

Africa Climate Week advances tree restoration pledges but a big seed shortage remains

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A stand of commercial eucalyptus trees, a conspicuous nonnative tree species, in Kenya. Credit: Neil Palmer/CIAT

If you are going to restore 24 million hectares of degraded land, a lot of

things need to go right. Sub-Saharan countries Burkina Faso, Cameroon, Ghana and Kenya plan to have that much land on track to being restored by 2030. While several components of the plan are in place, many others are not. Perhaps the most pressing is how to source and plant enough material from native tree species—seeds, seedlings and other material like cuttings.

The countries' commitments are commendable. As part of the African Forest Landscape Restoration Initiative ([AFR100](#)), the four nations represent almost a quarter of AFR100's goal. They boast high biodiversity in a region where 60% of the population relies on forests for food, timber and other essential ecosystem services. But that demand has helped drive sub-Saharan Africa's 10.4% loss of forests in the 20 years preceding the United Nations' Decade on Ecosystem Restoration and massive degradation of other tree-dominated biomes.

A new study found that while there is national-level political will and major international support for the restoration, seed systems—the multi-layered political, environmental, economic and cultural relationships that get native tree species flourishing in the ground—are not fully prepared yet. Based on extensive [results](#) published in *Diversity*, many in the public and private sectors involved in restoration are also not fully aware of the available resources.

"The four countries are making substantial progress toward their reforestation goals but risk falling short of their targets at present," said Chris Kettle, the principal investigator for this study and researcher for the CGIAR Initiative on Nature-Positive Solutions. "This can be fixed, however. Our results showed that demand for [native tree species](#) material is strong, but supply is lacking."

This isn't for a shortage of intact forests from which to source planting material. Despite the ongoing loss of native forests in these countries,

there is still currently enough diversity remaining to sustainably source enough of the 100's of tree species required for effective restoration. Communities who live closest to these seed sources are potentially key players—but, save a few cases, their involvement lacks behind potential despite offering green livelihood options

"Inviting local custodians of tree biodiversity to a stronger role in seed systems is perhaps one of the biggest keys to reaching restoration goals," said Marius Ekue, the Africa lead of the Alliance's Tree Biodiversity for Resilient Landscapes research group. "Their involvement could lead to more reliable seed availability, provide jobs in [rural areas](#) and increase incentives for conservation of biodiversity."

Researchers included members of CGIAR's Alliance of Bioversity International and CIAT, ETH Zurich, the University of Aberdeen and the University of Exeter.

Biodiversity & money matters

As is the case elsewhere in the tropics where tree biodiversity is the highest, many "restoration" projects rely heavily on nonnative trees that are already in strong demand. Teak and pine, for example, are farmed for their wood products. Eucalyptus is in high demand for scaffolding, cardboard production, and essential oil, and Acacia for fuel wood.

But these trees generally do little to support local flora and fauna, have short-lived carbon storage, and often place a high demand on water resources. They also [do little](#) to restore degraded landscapes and may contribute to degradation in the long run.

Changing business-as-usual practices will be essential to increasing the chances of success in forest landscape restoration (FLR) projects. But to give native tree diversity a bigger share of the restoration market, several

gaps need to be filled. (This is what is referred to as the "enabling environment," where policies, investment, capacities of land restorationists and incentives are aligned enough to lead to success.)

"The study highlights the urgent need for investment in the tree seed sector both public and private if seed systems are going to meet the demands placed by restoration commitments," said Fiona L. Giacomini, of ETH Zurich. "Previous work by the team shows this is the smart financial thing to do!"

How to FLR

Unfortunately, a reliable conveyor belt of native seeds, saplings and tree cuttings is not enough for successful FLR. Diversity within species is critical to growth and reproduction in restored areas: collecting a bunch of seeds from a few trees does not guarantee the needed diversity for a restored area to flourish. Climate is a concern.

Genetic variation within species can help young trees withstand the vagaries of today's erratic weather. Farmers and other restoration champions will also need to guide their efforts in alignment with climate models and weather patterns to choose the right moment to plant.

And each [tree species](#) has its own secret to success. They flower and produce seeds at different times (a calendar that is influenced by climate change). Some [seeds](#) tend to grow very easily (such as those dispersed by wind), while others (generally those that pass through the intestines of a bird, a bat or big mammals (e.g., an elephant) before being dropped a healthy distance from the original tree) need to be subjected to a box of tricks to coax them into germination.

Given the complexities ranging from the political and financial to the biological and climatological, it's easier to understand why FLR projects

can fail when solely directed from the top. This is yet another reason why local participation is key: knowledge of native trees, especially those traditionally used by rural communities, can provide key insights for successful propagation.

Researchers, too, are needed. Not just to produce the key information on genetic diversity and propagation, but to make that information accessible to the people executing FLR projects on the ground. Two new partnerships are helping make this happen.

One is [My Farm Trees](#), which helps provide incentives to communities to increase tree cover using native biodiversity. The platform includes documentation, verification and quality control needed.

Another is [Diversity for Restoration](#), or D4R, a tool designed to support decision-making for selecting trees and finding seed sources. Originally designed for dry tropical forests in Colombia, the tool now works across several countries in the Americas and Burkina Faso, Cameroon and Ethiopia.

"What clear is that to meet [restoration](#) targets, Africa will require [social movements](#) empowering everyone to do their part, tools like this enable everyone to have the information, and resources to make the best science-driven decisions to maximize impact," said Kettle.

More information: Fiona L. Giacomini et al, Seeding African Forest and Landscape Restoration: Evaluating Native Tree Seed Systems in Four African Countries, *Diversity* (2023). [DOI: 10.3390/d15090981](https://doi.org/10.3390/d15090981)

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