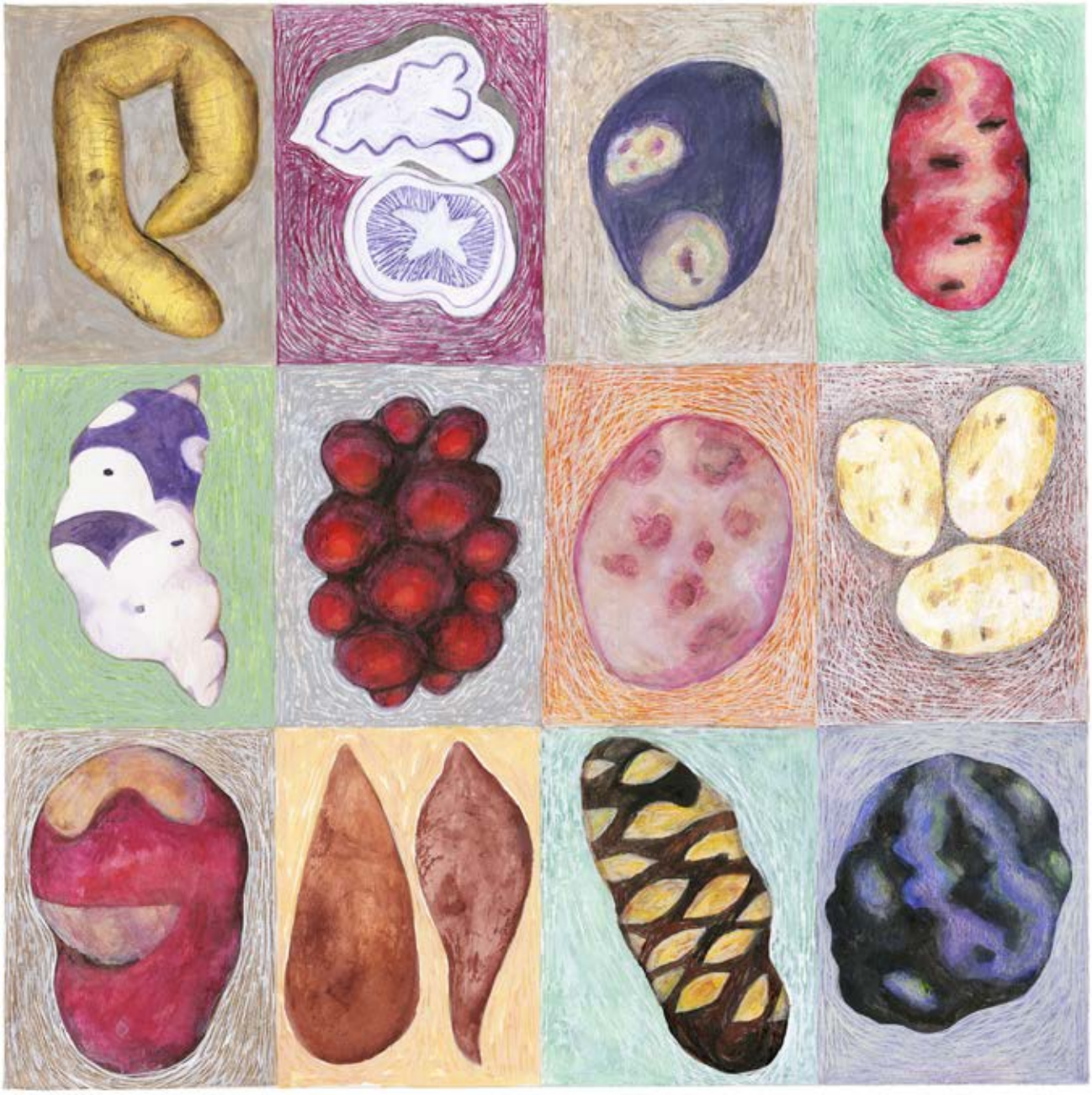
THE CROP TRUST
ANNUAL REPORT 2020



CROP TRUST
SECURING OUR FOOD, FOREVER

CONTENTS

LEFT The Crop Trust's staff are as diverse as the crops we work to safeguard. DAGNY POSER/CROP TRUST.

LETTER FROM THE EXECUTIVE DIRECTOR STEFAN SCHMITZ

No aspect of the Crop Trust's work in 2020 was left untouched by the upheaval caused by the COVID-19 pandemic.

The shocks of the past year have emphasized just how interconnected, interdependent and complex our world is—and how vulnerable we and our global systems are.

But, at the same time, the pandemic has revealed much that is good about humanity: our adaptability, resilience, perseverance and readiness to support each other.

I am proud to say that I observed all of these traits at the Crop Trust during my first year as Executive Director.

When I review our achievements, as laid out in this annual report, I consider myself fortunate—fortunate to be part of a robust organization that is built on a solid foundation, staffed with such dedicated colleagues, connected to skilled networks and committed to a critical mission.

Owing to the pandemic, genebank managers and staff around the world had to find new ways to work to avert the risk of losing the precious plant genetic resources in their care, and planned expeditions to collect plants in the field had to be postponed.

But, thanks to their dedication and perseverance, essential conservation work not only continued, but also grew.

Our core support to the Svalbard Global Seed Vault remained steadfast, and, before world travel shut down, we celebrated the largest deposit since the Vault was opened in 2008. We continued to support the international genebanks under the CGIAR Genebank Platform, and also expanded our expert, evidence-based crop strategies to guide further conservation and use of crop diversity.

The ongoing innovations of Genesys and other information systems, the successes of the long-term Crop Wild Relatives Project and Templeton World Charity Foundation Pre-Breeding Project, as well as the progress of our newest project, Seeds for Resilience, also give us much to celebrate.

We are pleased to have signed a memorandum of understanding with the International Center for Biosaline Agriculture to contribute to food security efforts in some of the world's most arid and saline environments. We also joined the Global Landscapes Forum as its 29th Charter Member, opening up new partnership opportunities and giving us greater access to key global communities.

A clear message emerges from this report: the Crop Trust is in a strong and unique position to support and advance global efforts to safeguard crop diversity, essential for future food and nutrition security.

Our next step is to leverage our assets to broaden the scope of our work and to scale-up our impact, including by extending our support to a wider range of genebanks, crops, technological initiatives and capacity-building programs through new projects

The pandemic has demonstrated that nothing is certain. But, in turn, we have proven that it is possible to mitigate that uncertainty by being focused, creative and adaptable, and ready to find solutions to the challenges of our ever-changing world.

STEFAN SCHMITZ
EXECUTIVE DIRECTOR

"The collaboration between the Crop Trust and the Plant Treaty has been vital to saving and promoting the sustainable use of plant genetic resources. The importance of this partnership has become even more crucial, as well as evident, during this unprecedented COVID-19 global pandemic that has devastated lives, livelihoods and food security."

KENT NNADOZIE SECRETARY OF THE PLANT TREATY AND PLANT TREATY REPRESENTATIVE TO THE EXECUTIVE BOARD OF THE CROP TRUST

MAIN Guanaco (closely related to llama) are a nuisance to farmers in Chile; here they graze in an alfalfa pasture intended for livestock. LUIS SALAZAR/CROP TRUST.

ABOVE Stefan Schmitz. CHRISTOPH MEINSCHÄFER.

2020 **KEY FIGURES**

1 DIVERSITY SUPPORTED:

USD 30.9 million in grants provided to fund conservation

The Crop Trust, with the help of its partners, conducted a wide variety of program activities in 2020 geared towards crop conservation in support of its core mission. Projects supported include the Genebank Platform, the Crop Wild Relatives Project, the development of crop-based strategies, among others.

2 CONTRIBUTIONS TO FUTURE DIVERSITY:

USD 17.9 million contributed to the Crop Diversity Endowment Fund.

The market value of the Endowment Fund reached USD 365.5 million by the end of 2020 (USD 312.8 million in 2019) as a result of these new contributions and a net investment return in 2020 of 13.6%.

3 DIVERSITY SAFETY DUPLICATED:

82,501 seed samples added to the Svalbard Global Seed Vault

As of 2020, the Svalbard Global Seed Vault safeguards 1,074,533 seed samples from genebanks and research institutions worldwide.

4 DIVERSITY RECORDED:

3,366,048 records of genebank samples updated in Genesys

As of 2020, Genesys makes information available on 4,105,227 records of genebank seed samples.

5 DIVERSITY DATA GENERATED:

13 new crop-specific databases added

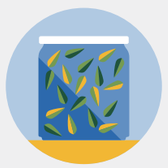
Data from pre-breeding and evaluation efforts are being shared by the James Hutton Institute, UK, based on work carried out under the Crop Wild Relatives Project.

MAIN Seed samples in Vietnam. BRENT STIRTON OF GETTY IMAGES FOR THE CROP TRUST.

6 DIVERSITY SHARED:

78 countries received 43,530 crop diversity samples from genebanks in the CGIAR Genebank Platform

The 11 CGIAR genebanks supported by the Genebank Platform have distributed nearly 900,000 samples to more than 160 countries since 2012 when the Crop Trust started coordinating the program.



7 DIVERSITY CONSERVED:

736,210 crop diversity samples are managed by genebanks in the CGIAR Genebank Platform

Performance targets introduced by the Crop Trust have encouraged CGIAR genebanks to increase the proportion of their collections that are acceptably viable, disease-free, and available for immediate distribution. As of 2020, 82% of the total number of samples are available, up from 66% in 2012.

A DECADE OF
WILD GENETIC DIVERSITY

AT A GLANCE

The Crop Wild Relatives (CWR) Project supported the collection of important species of CWR to ensure their long-term conservation, and is currently facilitating the use of their genetic diversity in breeding new, improved crops. The project was launched in 2011, and is due to end in 2021.

PROJECT TITLE: Adapting Agriculture to Climate Change: Collecting, Protecting and Preparing Crop Wild Relatives

FUNDING PARTNER: Government of Norway

PARTNERS: More than 100 specialist research institutes and national and international conservation and breeding programs in 50 countries around the world

Scan to watch a video tutorial for the new eggplant Germinate database

Into the final phase

Though COVID-19-related disruptions necessitated an extension, the project continued toward its goals. With the collecting phase already complete, work on pre-breeding and evaluation also started to wind up in 2020.

Tough times, tougher crops

As of 2020, 16 pre-breeding projects and 5 evaluation projects have been completed. All promising plant material is being made internationally available under the terms of the International Treaty on Plant Genetic Resources for Food and Agriculture (the Plant Treaty).

Some of the initial research findings and achievements from the pre-breeding and evaluation phase of the CWR Project were gathered into a Special Issue of the journal *Crop Science*, "Adapting agriculture to climate change: A walk on the wild side," published in early 2021.

Data for all

It is essential that the invaluable data generated by the pre-breeding and evaluation projects are widely accessible. The James Hutton Institute is developing Germinate databases containing pre-breeding data for the 13 crops under the CWR Project that did not already have appropriate existing databases. By making these data easily and publicly available, germplasm developed through pre-breeding projects will be able to reach research and breeding programs worldwide.[1]

1 See Raubach, S, Kilian, B, Dreher, K, et al. From bits to bites: Advancement of the Germinate platform to support genetic resources collections and prebreeding informatics for crop wild relatives in Crop Science (https://doi.org/10.1002/csc2.20248)

FACING PAGE Farmers in Chile planted CWR-derived alfalfa from the Institute of Agricultural Research (INIA). LUIS SALAZAR/CROP TRUST.

"We're already seeing the CWR Project's benefits for smallholder and subsistence farmers. In China, Kazakhstan and Chile, for example, fields are flourishing with drought-tolerant varieties of alfalfa."

BENJAMIN KILIAN CROP WILD RELATIVES PROJECT LEAD AND SENIOR SCIENTIST PLANT GENETIC RESOURCES

COVID-19 EFFECT

A no-cost extension to December 2021 was granted to the project as a whole owing to significant work interruptions occasioned by the pandemic. Three pre-breeding and eight evaluation partnerships were granted no-cost extensions through mid-2021.

To maintain critical activities in 2020 under COVID-19 restrictions and lockdowns, breeders, researchers, farmers and others were forced to take extraordinary measures–with some leaving family to stay on-site at their workplaces, ensuring that vulnerable plant materials and ongoing experiments would be looked after. It is because of these individual and collective sacrifices that project activities were able to continue at all in 2020.

DELIVERING **CWR-DERIVED VARIETIES** INTO FARMERS' HANDS

ABOVE **Barley growing in the Atlas Mountains in Morocco under the DIIVA project, led by ICARDA.**
MICHAEL MAJOR/CROP TRUST.

DIIVA

DIIVA* is the largest pre-breeding and evaluation project under the CWR Project umbrella, covering three crops (barley, durum wheat and lentil) and spanning multiple countries.

Despite the challenges of both COVID-19 restrictions and extreme drought, farmers and researchers in Morocco managed to carry out 19 on-farm trials for all three crops in 2020.

In the on-farm trials, each farmer grew the most promising new CWR-derived lines alongside their standard market varieties under the same conditions for comparison, using their own individual farming practices.

Excellent feedback was received by farmers, with yield increases of 10% to 80% across different environments. Farmers greatly appreciated the new CWR-derived seeds, pointing to the greater yields and improved drought tolerance over local varieties. Local women were also surveyed and liked the cooking quality of the tested lines.

Based on farmers' positive feedback, two new CWR-derived lines of durum wheat, Zagharin 2 and Jabal, were promoted to a second year of national variety testing in Morocco. Zagharin 2 was officially released in Lebanon for farmers' use in 2020.

**Dissemination of Interspecific ICARDA Varieties and Elites through Participatory Research (DIIVA)*

ALFALFA

Alfalfa is one of the most important crops for feeding livestock worldwide. The CWR alfalfa partnership has introduced improved CWR-derived alfalfa seeds to smallholder and subsistence farmers in Chile, China and Kazakhstan.

Developing cold-hardy forage plants is especially important for farmers in regions like Inner Mongolia, China, where temperatures regularly drop below -30 degrees C, making it difficult for plants to survive.

The Grasslands Research Institute in Hohhot, China recently released the CWR-derived Zhongcao No.3, a variety superior in cold tolerance to existing ones in Inner Mongolia. The CWR Project has supported the distribution of Zhongcao No.3 by multiplying seeds on a large scale.

This seed-sharing scheme for Zhongcao No.3, supported by the CWR Project, has led over 1500 new farmers to grow the variety to feed their sheep; the first successful commercialization of a CWR-derived alfalfa in the region.

In Kazakhstan, an experiment to test honeybee pollination of alfalfa has been hugely successful, with average increases in seed production of 80% near the hives. The National Academy of Sciences of the Republic of Kazakhstan is now supporting farmers to integrate commercial honeybees into domestic alfalfa seed production–a win for farmers, livestock, alfalfa and the bees!

SUNFLOWER

The sunflower pre-breeding partnership has developed seeds for breeding new sunflower varieties that can thrive under a variety of tough conditions: heat, drought, diseases and other stresses.

New sunflower pre-breeding lines were tested in field trials in Argentina, Uganda, India, and France. Many of the new seeds performed better than existing, stress-tolerant varieties, and are now making their way into sunflower breeding programs across the globe.

They are now in the hands of collaborators (IIOR, INTA, NaSARRI, SOLTIS), who will use the materials to breed new sunflower varieties that are adapted to local needs and conditions.

The pre-bred seeds are also freely available through the USDA's genebank network.

The project also made great advances for future sunflower breeding by using molecular markers to identify the regions of the new pre-breeding lines' genomes that contain genes introduced from CWRs.

ABOVE **Alfalfa and sunflower.**
LUIS SALAZAR/CROP TRUST.

AT THE CUTTING EDGE OF **PRE-BREEDING**

AT A GLANCE

Building on the work of the CWR Project, the Pre-Breeding Project supported by the Templeton World Charity Foundation connects breeders with the genetic diversity they need to continue improving grasspea and finger millet. In doing so, the project contributes to food security and health, while also protecting the environment and providing income for smallholder farmers.

FULL PROJECT TITLE: Safeguarding Crop Diversity for Food Security: Pre-breeding Complemented with Innovative Finance

FUNDING PARTNER: Templeton World Charity Foundation Inc.

IMPLEMENTING PARTNERS:

- Ethiopian Institute of Agricultural Research (EIAR)
- International Center for Agricultural Research in the Dry Areas (ICARDA)
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- James Hutton Institute, UK
- John Innes Centre, UK
- Kenya Agricultural and Livestock Research Organization (KALRO)
- National Semi-Arid Resources Research Institute, Uganda (NaSARRI)
- Tanzania Agricultural Research Institute (TARI)

FACING PAGE **Grasspea at ICARDA's facilities at Marchouch Station, Morocco.** MICHAEL MAJOR/CROP TRUST.

Grasspea gets growing

Grasspea is an important crop for global food security: it can be eaten as a grain, fed to livestock and used as fertilizer for farming systems. It can withstand the environmental extremes that cause other crops to fail—such as droughts and floods—and it's rich in iron, zinc and protein.

The Pre-Breeding Project has been working to advance grasspea pre-breeding through the application of state-of-the art tools and techniques.

Using traditional methods, it can take 12 years to breed a new grasspea variety using wild relatives as parents. With a 'speed breeding' technique developed by the United States National Aeronautics and Space Administration (NASA), this can happen in as little as 5 years. Scientists at ICARDA in Rabat, Morocco have been using speed breeding to develop new varieties of grasspea for farmers in South Asia and East Africa.

High-tech breeding of new varieties is only possible, however, with carefully developed source materials and robust genetic information. In the past year, project partners have also greatly advanced what is known about the grasspea genome by re-sequencing and re-assembling the entire reference genome—a boon for all future grasspea breeding efforts.

Finessing finger millet

Finger millet is another highly nutritious, drought-tolerant crop that is important for smallholder farmers, particularly women. However, yields are stagnating, in part because of blast disease and a parasitic plant called *Striga*.

The Pre-Breeding Project is fighting back by delivering a pre-breeding scheme for East Africa designed to develop seeds that are more tolerant to disease and other stresses. Under the project, scientists and breeders have already produced 91 crosses between promising donor landraces and farmer-preferred varieties in Ethiopia.

Molecular characterization is also underway for the largest and most important Eastern African finger millet collections, which will provide a foundation for future breeding programs.

New knowledge hubs

Because there are no existing websites for these two important crops, the James Hutton Institute is developing websites for finger millet and grasspea that will gather key resources, updates and events to serve as go-to knowledge hubs for the respective research communities.

COVID-19 EFFECT

Despite COVID-19 causing some work disruptions and delays, the Pre-Breeding Project's grasspea and finger millet activities progressed largely on schedule.

> **"This project is using exciting new methods and tools, like speed breeding and genomics, to revolutionize the breeding of improved varieties of neglected crops, which will get climate-smart crops into the hands of smallholder farmers more quickly."**
>
> **BENJAMIN KILIAN** PRE-BREEDING PROJECT LEAD AND SENIOR SCIENTIST PLANT GENETIC RESOURCES

SAFER GENEBANKS
TODAY AND TOMORROW

AT A GLANCE

The CGIAR Genebank Platform supports the core activities of the 11 CGIAR genebanks and germplasm health units (GHUs) to conserve and make available crop, forage and tree diversity, now and into the future. The Platform was established in 2017 and will run until the end of 2021.

PROJECT TITLE: The CGIAR Genebank Platform

CGIAR Genebank Platform

FUNDING PARTNERS: The Crop Trust, the German Federal Ministry for Economic Cooperation and Development (BMZ), the European Commission, the Government of the United Kingdom, the Government of Finland, CGIAR Window 1 donors and individual donors

IMPLEMENTING PARTNERS: The 11 CGIAR genebanks, Germplasm health units, Alliance-Bioversity International Policy Module

AfricaRice in Côte d'Ivoire

International Maize and Wheat Improvement Center in Mexico

International Potato Center in Peru

World Agroforestry in Kenya

International Center for Agricultural Research in the Dry Areas in Morocco and Lebanon

International Crops Research Institute for the Semi-Arid Tropics in India

International Institute of Tropical Agriculture in Nigeria

International Livestock Research Institute in Ethiopia

International Rice Research Institute in the Philippines

Alliance

Bioversity International in Belgium

International Center for Tropical Agriculture in Colombia

Carry on conserving

Pandemic lockdown measures disrupted operations at all 11 CGIAR genebanks. Staff had to find new ways to work to continue the routine tasks necessary to keep collections safe.

Despite the disruptions, however, a wide range of projects continued under the Platform.

Activities included working with genebanks to analyze their genotypic diversity, piloting automated processes, mainstreaming cryopreservation and developing tools and partnerships to increase use of the crop diversity in collections. The Platform also partnered with low-income countries to help them fill gaps in their genebank collections.

The International Potato Center (CIP) genebank manages seed collections of crop wild relatives as well as managing one of the largest tissue culture *ex situ* collections in the world. MICHAEL MAJOR/CROP TRUST.

A roadmap for genebanks

This year marked an important milestone in the Crop Trust's coordination of CGIAR genebanks, with the completion of a second phase of technical and costing reviews of all genebanks.

The technical reviews were based on the SOPs that have been documented and audited over the past six years and provided a depth of insight that had not been possible before. The reviews resulted in funded workplans for implementation in 2021 that will address major recommendations.

The costing reviews repeated a 2010 study that originally informed the Crop Trust's Endowment Fund target. By examining in detail all costs covered by the budgets provided to genebanks for essential operations, the Crop Trust ensures budgets are fair and appropriate, and can plan for future long-term agreements supported by the Endowment Fund.

Chatham House Dialogue

The Genebank Platform produced a set of background papers for a System Level Review of Genebank Costs and Operations. The review itself was carried out by a panel chaired by Geoff Hawtin OBE and made up of representatives from the Crop Trust, CGIAR, the Plant Treaty Secretariat and expert consultants.

In collaboration with the UK think tank Chatham House, a consultation with 35 thought leaders in agricultural development and food systems provided a wider context to build a future vision of genebanks and inform the panel's discussion.

> **"Genebanks faced major challenges in 2020, but, thanks to the extraordinary efforts of genebank staff, collections of crop diversity under the CGIAR Genebank Platform remain safe."**
>
> **CHARLOTTE LUSTY** GENEBANK PLATFORM COORDINATOR AND HEAD OF PROGRAMS

COVID-19 EFFECT

Several CGIAR genebanks and GHUs were forced to close temporarily because of pandemic lockdowns. However, critical monitoring of the collections continued. Once genebank staff were recognized as critical workers and new procedures were implemented, distribution of germplasm resumed. For some collections, staff had to work day, night and weekend shifts to maintain essential operations.

The pandemic highlights the importance of efforts made over the past nine years to safety-duplicate collections, particularly for crops that need constant attention (that is, held in the field or as tissue culture). In 2020, the Crop Trust facilitated efforts to review risk management planning and install equipment to enable remote management, such as automated irrigation, CCTV and alarms.

International Year of Plant Health

The UN General Assembly proclaimed 2020 as the International Year of Plant Health, with an array of events aimed at increasing global awareness of the importance of plant health for protecting the environment and boosting economic development. Led by the International Institute of Tropical Agriculture (IITA), CGIAR Germplasm health units (GHUs) contributed to the events with a series of webinars for Phytosanitary Awareness Week.

GHUs are essential for ensuring the safe international exchange of germplasm under national and international phytosanitary regulations. Working in regions where the capacity of national agencies is frequently limited, GHUs are literally the only way for crop diversity to be shared across international borders without the risk of introducing diseases to farmers' crops.

Focus on policy compliance

The Policy Module of the Genebank Platform, led by Alliance–Bioversity International, supports CGIAR in complying with policies and laws related to genetic resources and contributing to relevant international policy forums. In 2020, the Policy Module worked with the Open University to develop an online training course on genetic resources policy for students and scientists who work with genetic resources for breeding, conservation or exchange. The course, which will be ready in early 2021, is one of a series of tools that the Policy Module has developed under the frameworks of the Plant Treaty and the Convention on Biological Diversity.

Scan to watch recordings of the Chatham House Dialogue

FACING PAGE **The Chatham House Dialogue involved thought leaders from around the globe.**

ABOVE **Preparation of germplasm samples for virus indexing at IITA.** LAVA KUMAR.

A GROWING
BANK OF KNOWLEDGE

AT A GLANCE

The global system for *ex situ* conservation relies upon information management and sharing to operate successfully. Genebanks need data to operate efficiently. And to use genebank collections, it is essential to know which contain what. This means constantly improving data and data management systems.

In addition to supporting individual genebanks to make their own improvements, the Crop Trust supports initiatives to improve the management and availability of information at the global scale, including Genesys and GRIN-Global Community Edition.

Genesys continues to grow

Genesys is a global online platform for sharing information on genebank samples. The database collates data from 400 genebanks worldwide and ensures the data are compatible and meet agreed standards. Thanks to Genesys, accessing and using these data has become much easier for researchers.

The volume of data in Genesys continues to grow, with agreements to publish data signed with several data providers in 2020, including the Agricultural Plant Genetic Resources Centre (Sudan), the International Center for Biosaline Agriculture (UAE) and the Myanmar Seed Bank.

The Genesys team conducted a survey in 2020 to learn how to make the interface more user-friendly. They have been responding to this feedback by kickstarting efforts to make information on collections even more rich and accessible through the portal.

GRIN-Global Community Edition

GRIN-Global is a system for genebanks to store, manage and share information associated with their collections, originally developed in collaboration by the Crop Trust, the US Department of Agriculture (USDA) and Bioversity International.

In 2020, the Genebank Platform Data Management Community of Practice (CoP) adapted GRIN-Global to create "GRIN-Global Community Edition" (GG-CE), an open-source extension to the original software that adds helpful functions. GG-CE aims to help genebanks better manage inventories of seed, field and tissue collections, support the use of mobile devices and barcoding for inventory management, and promote interoperability with other data systems such as Genesys.

> **"Building information systems that truly serve genebank technicians, curators, breeders and researchers is a key aspect of improving the global system for *ex situ* conservation."**
>
> **MATIJA OBREZA**
> GENEBANK INFORMATION SYSTEMS MANAGER

Scan to access the Genesys PGR Platform

GENESYS BY THE NUMBERS

- Genesys hosts information on more than 4 million accessions, 123 genebank subsets and more than 400 datasets of phenotypic data.
- Registered user accounts increased from 1,580 in March to over 1,800 by the end of 2020.

Genesys
Gateway to Genetic Resources

Upgrading genebanks' information management

Several Crop Trust projects include components aimed at strengthening genebank information management. Under the Crop Wild Relatives Project, information system upgrades were carried out in 2020 at the Myanmar Seed Bank, the National Genebank of Pakistan, the National Plant Genetic Resources Centre (Tanzania), and the Malawi Plant Genetic Resources Centre.

CGIAR international genebanks have been providing capacity-building support to the five African national genebanks participating in the Seeds for Resilience Project (those of Ethiopia, Ghana, Kenya, Nigeria and Zambia) by taking part in technical reviews and giving live demonstrations of genebank operations.

COVID-19 EFFECT

The pandemic was a double-edged sword for genebank information systems. The extra time available for desk work during lockdown gave staff an opportunity to focus on improving the quality of genebanks' data. However, remote working prevented staff from adding some new features and making developments that required on-site work and collaboration.

ABOVE **Seed samples at the CIAT genebank.** SHAWN LANDERSZ.

THE SVALBARD GLOBAL SEED VAULT

A cool success

The Svalbard Global Seed Vault marked a major triumph in February 2020 just before global lockdowns began, with the largest deposit since the Seed Vault first opened in 2008, in terms of the number of institutions to send seeds at one time. More than thirty genebanks deposited seeds, including first-time depositors such as the Cherokee Nation.

The February deposit was organized to occur simultaneously with another major event: the 2020 Svalbard Seed Summit in Longyearbyen. The summit highlighted once again the urgent need to safeguard crop diversity and encouraged nations worldwide to make use of the Seed Vault as part of their national strategies to secure important seed collections.

Stefan Schmitz, Executive Director of the Crop Trust, chaired the final session of the summit, which included messages from the Prime Minister of Norway Erna Solberg and the President of Ghana Nana Addo Dankwa Akufo-Addo. Hindou Oumarou Ibrahim, a Sustainable Development Goals (SDG) Advocate, read out the *Arctic Call to Action on Food Security and Climate Change*, which was then signed by Prime Minister Solberg and President Akufo-Addo.

COVID-19 EFFECT

By sheer luck, it was possible to celebrate the Seed Vault's February deposit as planned, shortly before world travel shut down. The other two vault openings for the year were carried out on schedule, although some participating genebanks had to postpone their shipments because of the pandemic.

AT A GLANCE

The Svalbard Global Seed Vault is a long-term seed storage facility holding back-ups of the world's collections of crop diversity. It's deep inside a mountain on a remote island in the Svalbard archipelago and is opened a few times a year for deposits from genebanks all over the world.

The Seed Vault is established and owned by Norway and operated as a partnership between the Norwegian Ministry of Agriculture and Food, the Nordic Genetic Resource Center (NordGen) and the Crop Trust.

A 100-year experiment

In August 2020, the Seed Vault launched a unique experiment that will end a century from now. The experiment, the first of its kind, seeks to understand the longevity of the seeds of 13 globally important crops deposited in the Vault. The seeds in the experiment will be tested for germination in 2030, and every decade thereafter, until 2120. The experiment is funded by the Norwegian Ministry of Agriculture and Food and involves partners from all over the world.

Despite the restrictions of the pandemic, the Seed Vault opened for a third time in 2020. In October, eight institutes sent 45 boxes, containing approximately 15,000 seed samples.

FACING PAGE **An overhead view of the entrance to the Svalbard Global Seed Vault.** BRG JBERGER.

"The presence of the Norwegian Prime Minister and her guests at the latest seed deposit at Svalbard clearly underlines the importance of the Seed Vault and its role in conserving critical crop diversity worldwide."

LISE ALBRECHTSEN SPECIAL ENVOY FOR CLIMATE ADAPTATION AND FOOD SECURITY, NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

THE YEAR IN NUMBERS

42 genebanks sent seeds to the Seed Vault

9 new genebanks added to the Seed Vault depositor family

82,501 samples deposited

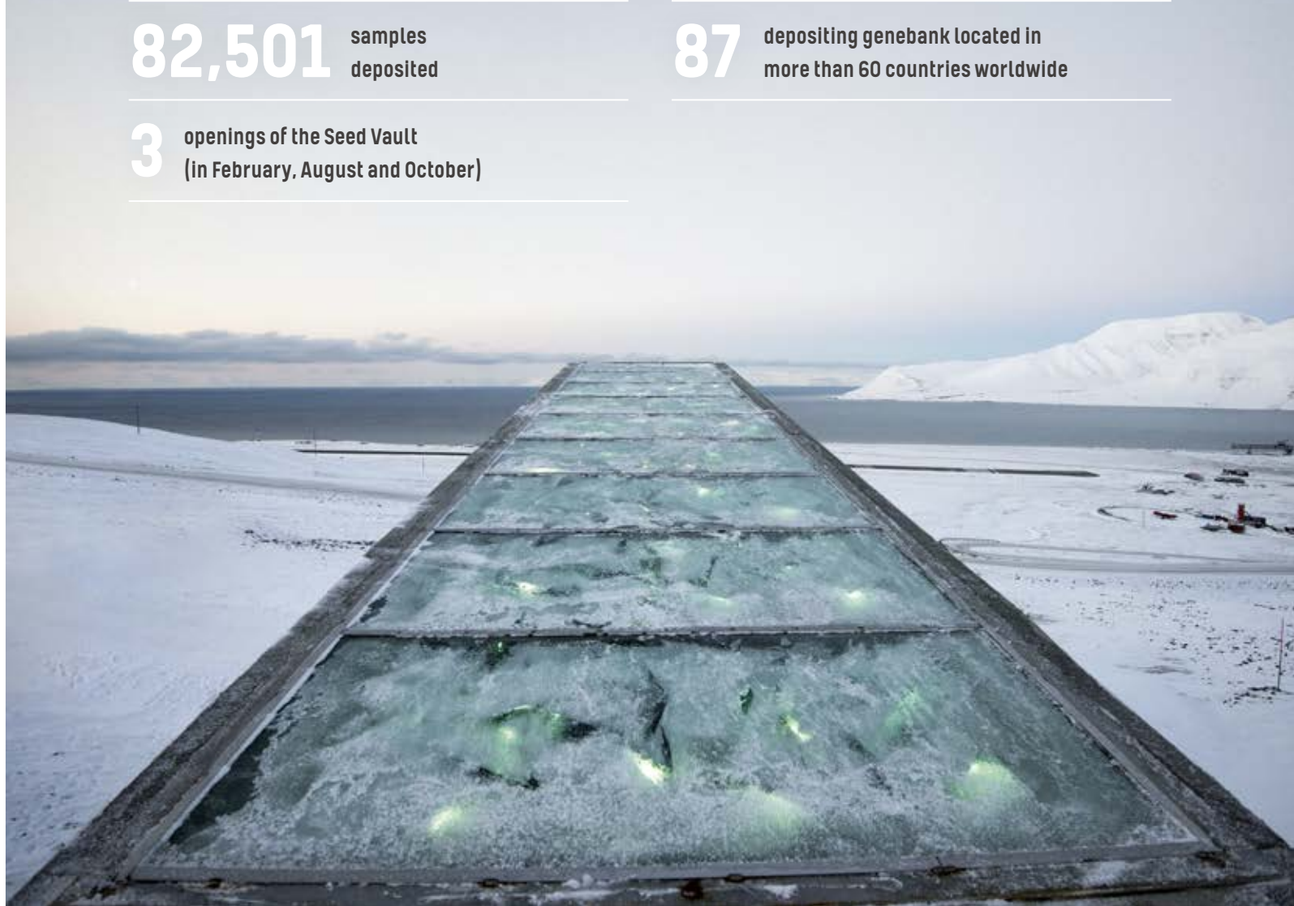
3 openings of the Seed Vault (in February, August and October)

THE SEED VAULT IN NUMBERS

1,074,533 samples safeguarded

1,116 genera represented

87 depositing genebank located in more than 60 countries worldwide



STRENGTHENING GENEBANKS IN AFRICA

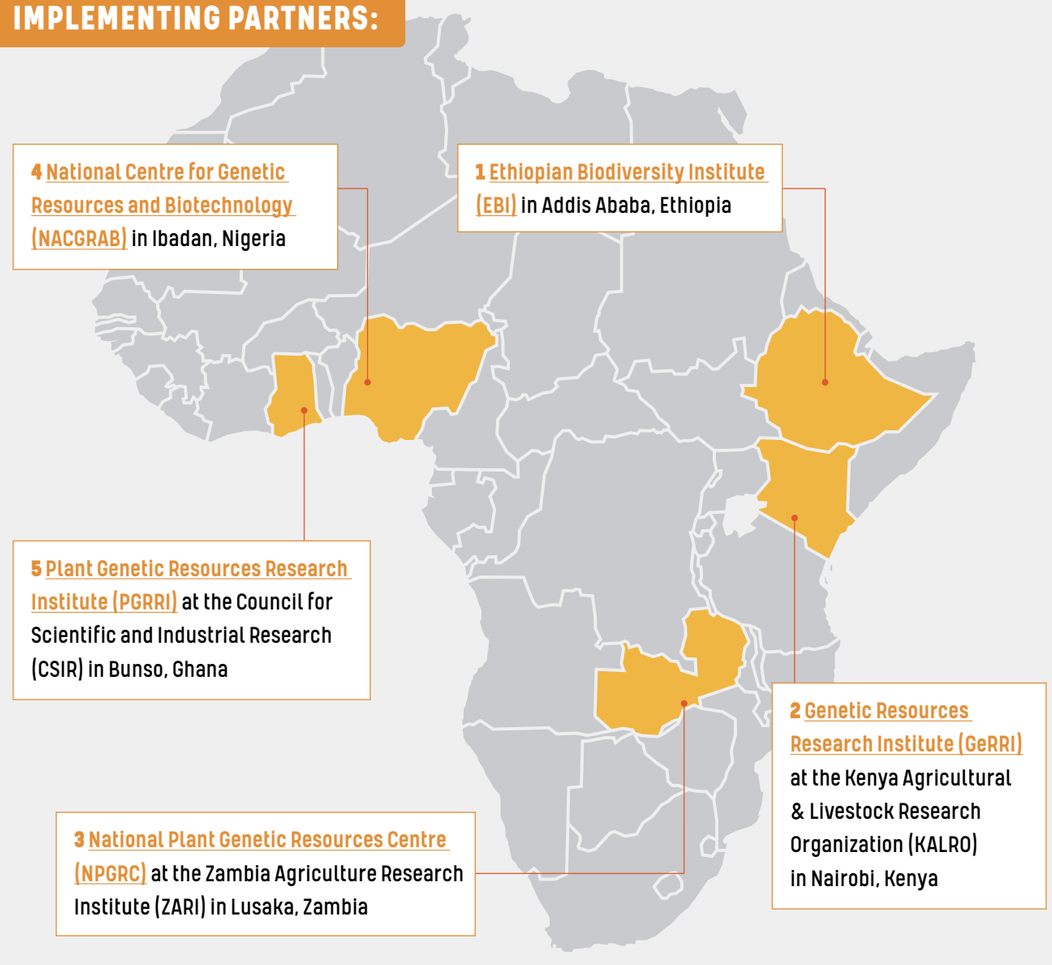
AT A GLANCE

The Seeds for Resilience Project supports five national genebanks in Africa to conserve, share and use their collections of key crops to build more resilient and diversified food production.

PROJECT TITLE: National Seeds Collections for Climate-Resilient Agriculture in Africa

FUNDING PARTNER: Government of Germany (BMZ), through the German Development Bank (KfW)

IMPLEMENTING PARTNERS:



"Even amid the immense challenges of pandemic lockdowns, Seeds for Resilience partners enthusiastically embraced the goal of strengthening their operations to safeguard unique crop diversity."

NORA CASTAÑEDA-ÁLVAREZ SEEDS FOR RESILIENCE PROJECT MANAGER

Setting priorities for building resilience

The Seeds for Resilience Project completed its first full year in 2020, supporting national genebanks in Nigeria, Zambia, Kenya, Ethiopia and Ghana to step up their efforts to safeguard their collections efficiently and effectively.

Activities in 2020 were guided by reviews of the genebanks conducted in late 2019. Staff at partner genebanks identified priority crop collections—totaling 60,000 accessions—and created their plans and budgets for better conserving, safety duplicating and sharing crop diversity. They also studied quality management systems and the GRIN-Global data management software and documented standard operating procedures for such key tasks as germplasm distribution and seed conservation.

In July 2020, a Community of Practice (CoP) on Communications was formed. This CoP, designed to bring together the communications staff of partner genebanks, is building a space to share ideas and knowledge on communications and outreach.

Other activities focused on identifying key user groups and preparing work plans—to grow ever stronger in the years to come.

Priority crop collections

barley, beans, cassava, coffee, cowpea, enset, finger millet, forages, okra, pearl millet, pigeon pea, rice, species of the genus *Solanum*, sorghum, sweet potato and yam

COVID-19 EFFECT

Project participants were unable to meet and learn together in person, but planned meetings were replaced with virtual ones.

ABOVE **Finger millet grows in farmer's field in Kenya.** MICHAEL MAJOR/CROP TRUST.

THINKING GLOBALLY, **ACTING TOGETHER**

Laying down the foundations

Significant progress was made on seven strategies in 2020. New strategies were drafted for groundnut, cucurbits, temperate forages, pea and vanilla, and updates to the yam and millets strategies were drafted. An updated potato strategy is also underway.

The project supported surveys to collect information on existing collections for each of these crops. It also analyzed data from a variety of sources to develop a global overview of existing collections. Data sources included Genesys and FAO's World Information and the Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS). Finally, project staff integrated the results of gap analyses conducted by the Genebank Platform into the crop strategies.

COVID-19 EFFECT

The project was largely unaffected by the global pandemic as work could continue online. Planned consultation meetings were conducted virtually.

AT A GLANCE

The global crop conservation strategies bring together the latest information from experts and institutions worldwide to plan and prioritize actions in support of the long-term conservation and availability of crop diversity. The Crop Trust is facilitating the update of five existing global crop conservation strategies and the development of ten new strategies for this 3-year project that began in July 2019.

FULL PROJECT TITLE: Breathing New Life into the Global Crop Conservation Strategies: Providing an Evidence Base for the Global System of *Ex situ* Conservation of Crop Diversity

FUNDING PARTNER: German Federal Ministry of Food and Agriculture (BMEL), implemented by the Federal Office for Agriculture and Food (BLE)

> **"By looking at the conservation of crop diversity at the global level, the crop conservation strategies promote activities and set priorities that are coordinated among stakeholders and genebanks around the world."**
>
> **PETER GIOVANNINI** GLOBAL CROP CONSERVATION STRATEGIES PROJECT COORDINATOR

FACING PAGE Groundnuts at the ICRISAT genebank, India. SHAWN LANDERSZ.

PIVOTING TO **DIGITAL-FIRST COMMUNICATIONS**

LEFT The Crop Trust-led panel on pre-breeding at the GLF Biodiversity Conference "One World, One Health".

FACING PAGE Dishing up diverse ingredients at Food Forever Pocono. THE CROP TRUST.

GOING VIRTUAL

APRIL

- The Crop Trust and Botanic Gardens Conservation International (BGCI) collaborated to transform the Food Forever Global Exhibition for the Royal Botanic Garden Edinburgh into a fully digital exhibit

MAY

- The Crop Trust hosted a "GLF Live" event on COVID-19 and its impact on genebanks on the Global Landscapes Forum's digital platform

JUNE

- The Crop Trust became the 29th Charter Member of Global Landscapes Forum
- The Crop Trust participated in the Global Landscapes Forum Bonn Digital Conference, at which Executive Director Stefan Schmitz delivered a plenary speech to thousands

SEPTEMBER

- The Food Forever Initiative co-hosted the Pocono Organics Food Forever Experience, where Crop Trust Executive Director Stefan Schmitz and Crop Trust Board Chair Peter Crane delivered plenary speeches

OCTOBER

- Genebank Platform staff led the Chatham House Dialogue on the future of genebanks
- The Crop Trust and the Food Forever Initiative hosted three live sessions and three 'lightning talks' at the Global Landscapes Forum Biodiversity Digital Conference "One World, One Health", at which Executive Director Stefan Schmitz delivered a 'Thought Leaders' address to thousands

DECEMBER

- The Crop Trust co-hosted the second Food+ Summit in collaboration with *Foreign Policy* magazine, where Executive Director Stefan Schmitz participated in a plenary panel

COVID-19 EFFECT

From February, the COVID-19 crisis made a swift transition to digital communications a necessity. Outreach and engagement activities pivoted to be digital-first. Several events planned in 2020 by the Food Forever Initiative had to be canceled or transformed into virtual events or projects. Owing to this, FFI was granted a no-cost extension to July 2021.

Online, on brand, on target

The Crop Trust's Communications Unit was restructured in 2020, complete with a comprehensive digital-first strategy, new processes and policies, and two new staff members. All Crop Trust events swiftly switched to digital, the team focused on increased outreach through partnerships with high-reach platforms to expand their own reach, and deliver messages to key audiences and communities.

Participation in high-reach digital events increased views and reach substantially and, at the same time, dramatically cut travel and conference expenditure, resulting in a high return on investment.

The changes reaped benefits. Through leveraging partner platforms, the Executive Director's editorials, speeches and blogs, attracted more than 20 times as many views as before.

The Crop Trust became the 29th Charter Member of Global Landscapes Forum (GLF) in June 2020, and subsequently participated in major GLF global events, reaching thousands of people worldwide.

The Communications Unit looks forward to increased social media campaigning capacity in 2021, to a new institutional website, and to an ever-expanding, comprehensive roster of consultants to enable the Crop Trust to respond to the global news cycle, and engage audiences and communities with clear messaging in pursuit of achieving the Crop Trust mission.

FOOD FOREVER

The Food Forever Initiative (FFI) concluded a successful third year of raising awareness for more diverse and resilient food systems thanks to the joint support of the governments of Germany, the Netherlands, Norway and Switzerland and the leadership and guidance of the UN Food and Agriculture Organization.

FFI is perhaps best known for its in-person events. But COVID-19 meant that only one could go ahead in 2020: a dinner in January at the Davos World Economic Forum Annual Meeting, co-hosted by the World Wide Fund for Nature (WWF).

With physical events canceled, the project swiftly moved the rest of its programming online. The result was a series of podcasts, produced in collaboration with the Chef's Manifesto, highlighting a chef and guests from the fields of cooking and science discussing key crops; and a video series entitled "Biodiversity for Resilience" that explores the importance of agrobiodiversity from various angles.

In addition, thanks to a partnership with the Future Food Institute, a think tank based in Bologna, Italy, the project participated in three digital bootcamps on agrobiodiversity, involving students, private sector representatives, NGOs, and activists.

RISING TO THE OCCASION FROM HOME

AT A GLANCE

Stefan Schmitz joined the Crop Trust as Executive Director in January 2020 and began to implement changes to grow the organization's capacity.

In response to global conditions and the World Health Organization (WHO) declaring COVID-19 a global pandemic, the Crop Trust quickly shifted to different degrees of remote work for all staff and implemented regular COVID-19 updates and a Business Continuity Plan.

Despite additional challenges in 2020, the 3-year ICT Digital Roadmap Implementation project continued as planned.

New leadership and structural adjustments

Dr. Stefan Schmitz joined the Crop Trust as its Executive Director in January 2020. During his first year, Stefan initiated several changes to the Crop Trust's structure to strengthen partnership engagement, communications, and innovative finance capacity, better positioning the organization to achieve its long-term strategic objectives.

Coping with constant change

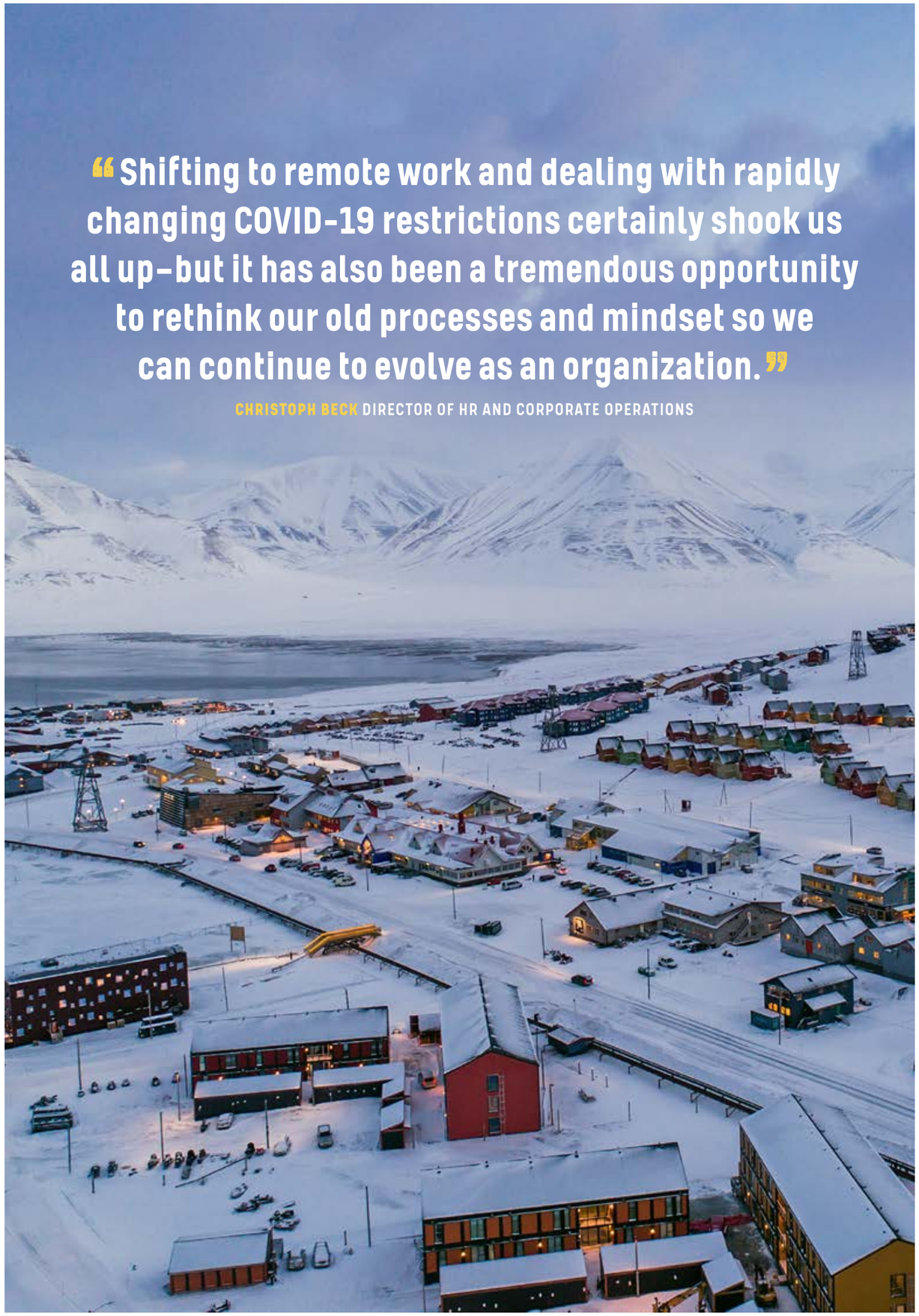
The Crop Trust responded rapidly to the changing global conditions throughout 2020. With the approval of the Executive Board, the Crop Trust rolled out a Business Continuity Plan for 2020/2021 in March, outlining necessary steps to cope with ongoing challenges and minimize risk across the organization—from ensuring that Crop Trust staff had access to needed equipment to making certain that all technical deliverables could be produced to anticipating impacts on fundraising through the end of 2020 and beyond.

Digital roadmap on track

In 2019, the Crop Trust initiated a 3-year project to overhaul its ICT systems, implementing state-of-the-art systems to meet the highest international standards and improve internal efficiency, while simultaneously updating related internal processes for project auditing and reporting. Learning the new ICT system and related processes demanded a large time commitment for nearly all Crop Trust staff in 2020.

COVID-19 EFFECT

Restrictions related to COVID-19 hindered staff professional development; put additional strain on individuals, especially those caring for children and other family members; and the shift to online working halted the everyday casual conversations that make office life enjoyable. The Crop Trust rose to the occasion by offering more flexible working conditions, making a dedicated counselor available to all staff, holding virtual "Happy Hour" events and subscribing to an online learning platform.



FACING PAGE **Longyearbyen, Norway, the nearest town to the Svalbard Global Seed Vault.** MICHAEL POLIZA.

FUNDING CROP DIVERSITY IN PERPETUITY

AT A GLANCE

The Crop Diversity Endowment Fund is the key financial instrument that underpins the Crop Trust's mission, providing the means for the Crop Trust to create a permanent legacy of support for genebank collections of critical importance to the global food supply. The Endowment Fund had a successful year in 2020, despite the high level of volatility in capital markets. The Endowment Fund currently has a value of USD 365.5 million; the Crop Trust's aim is to increase the fund to USD 850 million.

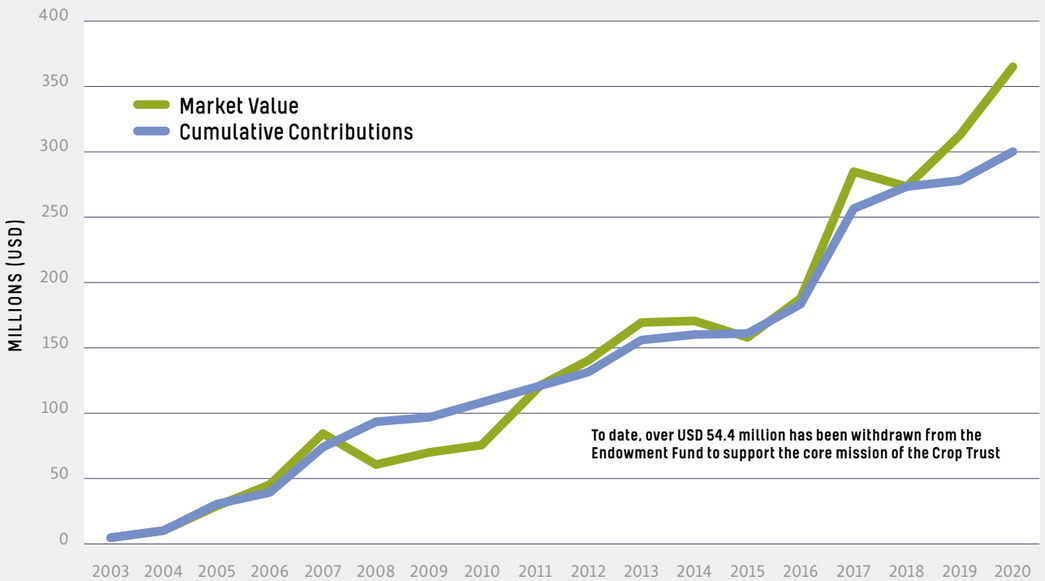
Endowment Fund growth

In 2020, total new contributions to the Endowment Fund of USD 17.9 million were received from donors. The Government of Germany made a contribution of EUR 10.8 million (USD 12.4 million), and the United States Agency for International Development and the Government of India made further donations of USD 5.4 million and USD 0.1 million, respectively.

Thanks to these contributions and an annual net investment return of 13.6% for 2020, the value of the Endowment Fund reached USD 365.5 million by 31 December 2020, compared with USD 312.8 million at the end of 2019. Investment income generated by the fund is used to support genebanks and related programs that conserve crop diversity.

USD 54.4 million has been allocated from the Endowment Fund to support the CGIAR Genebank Platform and Crop Trust operations since 2005.

Crop Trust Endowment Fund Growth Market Value vs. Contributions



> "The Endowment Fund is an exciting idea to provide a sustainable, long-term financing mechanism and make possible the Crop Trust's important work of safeguarding crop diversity in perpetuity."
>
> **VICTORIA SANT** SENIOR ADVISOR AT THE INVESTOR FORUM AND CROP TRUST FINANCE & INVESTMENT COMMITTEE MEMBER

Total expenditures

Program activities, including the Crop Wild Relatives Project, the development of crop strategies, the Genebank Platform and the Crop Trust's long-term grants for the daily work of crop conservation by key genebanks, together with Crop Trust's operational activities, accounted for a total expenditure of USD 32.8 million in 2020, of which USD 30.9 million was related to projects. Operational expenditures made up 5.7% of total direct expenditures.

Withdrawals of USD 10.7 million from the Endowment Fund in 2020 represented 4% of assets, in line with the approved spending policy. The Executive Board made the decision to withdraw 4% of assets to fund the CGIAR Genebank Platform program commitment for 2020, with any unspent balance to be considered an unrestricted reserve toward the 2021 commitment to the Platform.

To date, over USD 54.4 million (2019: USD 44 million) has been withdrawn from the Endowment Fund to support the core mission of the Crop Trust. Of the USD 10.7 million withdrawn in 2020, USD 6.3 million was allocated for use in 2020 and these funds were used to support the CGIAR genebanks (USD 6.1 million), the Svalbard Global Seed Vault (USD 0.15 million) and to cover a long-term grant to the Pacific Community (USD 0.06 million). The funds withdrawn were supplemented by an additional USD 5.8 million provided for the Genebank Platform by the European Commission and the Government of Finland.

Financial auditing

The Crop Trust's financial statements for 2020 were prepared in accordance with International Financial Reporting Standards. They were audited by PriceWaterhouseCoopers GmbH Wirtschaft-sprüfungsgesellschaft (PwC) with an unqualified audit opinion. PwC has served as the Crop Trust's external auditor since 2013.

Scan to read the full 2020 Crop Trust Financial Reports

COVID-19 EFFECT

The Endowment Fund is highly diversified and structured for the long term so that it can withstand short-term market volatility, whether positive or negative. In part because of this structure, the COVID-19-related market fluctuations of 2020 did not negatively affect the year's returns.

Many Crop Trust activities were reduced or delayed last year owing to COVID-19 restrictions and lockdowns, leading to a temporary reduction in operational and program costs for 2020. However, these delayed activities are expected to take place in 2021.

LOOKING AHEAD
RESPONSIBLE INVESTING AND INNOVATIVE FINANCE

Investing in the future

The Crop Trust considers integrating environmental, social and governance (ESG) concerns into its investment process to be an important part of its investment strategy, and one that supports its broader mission and objectives. As a responsible asset owner, the Crop Trust believes responsible and sustainable investment and good financial stewardship will enhance the long-term performance of the Endowment Fund. Responsible investing aligns well with our mission to generate returns that can continue to support crop conversation and use for future generations.

The Crop Trust is a signatory to the United Nations Principles of Responsible Investment (UNPRI), an initiative that includes an international network of investors working together to put responsible investment into practice. As part of its commitment to the UNPRI, the Crop Trust is committed to undertaking annual UNPRI reporting, the results of which are publicly disclosed.

In line with the Crop Trust's commitment to environmental stewardship, we support the Paris Agreement, enacted in 2016, which commits all parties to adhere to nationally determined long-term strategies for reducing greenhouse gas emissions.

Towards an ESG Strategy

The Crop Trust is working with its investment managers to further develop its ESG Strategy and better integrate social factors, environmental concerns (such as climate change effects and net zero emissions), good stewardship and other such considerations to meet investment objectives.

Innovative finance

The Innovative Finance Working Group (IFWG) was established by the Crop Trust Donors' Council in June 2018 to review innovative finance mechanisms that could complement official development assistance and government grants in contributing to the Endowment Fund. The IFWG has identified possible solutions to provide additional, long-term sustainable funding that could be pursued by the Crop Trust.

In 2020, the IFWG focused primarily on developing a Food Security Bond (FSB) concept, and a feasibility study on the FSB was carried out. The Crop Trust is now in bilateral discussions with potential donors to move this initiative forward.

Collecting *Medicago* (alfalfa wild relative) seed in regeneration plots, ICARDA, Lebanon. MICHAEL MAJOR/CROP TRUST.

FACING PAGE Sprouts © MARYNA BOHUCHARSKA (UNSPLASH.COM)

"In this period of reduced overseas development aid and declining grants from governments, it has become necessary and urgent for the Crop Trust to explore new ways to engage a broader group of public and private donors in helping us reach our USD 850 million target."

JANET MUIR CROP TRUST DIRECTOR OF FINANCE

LETTER FROM THE CHAIR OF THE EXECUTIVE BOARD
SIR PETER CRANE

When we look back over the achievements and challenges of 2020, we cannot ignore the profound and ongoing effect of COVID-19.

As this crisis demonstrates, humanity cannot afford to become complacent. It is critical that we take steps now to insure our descendants against future crises—a goal at the heart of the Crop Trust's mission to safeguard crop diversity.

Given the work highlighted in this annual report, I thank the Crop Trust team with its Executive Director, Stefan Schmitz, and especially our many partners, for their commitment and adaptability, which made that work possible in the face of unprecedented disruption. As a result, the Crop Trust is building on the strong foundations laid during its first 15 years and is well equipped for whatever this new decade brings.

We are also pleased to report that, despite the pandemic, the Endowment Fund continued to generate strong returns in 2020. We extend our immense gratitude to all our donors and funding partners, for your ongoing commitment and dedication to our mission.

This year also saw changes to the Executive Board. We were delighted to welcome our newest members in 2020: Éliane Ubalijoro, Hanne Blåfjelldal, Jean-Christophe Gouache, MasaruIwanaga and Mercedes Araoz. We are also delighted that Bernard Lehmann and Joachim von Braun have joined the Executive Board from January 2021.

We also said farewell to two members this year: Alexander Müller and Knut Storberget, who both joined the Executive Board in 2015. We are deeply grateful for their dedicated service to the Crop Trust, and thank them for their invaluable guidance and commitment over the last five years. We wish them the very best in their next ventures.

In 2020, the world experienced enormous changes, of which we are yet to understand the full long-term effects, particularly on the ever-deepening, interlinked crises of climate change, biodiversity loss and food security.

But one thing remains unchanged, and clear: the importance of the Crop Trust's mission. I would like to take this opportunity to not only acknowledge, but to celebrate, the dedication of all those involved in that work—from Crop Trust staff to our many partners all over the world. Thank you all. Our mandate has never been more important.

SIR PETER CRANE FRS
CHAIR OF THE EXECUTIVE BOARD

Checking on barley at an ICARDA field site in Lebanon. SHAWN LANDERSZ.

“My time in the Executive Board of the Crop Trust has now come to an end but it has been one of the most important works I have thus far participated in. In 2020, COVID-19 revealed the vulnerability of our food systems and further demonstrated our global interconnectedness. In the midst of this ongoing crisis, it is clear that the Crop Trust’s mandate has never been more relevant or important.”

KNUT STORBERGET GOVERNOR OF INNLANDET AND FORMER CROP TRUST EXECUTIVE BOARD MEMBER

“We are excited about working with the Crop Trust to serve humanity. Not only will this collaboration help improve ICBA’s genebank but it will also contribute to safeguarding some of the world’s most important plant genetic resources with proven or potential salinity, heat and drought tolerance as public goods.”

TARIFA ALZAABI ACTING DIRECTOR GENERAL OF THE INTERNATIONAL CENTER FOR BIOSALINE AGRICULTURE (ICBA), ON THE MOU SIGNED BETWEEN ICBA AND THE CROP TRUST IN 2020

FACING PAGE Shelving germplasm samples at CIAT genebank, Colombia. SHAWN LANDERSZ.

“ The Crop Trust’s vision of a global system for safeguarding crop diversity supports all of humanity. I am proud to be part of this amazing mission to conserve the raw genetic materials needed to provide a more nutritious and varied food supply to all. Doing so will help ensure more equitable access to affordable and healthier food, fighting malnutrition now and for generations to come. ”

ÉLIANE UBALIJORO PROFESSOR OF PRACTICE AT MCGILL UNIVERSITY AND CROP TRUST EXECUTIVE BOARD MEMBER

CROP TRUST

THE CROP TRUST
Platz Der Vereinten Nationen 7
53113 Bonn, Germany
+49 (0) 228 85427 122
info@croptrust.org

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jim@jimsmithdesign.co.uk

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FACING PAGE Pre-breeding partners and farmer discuss use of alfalfa to restore paddock in the Patagonia region of Chile. LUIS SALAZAR/CROP TRUST.

CROP TRUST

SECURING OUR FOOD, FOREVER

THE GLOBAL CROP DIVERSITY TRUST
Platz Der Vereinten Nationen 7, 53113 Bonn, Germany
+49 (0) 228 85427 122 info@croptrust.org