

INTERVIEW

Q+A: Seed banks – critical for climate adaptation



Genetic diversity conservation in the spotlight at GLF Nairobi



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A Kenyan farmer pots up a seed. Photo by Patrick Shepherd/CIFOR-ICRAF

The effects of climate change are putting today's crops at risk. It is vital to conserve seeds of different crop varieties so that plant breeders can use them to develop crops with greater tolerance to flooding and high temperatures while resisting drought, pests, and diseases.

As countries strive to fulfil pledges to restore vast areas of degraded forest landscapes, there are also numerous challenges associated with collecting, storing, and distributing tree seeds from wild species with sufficient genetic diversity.

Last week, the Global Landscapes Forum (GLF) conference GLF Nairobi 2023: A New Vision for Earth called for urgent action to better prepare our planet's people and landscapes for the effects of climate change. On the first day of the event, crop and tree genetic resource conservation experts spoke about the importance of seedbanks in conserving genetic diversity and ensuring the availability of seeds at a joint CIFOR-ICRAF and Crop Trust side event.

Éliane Ubalijoro, CIFOR-ICRAF's chief executive officer, opened the event with a call for transformation to stabilize our climate and provide a growing global population with enough nutritious food. "The importance of seed banks in achieving this goal cannot be underestimated," she said. "They conserve the world's seed diversity including our food crops and trees, and they share the diversity with scientists and farmers to make our food systems on our planet as resilient as possible."

Crop Trust executive director Stefan Schmitz closed the session with the insight that "diversity in principle is what matters. We need it in order to transform our agri-food systems – especially with neglected and underutilized species. So much needs to be done, and so much diversity still needs to be conserved before it is lost forever."

Forests News asked the speakers for some insights into their research, passion for diversity, and views about genebanks in Africa.

Forests News: Why is it important to conserve and utilize crop and tree diversity?

Sunday Aladele, research director and former executive director of Nigeria's genebank, the National Centre for Genetic Resources and Biotechnology (NACGRAB): Crop diversity offers options. It gives us the raw materials that possess the necessary genes that breeders will use to develop new crop varieties with important climate-resilient traits. It also provides better livelihoods to farmers, consumers and industries in the face of unexpected climatic challenges.

Ramni Jamnadass, principal scientist and research leader at CIFOR-ICRAF: As for agrifood systems, healthy, resilient forests and agroforests require substantial diversity at the species and genetic level. Tree species diversity allows for varied food sources,



habitat structure, ecological functions, and stability against environmental stresses.

Chrispus Oduori, chief research scientist of Kenya Agricultural & Livestock

Research Organisation (KALRO), Kibos Centre: Crop diversity makes the process of ‘pre-breeding’ possible. This is basically the development of new genetic materials by crossing wild or unadapted plant relatives of crop species with cultivated crops to introduce desirable novel traits into breeding programs.

Asmund Asdal, coordinator of the Svalbard Global Seed Vault at the Nordic Genetic Resource Centre (NordGen): Genebanks conserve and make these crucial resources available for breeding and research. The Svalbard Global Seed Vault provides an extra level of security for the resources by saving duplicates of the seeds and the genetic resources under optimal conditions in a safe place.

Forests News: What are the challenges of managing seedbanks in Africa?

Aladele: The challenges for most of our seedbanks are financial: poor budgetary allocation from governments, poor infrastructure, and inconsistent policies. To navigate this, we need to work in a smart yet cautious way. We have to make sure that collections are kept to very low or manageable sizes, and that regeneration is carried out slowly at reasonable intervals, based on requests, distribution, and viability assessments.

Forests News: What inspires you personally in your work to conserve crop biodiversity?

Oduori: I grew up with my grandmother, a passionate farmer, who used to grow many crops. She would intercrop finger millet with sesame. As I grew older,

finger millet production declined, and sesame disappeared. And so did the quail, which is a delicacy in western Kenya. It turns out that the quail used to eat these crops and couldn’t survive without them. This experience awakened my desire to work on improving finger millet.

Asdal: It is very satisfying to be part of a global effort that is so important for the future. What inspires me the most is to be in contact with—and work with—so many skilled and enthusiastic people in many genebanks all over the world.

Forests News: How are these collections being used to improve communities' livelihoods?

Jamnadass: With a good range of tree species, forests can provide abundant food, support complex wildlife, enrich ecological processes, and withstand disease outbreaks. Genetic diversity within each tree species provides adaptations, evolutionary potential, and fitness in changing conditions. Variable genes and traits allow trees to adjust to shifts in climate, compete against new pests, or take advantage of resource availability.

Aladele: Within the Seeds for Resilience project, seeds from the seedbank are given directly to farmers. Sometimes they make pleasantly surprising discoveries. For instance, a group of farmers in Kano State in northern Nigeria found a sorghum variety that could mature in half the usual time: two months instead of four. This meant their crop managed to 'beat' the drought season.

Forests News: Why is international cooperation important for helping collection holders around the world to back up their seeds in the Svalbard Global Seed Vault?

Asdal: No country or region is self-sufficient regarding plant genetic resources.



Luckily, the conservation and use of these resources have, over the years, been organized as a common international effort. International cooperation and funding programs also ensure that valuable resources belonging to countries in less developed parts of the world are conserved, backed up, and available for science and plant breeding for all countries – and for humanity.

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