these are immediately available for international distribution. This continues the steady increase in the availability of accessions since the Genebanks CRP was launched in 2012, and is particularly significant when the ongoing distribution and acquisition of samples is taken into account.
2. Of the seed accessions, 57% is secured in safety duplication at two levels, and 72% of accessions of clonal crop collections is safety duplicated in the form of in vitro or cryopreserved samples.
3. 100% of the accessions have passport or characterization data accessible online; 97% have a Digital Object Identifier (DOIs).
4. Some 96,566 germplasm samples were provided by CGIAR genebanks to users in 2018 and 109,339 in 2017; in 2018, 40,173 distinct accessions were provided to users within CGIAR and 56,393 were distributed outside CGIAR directly to advanced research institutes and universities (32%), NARS (50%) and to farmers and the private sector (10%) in 87 countries. These germplasm flows represent the bulk of global distributions using the SMTA.

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<sup>3</sup> Crops supported by the Crop Trust through long-term grants are: banana/plantain, barley, common bean, cassava, chickpea, edible aroids, faba bean, forages, grasspea, lentil, maize, pearl millet, rice, sorghum, sweetpotato, wheat, and yam.

<sup>4</sup> <https://www.genebanks.org/>

Two initiatives under the Genebanks CRP focused on ways to improve the longevity of germplasm in storage and thereby the efficiency of genebank operations:

1. CIP continued to make major strides in cryobanking on a large scale. A team of technicians have been trained and workflows developed, allowing more than 450 potato accessions to be cryopreserved per year to stringent quality standards. This will enable much more effective and more economical safety duplication of the collection as a whole and rationalization of the field and in vitro collections.
2. Seed conservation specialists toured the CGIAR genebanks to review historical viability testing data and current practices. Findings suggest significant improvement can be made in both seed management practices and resulting seed longevity, and some of these recommendations are being implemented.

The CRP supported the construction of a new AfricaRice genebank in Côte d'Ivoire, a process which the Crop Trust has facilitated. The original plan was for the genebank building in Cotonou to be dismantled and physically moved to Bouake but, after advice from genebank experts made available through the Crop Trust, the center decided to construct an entirely new building. This has now been completed, and the collection moved.

Nine genebanks follow the "Genebank QMS", a tailored quality management system being developed by the Genebank Platform and the Global Crop Diversity Trust. In 2018, the Genebank QMS expanded its basic areas of QMS to include eight elements which are documented, audited and improved periodically. The Genebank Platform has supported capacity building for QMS for scientists and research managers from both CGIAR Centers and national agricultural research programs. At least one Genebank Operations and Advanced Learning (GOAL) workshop is coordinated annually. All 11 international genebanks of CGIAR have undergone review by external experts since the beginning of the Genebanks CRP, and are now undergoing a second round of reviews under the Genebank Platform, which will be finished in 2020.

#### *Measuring the representativeness of crop genetic diversity conserved ex situ*

As part of the Conservation Module of the Genebank Platform, activities are underway to analyze and quantify the representativeness of genebank collections, and thereby identify coverage gaps, complementarities among collections (including NARS), and priorities for further collecting.

For 22 crops, the Genebank Platform is applying a 'diversity tree' approach<sup>5</sup> to document what fraction of the total genetic diversity of a crop gene pool is represented in a collection by dividing the gene pool into hierarchical clusters according to published literature and expert knowledge. Such diversity trees provide a summary of the genetic diversity within a crop gene pool and are used to (a) identify gaps in the collections and (b) to provide measures of coverage of the representation of crop genetic diversity in ex situ collections that go beyond the total size of collections and the estimated unique accessions for each crop.

The Genebank Platform is also conducting a spatial analysis of the geographical coverage of collections of landraces of selected crops in order to inform future collecting. Finally, ICARDA is conducting a trait analysis to identify sites and regions where traits of interest (for example resistance to a specific disease) are most likely to occur.

The results of these activities will be used to guide further collecting, update and create new global crop conservation strategies and to identify NARS collections that are complementary with CGIAR collections, as recommended by the Governing Body (Resolutions 8/2015 and 10/2017).

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<sup>5</sup> Van Treuren, R., et al. (2009) "Optimization of the composition of crop collections for *ex situ* conservation." *Plant Genetic Resources: Characterization and Utilisation* 7(2): 185-193.

### *Crop Trust support to national genebanks*

#### The CWR Project

In 2011, the Crop Trust launched a 10-year global initiative to support countries to collect high-priority diversity of the wild species related to 29 Annex 1 crops, to secure that diversity for the long-term under the Treaty, and to use it to prepare materials useful to breeding programs around the world in adapting these crops to climate change. The project, “Adapting Agriculture to Climate Change”, is funded by the Government of Norway and guided by an Advisory Group comprising subject-matter experts including the Treaty Secretariat as an observer. It is being implemented in partnership with the Millennium Seed Bank (MSB) of the Royal Botanic Gardens, Kew, UK and with specialist institutes and national and international conservation and pre-breeding programmes around the world.

Following a taxa prioritization exercise, collecting and conservation of CWRs were supported in national programs in 25 countries.<sup>6</sup> These partnerships included significant technical backstopping activities. As of July 2019, 4,628 samples from 370 taxa in 27 genera have been collected and are being conserved by 26 partners in 25 participating countries. Data from this collecting work is now available on a dedicated Genesys page.<sup>7</sup> Close to 3,000 accessions (of 25 genera) have been sent to MSB for conservation and distribution to international genebanks. As of December 2018, 2,414 collections from 1,748 unique accessions of 143 species have been safety duplicated and further distributed to 5 additional genebanks. The collecting work has now ended, and the focus is on pre-breeding and evaluation of pre-bred materials.

Pre-breeding projects are underway, or have been concluded, on 19 crops, with all materials developed being made available under the Treaty. Pre-breeding projects involve a total of some 62 national and international partners in 34 countries and all include a strong emphasis on capacity building. Appendix A provides an overview of pre-breeding projects.

In addition, evaluation projects are supported in 37 countries, with 58 partners, for 13 crops (12 project agreements in total). Activities of evaluation projects typically focus on multiplying seeds of pre-bred lines, advancing introgression lines for additional generations and evaluating materials for traits of interest. Whenever possible, farmer participation is supported. A 2017 study by the Norwegian University of Life Sciences (NMBU), entitled *From base broadening to enhancing crop adaptation to climate change: a preparatory study for the farmer evaluation activity in the project ‘Adapting Agriculture to Climate Change: Collecting, Protecting and Preparing Crop Wild Relatives,’* helped to prioritize crops and identify partners. Appendix B provides an overview of pre-breeding evaluation projects.

The results of pre-breeding and evaluation efforts will be made available proactively to: (1) ongoing, impactful breeding programs aimed at helping poor farmers in developing countries increase food production and quality, and (2) on-farm PGRFA management efforts and the farmers that benefit from them.

An ongoing project collaboration with the James Hutton Institute (JHI) is also underway to address the data management needs of the pre-breeding projects using the Germinate 3 software. All users of the database will be encouraged to use the DOI system, as implemented by the Treaty’s Global Information System.

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<sup>6</sup> Armenia, Azerbaijan, Brazil, Chile, Costa Rica, Cyprus, Ecuador, Ethiopia, Georgia, Ghana, Guatemala, Italy, Kenya, Lebanon, Malaysia, Nepal, Nigeria, Pakistan, Peru, Portugal, Spain, Sudan, Uganda, Vietnam and El Salvador

<sup>7</sup> <https://www.genesys-pgr.org/project/CWR/overview>

Towards the end of 2018, the CWR Project commissioned an external review for an independent assessment of the effectiveness, efficiency, relevance, impact, and sustainability of its different activities. This yielded a set of useful and largely positive recommendations which are now being implemented. At the completion of this third and final phase, at the end of 2020, the project aims to have made available under the Treaty a range of new and exciting adaptive options for agriculture that might otherwise have been lost, whilst helping protect biodiversity from irrevocable loss. The project will also have helped build capacity in developing countries and will have produced valuable information to assist complementary on-farm and in situ efforts.

### Capacity building

Drawing on resources from both the Genebank Platform's QMS initiative and the CWR Project, the Crop Trust organized a series of Genebank Operations and Advanced Learning (GOAL) workshops in the biennium at MARDI, Malaysia with support from the Crawford Fund (2017 and 2018) and IICA, Costa Rica (2018). Staff from national genebanks from 26 countries<sup>8</sup> attended. These GOAL workshops offer an excellent medium for raising and aligning standards not just across the CGIAR genebanks, but also beyond, to national partners.

### Emergency grants

The Crop Trust implemented a number of emergency grants in the biennium, in collaboration with:

1. the national genebank of Nepal for the collection, conservation, and restoration of native crop seeds in earthquake-affected areas (March 2018).
2. the Kenya Agricultural and Livestock Research Organization (KALRO) for the refurbishment and upgrading of the conservation facilities at the Genetic Resources Research Institute (GeRRI), with support from Irish Aid (September 2018).
3. SPC for post-cyclone recovery of the genebank, with support from AusAID, Australia (June 2019).

### National Seeds Collections for Climate-Resilient Agriculture in Africa (Seeds for Resilience)

Recognizing the important role national genebanks play in the global system of ex situ conservation, and in the context of adapting agriculture to more challenging conditions, the Crop Trust sought during the biennium significant project- funds to support national genebanks in developing countries. Thanks to the Government of Germany, we have been able to initiate in mid-2019 a new 5 year project: 'Seeds for Resilience'. The project aims to: (1) prepare key national ex situ collections of PGRFA in Africa to be eligible to receive long-term support; and (2) strengthen links between these genebanks and their users.

During the proposal development phase, a study was commissioned to better understand the uniqueness and size of national collections worldwide. Taking donor preferences into account in addition, 5 national genebanks in Africa were finally approached with a partnership offer. All are in countries that are either signatories to, or have ratified, the Treaty. Following the model of the Crop Trust's work with CGIAR genebanks, a systematic review process of genebanks operations will now be undertaken, performance targets will be established and capacity building and upgrading activities will take place. The project will also foster collaboration among national and international genebanks, thereby strengthening these two pillars of the global system of ex situ conservation. At the end of the project, a second round of reviews will be conducted to determine the outcomes of the upgrading and capacity building work, measure progress against, an assessment of performance targets and assess the eligibility of genebanks to receive long-term support from the Crop Trust endowment fund. Selected

<sup>8</sup> Argentina, Australia, Bhutan, Bolivia, Chile, Colombia, Costa Rica, Cuba, Ecuador, Fiji, Guatemala, India, Laos, Malaysia, Mexico, Mongolia, Myanmar, Nepal, Pakistan, Peru, Philippines, Sri Lanka, Taiwan, Uruguay, Venezuela, Vietnam

qualifying partner genebanks may then receive long-term support for a portion of their annual operating expenditures.

#### The Svalbard Global Seed Vault

The Treaty cites the need “to take appropriate steps to minimize or, if possible, eliminate threats to PGRFA” (Article 5.2) and the Second Global Plan of Action has as an objective “to provide for the planned replication and safe storage of materials not currently safety duplicated”. Safety duplication is recognized by the FAO Genebank Standards for PGRFA as an essential element of good genebank management practice aimed at minimizing risk to ex situ collections. The Crop Trust supports the duplication under black-box conditions of the world’s most important crop collections at the Svalbard Global Seed Vault as an ultimate safety net. A new 10-year agreement was signed in 2017 between the Crop Trust, the Government of Norway and NordGen for the management of the Svalbard Global Seed Vault.

By the end of 2018, 983,524 accessions had been safety duplicated in Svalbard by 76 institutes.<sup>9</sup> In 2018, 92,638 new safety duplicates were deposited by 30 genebanks, making it the busiest year since 2011, in terms of deposited seed samples and participating institutes. One important reason for the high numbers was a specific invitation to genebanks to take part in a major seed deposit event during the celebration of the Seed Vault’s tenth anniversary. By the end of 2018, NordGen had signed Deposit Agreements (DA) with 85 institutions. Six new institutions in Slovakia, Portugal, Chile, Thailand, the United Kingdom and Latvia signed the Deposit Agreement in 2018. Twelve of the current 76 depositors are international genebanks, 52 are national genebanks, 2 are regional genebanks, 6 are university genebanks and 3 are NGO genebanks.

ICARDA, previously located in Aleppo, Syria, became the first depositor to ask for deposited seeds to be returned. Since 2016, ICARDA has been regenerating large numbers of accessions retrieved from the Seed Vault. It has already re-deposited about 43,000 accessions including both new and “old” materials, back into the Seed Vault on four occasions since their first withdrawal in September 2015. The regeneration continues with support from the Genebanks Platform. A film that documents ICARDA’s efforts was broadcast in 2018.<sup>10</sup>

### C. C. STRENGTHENING INFORMATION SYSTEMS FOR GENE BANKS

Article 17.1 of the Treaty requires that Contracting Parties “cooperate to develop and strengthen a global information system to facilitate the exchange of information, based on existing information systems, on scientific, technical and environmental matters related to plant genetic resources for food and agriculture, with the expectation that such exchange of information will contribute to the sharing of benefits by making information on plant genetic resources for food and agriculture available to all Contracting Parties.” Articles 13.2(a) and 12.3(c) address requirements to make information available. Priority Activity 15 of the Second Global Plan of Action calls for “Constructing and strengthening comprehensive information system for plant genetic resources for food and agriculture”.

CGIAR and the Crop Trust are continuing to support the implementation of two initiatives to enhance the management and availability of information about PGRFA: GRIN-Global<sup>11</sup> and Genesys<sup>12</sup>. Close collaboration with the Treaty’s Global Information System (GLIS) in the biennium has focussed to building synergies and complementarities within the Governing Body-approved Program of Work. As DOIs have been established as a priority area for GLIS on the advice of the Scientific Advisory Committee (the Crop Trust has participated in all its meetings), the Crop Trust has facilitated the

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<sup>9</sup> Full details of holdings may be found at: <http://www.nordgen.org/sgsv/>

<sup>10</sup> <https://www.arte.tv/en/videos/080754-000-A/seeds-of-war/>

<sup>11</sup> <https://www.grin-global.org/>

<sup>12</sup> <https://www.genesys-pgr.org>

adoption of DOIs for genebank material by the CGIAR genebanks and implemented support for DOIs in Genesys in 2018. Today, over 800,000 accessions on Genesys are identified with a GLIS-minted DOI.

During the biennium the Crop Trust organized two “Genesys & GRIN-Global workshops” for CGIAR and national genebanks at CIMMYT in 2017 and in Portugal in 2018. A GRIN-Global Workshop for European Genebanks was organized in cooperation with ECP/GR in the Czech Republic in 2017.

#### GRIN-Global

The Crop Trust collaborated with the US Department of Agriculture (USDA) and Bioversity International to develop and deploy an advanced genebank data management software package, GRIN-Global, which was initially released at the end of 2011. GRIN-Global is currently used by 12 genebanks globally, 4 in the CGIAR and, 8 in national programs. Twenty-eight other genebanks, including 4 from the CGIAR, are evaluating, or are in the process of implementing, GRIN-Global as their primary genebank management system. A GRIN-Global helpdesk service offers support to national and international genebanks, who wish to explore the possibility of adopting GRIN-Global.

#### Genesys

In furtherance of Article 17.1 of the Treaty and Priority Activity 15 of the Second Global Plan of Action, CGIAR and the Crop Trust are continuing to support through the Genebanks Platform the development of Genesys as a fundamental component of an effective global conservation system. Genesys has been managed by the Crop Trust since 2014, with the Treaty Secretariat participating in the advisory committee since the beginning. Genesys now allows searching passport data across some 4 million active accessions held in 463 collections. The Crop Trust works continuously with existing data providers to help them share up-to-date information about their collections and actively promotes and encourages data publication (automated when feasible) from new genebanks.

Since 2017, new agreements to publish data on Genesys have been established with the following institutes: CATIE, GeRRI (KALRO, Kenya), MARDI (Malaysia), NPGRL (Philippines), NGBT (Tunisia), NCARE (Jordan), NACGRAB (Nigeria), APGRC (Sudan), ICBA (UAE).

Since 2018, Genesys automatically informs GLIS about any updates to passport data for material with a DOI.

#### Genesys Catalog

Access to characterization and evaluation data is an important contributing factor to the increased and more effective and efficient use of germplasm collections. The German Federal Office for Agriculture and Food (BLE) funded the Genesys Catalog project, between September 2016 and October 2018. This focused on providing new, well-documented and accessible datasets of phenotypic (characterization and evaluation) information in Genesys to complement existing passport data. The project also allowed for the development of sections within Genesys where data publishers can maintain crop descriptors and prepare and publish characterization and evaluation datasets; and users can discover characterization and evaluation datasets, accessions with characterization and evaluation data, and crop descriptor lists. A browsing interface developed under the project is available.<sup>13</sup>

The following partners participated in this project: Tropical Agricultural Research and Higher Education Center (CATIE; Costa Rica), the World Vegetable Center (WorldVeg), the Genetic Resources Research Institute (GeRRI; Kenya), the Malaysian Agricultural Research and Development Institute (MARDI), the National Plant Genetic Resources Laboratory (NPGRL; Philippines) and the National Genebank of Tunisia (NGBT). By the end of the project, they had uploaded to the Genesys

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<sup>13</sup> <https://beta.genesys-pgr.org/datasets?s=id>

Catalog 79 characterization and evaluation datasets, 1,877 crop trait descriptors and 8,458 accessions with characterization and evaluation data. Project partners have contributed 66,652 new passport data records to Genesys. The Genesys team also advocated for adoption of DOIs for genebank material. CATIE and MARDI have accordingly registered their material in GLIS and obtained DOIs. In 2019, we engaged the CGIAR genebanks for contributions to the Genesys Catalog.

#### IT assessments and upgrading

The Crop Trust has assisted genebanks with the analysis of their documentation needs, and, if they so wish, with the adoption of GRIN-Global and with making information on their collections available through Genesys. To that end, genebank documentation experts visited 35 national and regional genebanks between 2014 and early 2019.<sup>14</sup> Based on the results of these assessments, support to strengthen capacity for data management was provided to the national and regional genebanks in 23 countries.<sup>15</sup>

### D. RESOURCE MOBILIZATION

The Crop Trust mission is “a cost-effective, rational, and global system for ex situ conservation of crop diversity supported by long-term, sustainable funding”. Hence, the Crop Trust’s fundraising priority continues to be the growth of the endowment fund, able to provide predictable and reliable long-term funding to key, globally important, national and international genebanks. Based on costing studies initiated by the Crop Trust, our target is to provide USD 34 million a year to fund national and international genebanks, as well as the running costs of the Svalbard Global Seed Vault and the Crop Trust Secretariat. Availability of USD 34 million annually requires an endowment fund of USD 850 million (based on 4% average annualized rate of return plus US inflation).

Since its inception in 2004 up to the 31 December 2018, the Crop Trust received USD 273.8 million in donor contributions paid into the endowment, including a EUR 50 million concessional loan from KfW (German Development Bank) in October 2017. In addition, the Crop Trust received a total of USD 216 million in project funding and USD 21 million for operating expenses.

The Crop Trust’s fundraising efforts are overseen by both its Executive Board and the Donors Council. The Donors Council is comprised of governments and private sector donors who contribute at least USD 25,000 or USD 250,000, respectively. The Donors Council meets biannually and provides financial oversight and advice to the Executive Board.

During the biennium, the Crop Trust has collaborated with the Treaty Secretariat in this area by taking active part in the Ad Hoc Committee on the Funding Strategy and Resource Mobilization, and by working together on proposals for updating global crop conservation strategies and developing a cost of inaction study (with IFPRI, with additional funding from the Food Forever Initiative).

#### A more diversified fundraising strategy

As previously reported, in order for the endowment fund to reach its goal of USD 850 million, the Crop Trust needs a diversified fundraising strategy. The Executive Board meeting in October 2017 endorsed the Crop Trust’s efforts to diversify its donor base, noting that the primary focus will remain on grants from governments to build the endowment fund, while recognizing that a rapidly changing funding environment requires innovation.

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<sup>14</sup> Azerbaijan, Bhutan, Bolivia, CATIE, Chile, Colombia, Cuba, Cyprus, Ecuador, Egypt, Ethiopia, Guatemala, Jordan, Kenya, Lebanon, Malaysia, Mexico, Morocco, Myanmar, Nepal, Nigeria, Oman, Peru, Philippines, Russia, Rwanda, SPC, SPGRG, Sri Lanka, Sudan, Tunisia, Turkey, Uganda, Uruguay, Vietnam, Zambia

<sup>15</sup> Azerbaijan, Bolivia, CATIE, Chile, Colombia, Cuba, Ecuador, Guatemala, Jordan, Kenya, Lebanon, Morocco, Nigeria, Peru, Philippines, Rwanda, SPC, SPGRG, Sudan, Tunisia, Uganda, Uruguay, Vietnam

We hold annual bilateral discussions with major current donors to review their budgetary priorities, while efforts to recruit new governments as donors continue. In addition to endowment fund giving, the Crop Trust continues to pursue time-bound funding from specific donors to cover the basic operating expenditures of individual genebanks, or for specific projects for the upgrading of collections, prioritizing collections and crops that are included under Article 15 and Annex 1 of the Treaty, as well as those identified relevant crop strategies.

As the Crop Trust builds the endowment fund it is crucial to limit avoidable withdrawals. To this end we continue to seek time-limited support for the basic operating expenditures of genebanks, the Crop Trust Secretariat and the Svalbard Global Seed Vault. In 2018, the Secretariat was able to secure support from number of donors towards its commitment to the CGIAR Genebank Platform.

In addition the Crop Trust continues to move forward with its exploration of innovative financing mechanisms. At its meeting on 14-15 June 2018 in Bonn, Germany, the Donors Council agreed to establish a Working Group on Innovative Finance (IFWG) The IFWG is chaired by Mr. Stefan Schmitz, Head of Division Rural Development and Food Security (Germany, BMZ). The IFWG met on three separate occasions: 9 October 2018, 6 December 2018 and 7 March 2019.

The IFWG circulated a report to the Spring 2019 Donors Council and Executive Board meetings that provided a comprehensive review identifying possible solutions that could be pursued by the Crop Trust, with the support of its Executive Board, Donors Council and other potential donors. The mechanisms were classified as: (1) current/ongoing (investment sharing facility); (2) approval required by Executive Board to explore further (member country loans; crop based fundraising; crowd sourcing) and (3) requires further study (food security bond; debt-for-nature swaps). The Executive Board agreed that the Crop Trust will now work to further investigate member country loans, crop-based fundraising and crowd sourcing mechanisms. The Executive Board also agreed that the IFWG continue its work.

Engaging the private sector is crucial to achieving our fundraising targets. As discussed in the report to the 7<sup>th</sup> Session of the Governing Body, the Crop Trust is pursuing crop-based fundraising to foster greater engagement and investment from private sector actors. The aim of crop-based fundraising is to tie conservationists, researchers, producers, consumers and others in the commodity chain of food crops into the development and implementation of a global conservation strategy for a given crop. We are testing this approach with the Global Coffee Conservation Strategy, produced jointly with World Coffee Research.

## **E. COMMUNICATION & OUTREACH**

The Crop Trust's communication and outreach efforts focus on two overarching goals:

1. raising awareness of the important role crop diversity plays for our food, now and in the future; and
2. highlighting the technical work that our partners are doing to make sure that crop diversity is indeed conserved and available.

These messages have received major media attention over the past biennium and introduced new champions for the cause, highlighting that, perhaps more than ever, people are recognizing the value and urgency of conserving agrobiodiversity, and are speaking up.

To better address a growing audience, the Crop Trust continues to expand its online presence. We have redesigned and enhanced our homepage in early 2018 and on the occasion of the Svalbard Global

Seed Vault's 10th anniversary, and we also developed an online page<sup>16</sup> to highlight the Seed Vault's success over the past decade.

Phase II of the CropsInColor campaign, an expanded audiovisual storytelling effort that explores and celebrates the role 10 crops play in the lives of people in 14 countries across the world, was officially launched in September 2018. Since then, we have explored the role that squash and pumpkins play in the Northeast of the USA, and coffee in Central America. Following each trip, we publish a series of communications materials.<sup>17 18 19 20 21</sup>

The Crop Trust continues to publish interactive annual reports both online and in hard copy. In late 2018, and in early 2019, however, a major effort was undertaken to make our work more digestible by developing a printed magazine. This fills a specific communications gap by having a longer shelf-life than the annual report, and hopefully being much more engaging, which promises a wider readership.

The Svalbard Global Seed Vault also continues to be a popular news focus, with extensive coverage of the 5 deposits that occurred in the last 18 months. Overall, the Crop Trust's social media presence continues to grow as well: with almost 10,000 followers currently on Twitter and Facebook, and 7,000 on Instagram and LinkedIn. We also have YouTube and Vimeo channels.

### Food Forever

The Food Forever Initiative (FFI)<sup>22</sup> is an awareness raising campaign focused on engaging the global community on the importance of achieving Sustainable Development Goals' Target 2.5, which states that by the year 2020 all of agricultural biodiversity should be safeguarded and made accessible for its sustainable use. Food Forever attempts to "influence the influencers" by creating communication efforts that help better understand the critical importance of crop and livestock diversity to build more sustainable food systems, face climate change and end hunger.

The initiative is coordinated through a Secretariat made up of the Crop Trust, FAO and the Government of the Kingdom of the Netherlands. The Secretariat reports directly to four separate bodies: (i) the Chair of the Food Forever Initiative, (ii) the Board of Overseers, (iii) the Donor Countries (currently Germany, Netherlands, Norway and Switzerland), and (iv) the Champions and Partner Organizations. The Secretariat is currently hosted by the Crop Trust at its offices in Bonn. Functions of the Secretariat include ensuring fluent coordination and communication with Champions and Partners; drafting the work plan and other strategy documents, organizing the awareness-raising activities and coordination meetings; coordinating the outreach strategy (digital and written media pieces, web improvement; PR campaigns, etc.); managing the initiative's budget; and reporting to donors.

FFI continues to gain momentum, with 34 "champions" coming on board since its launch in June 2017. A comprehensive interactive website has been developed, an editorial calendar planned and executed with a series of opinion articles and multimedia pieces, and several high level events organized.

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<sup>16</sup> <https://spark.adobe.com/page/sQwEmIFwpVxyW/>

<sup>17</sup> <https://vimeo.com/301603982>

<sup>18</sup> <https://www.croptrust.org/blog/cropsincolor-squash/>

<sup>19</sup> <https://www.flickr.com/photos/croptrust/sets/72157702280580261>

<sup>20</sup> <https://www.croptrust.org/spotlight/chef-dan-barber/>

<sup>21</sup> <https://stories.croptrust.org/story/cup-o-joe/>

<sup>22</sup> <https://www.food4ever.org>

One of the first major events took place in November 2017, when FFI organized a Food Biodiversity for Greater Climate Resilience side event at Crop Trust HQ, in parallel with the UNFCCC COP23 climate change meeting in Bonn. FFI's next undertaking was in London, in January 2018. Attendees of a Crop Trust luncheon with HRH, the Prince of Wales were afterwards invited to the event Getting Together for the Future of Food, at the UK headquarters of Deutsche Asset Management, London. Participants discussed the challenges facing our food system and the role crop diversity, and biodiversity more broadly, can play in a more sustainable, resilient, healthy future. In May 2018, Food Forever Champion and eventual Chair, HE Mercedes Araoz, the Vice President of Peru, hosted a high-level dinner in Cusco, Peru during the 10th World Potato Congress. The dinner gathered stakeholders from the food and agricultural sectors of Peru and internationally to discuss the importance of safeguarding and using biodiversity within potatoes, including the more than 3,500 varieties grown in the country, most of which have limited to no access in the market. In September 2018, FFI had the first session of its Board of Overseers. In September of 2018, the first annual Champion's meeting was held in Delaware, USA, bringing together many FFI Champions and Partner Organizations to discuss specific activities which then formed the basis for the 2019 Strategic Work Plan for the initiative.

FFI is also implementing a series of 4 awareness raising campaigns, as below.

1. FFI organized its first Food Forever Experience in New York City during the UN Global Day of Action in September 2018. The Experience, which was co-hosted with Google, The Lexicon of Sustainability and Tender Greens took place at the Google Offices in Manhattan and challenged 10 renowned chefs to cook with diverse ingredients that could soon break through as the next foods of the future. The event was attended by more than 150 influential guests from the public and private sectors, as well as civil society, and was widely covered by local and international media, including a 6-minute piece by CBS in its Monday morning program. Since then, FFI has hosted 5 additional Food Forever Experiences: (1) in February 2019 in San Jose, Costa Rica in conjunction with the 10-Year Framework for Programs on Sustainable Food Systems (10YFP-SFS) conference; (2) in Bonn, Germany during the SDG Global Festival of Action in May 2019; (3) in Cusco, Peru around the UN Day of Biological Diversity attended by more than 150 influential guests, including the President of Peru, who became the first head of state to sign the Food Forever Declaration of Interdependence. (4) in Stockholm, Sweden during the EAT Food Forum in June 2019; and (5) in Chicago in July 2019 once again the result of a partnership with Google and others.
2. The "2020 for 2020" campaign is the result of a partnership with the Chef's Manifesto. The goal is to enlist 2020 chefs before the year 2020 to advocate for biodiversity. The campaign was officially launched during the presentation of the Knorr/WWF's Future 50 Foods report, and has to date engaged more than 250 chefs.
3. FFI launched its third campaign in March 2019, during the One Planet Summit in Nairobi, Kenya, the result of a partnership with the Food Systems Dialogues (FSDs). The main of the Food Forever Dialogues is to gather local stakeholders to discuss the main challenges that their food systems are facing, but, in this case, also explore the potential that biodiversity has to become part of the solution. Future Dialogues will be held in other parts of Africa and the developing world in 2019 and 2020, and will serve to feed a summary report which will be presented during the UN General Assembly in 2020.
4. The Traveling Exhibit on Crop Diversity for Botanic Gardens is an informational campaign aiming to highlight the importance of crops for food security, farmers' livelihoods and ecosystem services by facilitating exhibitions in botanic gardens which can be easily set up at a low cost.

*Appendix A*

Overview of pre-breeding projects

Completed projects are highlighted in italics.

Crop	Countries and/or partners	Focus traits	Project period
<i>Alfalfa</i>	<i>Australia, Chile, China, Kazakhstan</i>	<i>Drought tolerance</i>	<i>2015–2018</i>
Banana	Belgium (KU Leuven, Meise), Bioversity, IITA (Nigeria), Papua New Guinea	Drought tolerance	2016–2020
Barley	ICARDA, Germany, Morocco	Drought, heat and salinity tolerance, enhanced nutritional value, disease and pest resistance	2016–2019
Bean	Colombia, CIAT, Honduras	Heat, drought, waterlogging and root rot resistance	2016–2019
<i>Carrot</i>	<i>Bangladesh, Pakistan, USA</i>	<i>Heat, salt and drought tolerance</i>	<i>2014–2018</i>
Chickpea	ICARDA, Turkey, USA	Drought tolerance	2014–2019
Cowpea	IITA, Burkina Faso, Niger, Nigeria	Drought, heat	2016–2019
<i>Eggplant</i>	<i>Côte d'Ivoire, Spain, Sri Lanka</i>	<i>Drought resistance, waterlogging, cold and heat tolerance, root system development</i>	<i>2013–2016</i>
<i>Finger millet</i>	<i>ICRISAT (Kenya), Kenya</i>	<i>Drought tolerance, resistance to blast and Striga, agronomic traits</i>	<i>2015–2018</i>
Grasspea	ICARDA, Morocco, India	Heat tolerance, low toxicity, broomrape (Orobanche), powdery mildew and aphid resistance	2016–2019
<i>Lentil</i>	<i>Bangladesh, Canada, ICARDA (Morocco), Nepal, Spain, Turkey</i>	<i>Drought tolerance, Orobanche and Stemphyllium blight resistance</i>	<i>2013–2017</i>

Pearl millet	ICRISAT (India), India, ICRISAT (Niger)	Heat and terminal drought tolerance	2015–2019
Pigeonpea	ICRISAT (India), India	Salinity tolerance, Phytophthora blight and pod borer resistance, yield-related traits	2015–2019
<i>Potato</i>	<i>Brazil, CIP (Peru), Peru, Uruguay</i>	<i>Heat and drought tolerance, late blight and bacterial wilt resistance</i>	<i>2013–2017</i>
<i>Rice</i>	<i>IRRI (The Philippines), USA</i>	<i>Yield-related traits under drought</i>	<i>2011–2016</i>
Sorghum	Australia, Ethiopia	Heat tolerance, cool soil conditions tolerance, water-use efficiency, rust, anthracnose, grain mold and downy mildew resistance	2015–2019
<i>Sunflower</i>	<i>Canada, Uganda</i>	<i>Drought tolerance, early flowering, yield-related traits</i>	<i>2011–2016</i>
Sweetpotato	CIP (Peru), USA, Mozambique	Heat tolerance	2014–2019
Wheat (durum)	India, CIMMYT (Mexico), ICARDA (Morocco), UK	Yield potential, heat tolerance, drought tolerance, disease resistance	2014–2019

*Appendix B*

## Overview of pre-breeding evaluation projects

Projects with a strong component on farmer participatory engagement in breeding are indicated by an asterisk. Lead partners are indicated in bold.

Crop	Partners	Title/Focus traits	Project period
Sunflower	<b>University of British Columbia</b> , Canada; National Semi-Arid Resources Research Institute (NaSARRI), Uganda; Indian Institute of Oilseeds Research (IIOR), India; Instituto Nacional de Tecnología Agropecuaria (INTA), Argentina; Galilee Research Institute (MIGAL), Israel; North Central Regional Plant Introduction Station (NCRPIS), USA; SOLTIS, Euralis Semences, France	Evaluation of Sunflower Pre-Bred Lines for Stress Resistance and Associated Trade-Offs with Yield  Drought and heat tolerance, yield-related traits, biotic stresses	04/2017–06/2020
Eggplant	<b>World Vegetable Center</b> ; Université Félix Houphouët-Boigny, Côte d'Ivoire; Universitat Politècnica de València, COMAV, Spain; Dept. of Crop Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka  Breeding companies (in kind): East-West Seed, Philippines; Meridiem Seeds, Spain; Callivoire, Côte d'Ivoire; Hayleys Agriculture Holdings Limited, Sri Lanka; Novagenetic, France	Development and Preparation of Eggplant Pre-Bred Materials for Adaptation to Climate Change  Drought resistance, biotic stresses	07/2017–12/2019
Sorghum (Kenya)*	<b>Rongo University</b> , Kenya; Ugenya Banana Farmer group; Aminyasa Youth Group	Sorghum Breeding with Wild Relatives: Evaluating Pre-breeding Material with Farmers in Kenya  Key adaptive and agronomic traits	03/2018–09/2020

Sorghum (Mali)*	<b>Institut D'Economie Rurale (IER-SRA Cinzana)</b> , Mali; Union des Agriculteurs du Cercle de Tominian (UACT); ICRISAT	Sorghum Breeding with Wild Relatives: Evaluating Pre-breeding Material with farmers in Mali  Key adaptive and agronomic traits	03/2018–09/2020
Rice (Vietnam)*	<b>Can Tho University</b> , Vietnam; Mekong Delta Development Research Institute (MDI) of CTU; College of Agriculture and Applied Ecology; 2 seed centers; 1 seed cooperative; 1 seed station; 9 seed clubs	Adapting Agriculture to Climate Change: Participatory Evaluation of Crop Wild Relative Introgressed Genetic Resources in Rice in the Mekong Delta, Vietnam  Key adaptive and agronomic traits	05/2018–10/2020
Potato*	<b>International Potato Center (CIP)</b> , Peru; CIP, Kenya; Yanapai NGO, Peru; EMBRAPA, Brazil; KEPHIS, Kenya; KALRO-Tigoni, Kenya	Crop Wild Relatives (CWR)-Derived Potatoes for Climate Change Resilience of Farming Communities in Kenya and Peru  e.g. combining late blight resistance and drought tolerance from CWR with advanced heat-tolerant breeding lines	05/2018–09/2020
Durum wheat*, barley*, lentil*	<b>International Center for Agricultural Research in the Dry Areas (ICARDA)</b> ; INRA-MAR, Morocco; Institut Sénégalais de Recherches Agricoles (ISRA), Senegal; Ethiopian Institute of Agricultural Research (IAR), Ethiopia; Lebanese Agricultural Research Institute (LARI), Lebanon	DIIVA-PR:  Dissemination of Interspecific ICARDA Varieties and Elites through Participatory Research  Key adaptive and agronomic traits	06/2018–10/2020

Pigeonpea*	<p><b>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</b>, India; PJTSAU-RARS Warangal, India; ANGRAU-RARS, Tirupati, India; UAS-ARS, Gulbarga, India; Department of Agricultural Research (DAR), Yezin, Myanmar</p>	<p>Utilization of introgression lines derived from wild <i>Cajanus</i> species for pigeonpea (<i>Cajanus cajan</i>) improvement</p> <p>Key adaptive and agronomic farmer-preferred traits</p>	07/2018–09/2020
Finger millet*	<p><b>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</b>, Kenya; Maseno University, Kenya; KALRO-Kisii, Kenya</p>	<p>Improving Finger Millet Productivity through Exploitation of Wild Germplasm (<i>Eleusine</i> spp.)</p> <p>Key adaptive and agronomic farmer-preferred traits</p>	09/2018–11/2020
Carrot*	<p><b>USDA-ARS</b>, USA; University of Sargodha, Pakistan; Bangladesh Agricultural University, Bangladesh; Bangladesh Agricultural Research Institute, BARI, Bangladesh; Bangladesh Institute of Nuclear Agriculture, BINA, Bangladesh; World Vegetable Center</p>	<p>Carrot germplasm development and farmer training for production in stressful environments</p> <p>Key adaptive and agronomic farmer-preferred traits</p>	10/2018–09/2020
Alfalfa*	<p><b>South Australian Research and Development Institute (SARDI)</b>, Australia; Instituto de Investigaciones Agropecuarias (INIA), Chile; Kazakhstan Research Institute for Agriculture and Plant Growing (KSRIAPG), Kazakhstan; Grasslands Research Institute of the Chinese Academy of Agricultural Sciences (GRI), China; University of California Davis, USA; University of Wisconsin, USA</p>	<p>The use of crop wild relatives to develop drought tolerant alfalfa and its extension to subsistence farmers in Kazakhstan, China and Chile</p> <p>Key adaptive and agronomic farmer-preferred traits</p>	01/2019–11/2020

Common bean	<b>International Center for Tropical Agriculture (CIAT)</b> , Columbia; Instituto de Investigação Agraria de Moçambique (IIAM), Mozambique; Escuela Agricola Panamerica Zamorano, Honduras; AgroSavia, Colombia	Using Bean Populations Derived from P. acutifolius to Advance Toward Generation of New Bean Varieties and Discerning the Traits and Genetic Base Associated to Heat Tolerance  Key adaptive and agronomic farmer-preferred traits	01/2019–10/2020
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