Case Study: Engaging International Fellows to Advance the Foundation's Strategic Academic Goals

As part of our ongoing commitment to fostering global collaboration and advancing our strategic initiatives, the Foundation launched a pilot Fellowship program in 2024 aimed at engaging young professionals from around the world in targeted research endeavors. This program, which we are developing into a reproducible model, seeks to harness the expertise and local knowledge of emerging leaders in various fields, aligning their efforts with the Foundation's broader goals of sustainability, conservation, and social impact.

One of the standout participants in this inaugural cohort is Mr. Samuel Kimani, an industrial engineer living and working in Kenya. Mr. Kimani's role in this program has been instrumental in shaping the Foundation's approach to reforestation in Africa—a critical area of focus given the continent's unique environmental challenges and opportunities.

Fellowship Overview:

Objective: The Fellowship is designed to provide young professionals with the opportunity to contribute to high-impact research projects that are of strategic importance to the Foundation. In this case, Mr. Kimani was tasked with investigating the current state of reforestation efforts across Africa, identifying successful projects, and profiling key stakeholders involved in these initiatives.

Scope: Mr. Kimani conducted in-depth research, leveraging his engineering background and local insights to produce a comprehensive report on Africa's most important reforestation projects. His work not only highlights the current landscape but also identifies critical success factors and challenges, offering a roadmap for future interventions.

Impact: Mr. Kimani's research serves as a launching pad for upcoming fundraising activities, as the Foundation seeks to support tree conservation efforts at the University of Antananarivo in Madagascar. However, the implications of his findings extend far beyond this specific initiative. His report is a valuable resource for anyone interested in reforestation and collaboration in Africa, offering insights that could inform policy, direct funding, and inspire further research.

Towards a Reproducible Model:

The success of Mr. Kimani's Fellowship has provided valuable lessons that will shape the Foundation's approach to future engagements. By developing a structured, yet flexible, framework for these fellowships, the Foundation aims to replicate this model across different regions and thematic areas. The goal is to create a network of international Fellows who can contribute to the Foundation's mission while advancing their own professional development.

In conclusion, Mr. Kimani's work exemplifies the potential of this Fellowship program to drive impactful research and foster international collaboration. As we refine and expand this initiative, we look forward to engaging more young professionals like Mr. Kimani, whose contributions are essential to achieving the Foundation's vision of sustainable development and environmental stewardship.

From Deforestation to Reforestation:
A Historical and Contemporary Analysis of Africa's Forests

JJSF Fellowship: International Correspondent Engagement

A Report by JJSF Fellow: Samuel Kimani (Industrial Engineering Graduate in Kenya)

Prepared as part of the JJSF Fellowship Program 2024

Table of Contents

Africa's Green Legacy

The forests of Africa exude an ambiance that has become known, to many, as the continent's cultural totem of natural wealth. The expanse of this important resource has ignited pristine dialogue around the unique interaction between nature and the social, economic, political, and religious frontiers of African living. How a forest could be the lifeblood of natural flora and fauna and still hold deep ancestral significance to rural communities has remained a defining feature of Africa's vast jungles. The woodlands and rainforests of sub-Saharan Africa (SSA) account for the largest proportion of Africa's dry forests and constitute between 14 and 16% of the earth's total forest cover (the Food and Agriculture Organization [FAO], 2020; GFZ, 2024). These vast forestlands host a rich biodiversity that balances natural phenomena, including water flow, climate patterns, and soil retention (Chidumayo & Marunda, 2010).

The importance of rainforests as a natural source of livelihood in Africa stems from the reality that this continent is the most poverty-stricken in the world. As ever, humans continue to exert tremendous pressure on Africa's rainforests by unsustainably harnessing natural resources to meet and sustain their livelihood demands. For instance, about 60 to 80% of Africa's rural households depend on charcoal as wood fuel, with wood products contributing roughly 75% of all household energy needs in SSA (Chidumayo & Marunda, 2010; Yirdaw, 1996). The extensive use of Africa's forestland and its resources in activities such as agriculture, livestock farming, urbanization, fuelwood sourcing, and logging has resulted in severe deforestation and other related ecological repercussions. This paper aims to explore the extent and status quo of deforestation against the backdrop of SSA's geographically different forest regions. The paper then details a chronological history of deforestation across Africa's forestlands, a discussion of its causes and effects, and the current state of awareness regarding forest protection and activity control. In the interest of exploring current efforts in eradicating deforestation across SSA, this paper also outlines current initiatives focusing on reforestation and land restoration.

The Poverty-Deforestation Cycle in Sub-Saharan Africa

Human encroachment and agricultural activity on forestlands have existed for millennia; in fact, deforestation may have been occurring for as long as humans have been practicing agriculture (Hosier, 1988). It was not until recently, following the emergence of global awareness to combat climate change, that deforestation became a pressing issue demanding urgent preventive and restorative action for SSA's forests (Chatham House, 2023). A sensible first step to understanding the nature of deforestation would be to source a definition for the term. The FAO termed it as "the conversion of Forest to other land use independently whether human-induced or not" (FAO, 2020a, p. 6). A more human-centered definition of deforestation, offered by the United Nations Framework Convention on Climate Change (UNFCCC), is "the direct human-induced conversion of forested land to non- forested land." (UNFCCC, 2002, as cited in Chirwa & Adeyemi, 2020, p. 197). In both definitions, human activity plays an undeniable role in the depletion of forestland.

Understandably, then, the extent of deforestation, as witnessed in SSA, alludes to the pressure applied to forestland by human activity. Much of this activity is driven by poverty and limited livelihood choices (Chidumayo & Marunda, 2010). Forests constitute a bountiful ecosystem that provides SSA's rural inhabitants with a plethora of edible fruits, plants, and game meat to avert famine and food insecurity. Much as human dependence on forestland offers a safety net for nutritional needs, SSA's woodlands and dry forests also support local industrial activity through the production of wood and non-wood forest products. Commodities ranging from timber to beeswax help sustain a formal revenue economy in SSA, which critically lowers the bar for overexploitation (Chidumayo & Marunda, 2010).

There has been extensive research probing into the impact of deforestation across the world's tropical rainforests; however, the effects of deforestation on dry forests and semiarid ecosystems remain less known (Hosier, 1988). Some, like Lugo and Brown (1982), have reasoned that deforestation occurs in consonance with life zones; that is, drier areas experience more deforestation due to accessibility that is limited in heavily moist areas. Therefore, drier forestlands may have undergone relatively more denudation over the

centuries compared to rainforests and subhumid woodlands (Hosier, 1988). Another argument is the absence of strong advocacy against encroachment in tropical semiarid forests, which results in wider destruction than densely moist forestlands (Janzen, 1987). Drier zones have a lesser capacity to support sustainable agriculture, extensive pasturage, or charcoal production and will thus be easily destroyed.

The Statistical Canopy: Numbers and Narratives

The largest proportion of forest cover in the world is in SSA — this region alone accounts for 80% of all dry forests in the world. The largest proportion of these forests are in central (37%) and southern Africa (28%) (Nair & Tieguhong, 2004). Despite this tremendous figure, forestlands cover a mere 6% of Africa's total land area despite being a source of sustenance to over half of the continent's population (Bodart et al., 2013; Freedman, 1995). The highest volume of global deforestation within the last century occurred in Africa's dry forests. There was a record 70% loss within the last 25 years of the twentieth century (Bodart et al., 2013), with humid tropical forests constituting about a sixth of this loss in SSA (Brink & Eva, 2009).

Globally, forested areas have been declining at a rate of about 0.13% each year between 1990 and 2015 — much of this decline has occurred in Africa and Europe (Sánchez et al., 2018). Over this period, forest cover in Africa's forestlands dropped from 24.9% to just over 21% (African Forestry and Wildlife Commission [AFWC], 2022). The 2020 Global Forest Resource Assessment (FRA) report by the FAO indicated that Africa had the worst annual deforestation of the 2010s, with the forested areas of eastern and southern Africa accounting for the largest loss (FAO, 2020b). A depreciation rate of 4.1 million hectares over ten years, starting in 1990, rose to 4.31 million hectares in the decade leading up to 2010 and further up to 4.41 million hectares between 2010 and 2020 (FAO, 2020). Despite these increments, the annual deforestation rate was reduced by 4.9% between 2010 and 2018 (FAO, 2022).

A Geographical Rundown of Africa's Forestlands

The forestlands of West and Central Africa constitute the largest forest coverage in Africa. The West African woodlands and dry forests stretch along the Atlantic coast, nestle vastly across the southernmost fringes of the Sahara Desert, and fray into the Ethiopian highlands and coastal Red Sea of Northeast Africa (see Figure 1). Similarly, the subhumid forestland of West-Central Africa starts on the Guinean Atlantic coast, traverses four West African countries (Ivory Coast, Ghana, Nigeria, and Cameroon), and settles in the Central African Republic and northern region of the Democratic Republic of Congo (DRC) (Chirwa & Adeyemi, 2020).
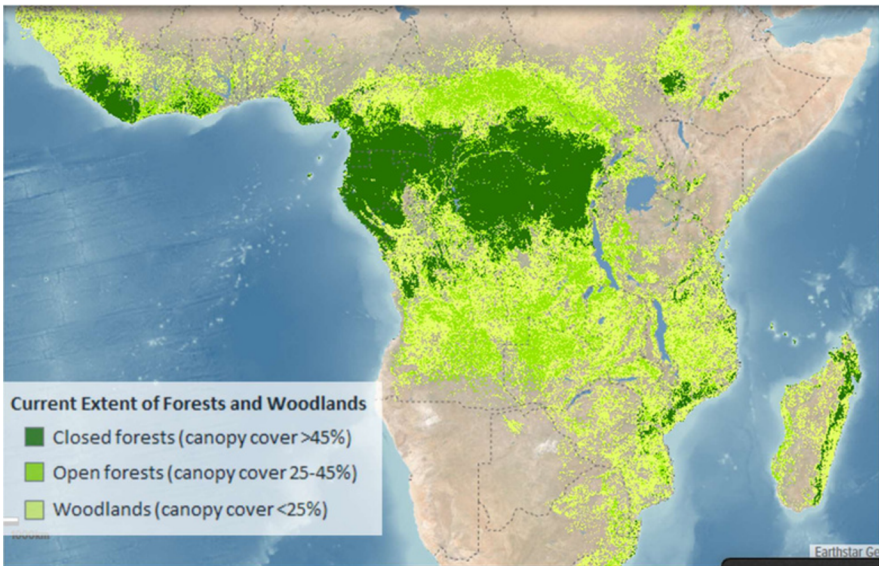
Figure 1. The current expanse of SSA's forests according to the Atlas of Forest Landscape Restoration Opportunities by the World Resources Institute (WRI, 2014).

A further extension of the subhumid forestland is the famous Congo Basin, an intact expanse that covers 1.4 million square kilometers (sq. km) spanning six countries. The total land mass occupied by the West-Central African tropical rainforest is approximately 2 million sq. km, making this the second-largest rainforest in the world after the Amazon

jungle (Malhi, 2018). It is home to variant tree species, including the 20-meter tall Parinari excelsa and the invasive human-planted Elaeias quineensis oil palm variety. The Congo Basin has been aptly called the "Lungs of Africa," a befitting moniker hailing its vast 70% contribution to ecological gaseous exchange among all forestlands in Africa (Nater, 2023).

Parallel to the Guinean dry forest is the northern mesic dry woodland, stretching over 2.6 million sq. km from the Senegalese Atlantic coast, through Mali, Ghana, and Nigeria, and into the south of Sudan and Ethiopia (see Figure 1). Human activity has disrupted this forested belt, leaving fragmented woodland, bush fallows, and wooded grasslands containing trees that rarely rise above five meters (see Figure 2). Scattered remnants of the baobab and Acacia trees are common in the mesic dry forestland. Finally, the East and Southern African forest zone is home to the Miombo woodland, which covers about 10% of the entire African land mass, the teak and Acacian woodlands, the Mopane woodland and shrubland, and the vastly degraded East African semiarid dry woodland comprising some 1.6 million sq. km of deciduous bushland dominated by the Commiphora and Acacia genus.
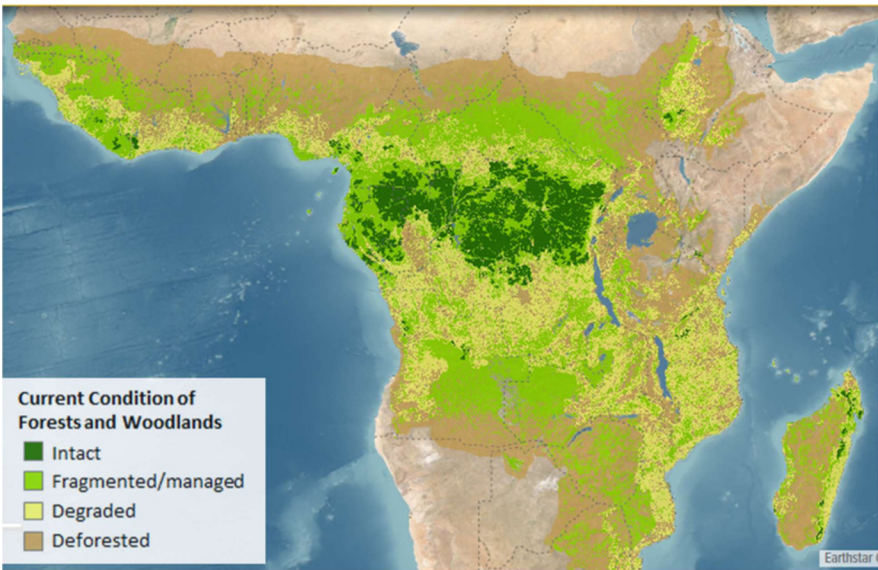

Figure 2. The current condition of SSA's forests and woodlands (WRI, 2014). The northern mesic dry woodlands (topmost green color) are mostly fragmented shrublands whereas the East and Southern African

forestlands are severely degraded. Only the dark green rainforest of the Congo Basin remains intact in the whole of SSA.

Tracing Africa's Deforestation Through History

Deforestation caused by variations in tropical land use has been a major contributor to anthropogenic climate change, carbon and greenhouse gas emissions, modified gaseous/water cycles, and biodiversity depletion. While Africa's tropical forests have not warranted exclusive attention in the global fight against environmental degradation, their exceptional diversity accounts for one of the largest terrestrial instruments for carbon sequestration. As such, SSA's forest cover contributes significantly to global carbon budgeting with sustainable feedback across the sub-Saharan climate system. Estimating the impact of forest clearance and land encroachment through human activity over time helps situate its impact on SSA's climate system. Current global biospheric trends rely on the accuracy of historical forest estimates for tropical deforestation (Aleman et al., 2018).

One of the earliest and perhaps most striking deforestation phenomena, dating back about 2,000 to 3,000 years, was the late Holocene rainforest crisis (LHRC). Evidence of extensive forest loss earmarked by the disappearance of a blanket of forest in the heart of West-Central Africa's rainforest raised numerous questions. Amid what was a relatively warm period caused by the glaring arid climates of the Holocene epoch, a vast area of forestland retreating into a pocket of isolated savanna backwoods sparked numerous debates about what caused it. Researchers obtained irrefutable evidence of the LHRC from sediments collected on the floor of Lake Barombi.

Nonetheless, justifying forest decline during the LHRC was complicated by the fact that a major Neolithic expansion was building southwards as farmers migrating from West African border regions entered West-Central Africa. Despite this contemporaneous human resettlement process, anthropogenic activity has not become a major influence on forest transformation. One hypothesis was that farmers were leveraging a naturally occurring forest denudation caused by the arid climate. The opposing view was that it was these farmers' activities that caused the forest loss. Recent studies have since established that

the LHRC was due to human disruption of the rainforest ecosystem as opposed to naturally occurring hydrological changes (Bayon et al., 2012; Garcin et al., 2018).

The early Iron Age incited a wave of human settlement in West Central Africa around 900 BC; however, after about 500 years of anthropogenic activity, there was a subsequent decline in human activity (Malhi, 2018). Forestlands in the Congo Basin recovered variably triggered by what is thought to have been a human epidemic, which wiped out most rural settlers. Another population decline happened around 100 A.D., resulting from despoilation and rural emigration triggered by colonial unrest during the transatlantic slave trade (Malhi, 2018). Today, most forestlands in the West Central region bear topological markers signaling intermittent periods of declined human activity. For instance, palaeo-data from Benin and Togolese forestlands reveal that there was a transitional phase circa 4,000 years ago caused by aridity. Most encouraging is how all cases of degraded forestland resulted in vegetational re-rotation even after long periods of severe anthropogenic deforestation.

The next most rampant period in deforestation across SSA was the twentieth century. Most estimates show that the 1900s were a period of astronomically high deforestation (Sodhi et al., 2010; Ter Steege et al., 2015). Anywhere between two-fifths and one-half of Africa's tropical rainforests were deforested during the twentieth century (Aleman et al., 2018). West Africa's forestlands account for 90% of this depletion, while East Africa lost at least 75% of its woodlands. Some of the worst affected countries underwent severe forest dilapidation in the 1900s. Ivory Coast's forestlands, the most affected of the West African states, reduced from 15 million hectares in 1900 to a mere 4.46 million hectares in 1980. These forests had remained virtually untouched until around 1880, and deforestation did not advance significantly until 1951. The total Ivorian forest cover had only reduced by 3 million hectares between 1900 and 1956 but plummeted by 8 million hectares less than 25 years after that (Fairhead & Leach, 2003).

Localized studies assessing geological forest maps have suggested that European timber traders sourced the bulk of their products from West and East African forests in the 1900s. Anthropogenic activities explain virtually all historical forest events in SSA dating back thousands of years. Since the last century, forestland has re-encroached over 135,000

sq. km of tropical African savannah (Aleman et al., 2018). Expansion of this nature may be indicative of colonial policies for the containment of wildfires, carbon sequestration favoring C3 tree growth over C4 savannah grasslands, vegetation regrowth in response to paleo-climatic variations, or a disruptive pattern of decreased seasonal rainfall during the Holocene crisis (Aleman et al., 2018). The twentieth century was fraught with war and conflict — this partly explains the atypical trend in the Congo Basin, where deforestation slowed down over the years. While these forestlands had been encroached prior to the European annexation, colonization concentrated settlers in open environments, thus reducing the effects of cultivation (Van Gemerden et al., 2003). Similarly, violent conflicts may have hindered the growth of infrastructure for industrial-scale deforestation and agriculture (Debroux et al., 2007).

Current Efforts to Address Deforestation: A Focus on Reforestation

The current global environmental lens holds the consensus that deforestation is fundamental to climate change and is a recurrent problem. However, there is no unanimous agreement as to the causes or solutions for deforestation. Proposed solutions have included regulation of commercial logging, tightening forest protection, increased reforestation efforts, and regulating anthropocentric activities causing deforestation. Landscape restoration movements are gaining positive momentum in SSA, with several initiatives working to address current deforestation issues and promote sustainable forest conservation.

Project: African Forest Landscape Restoration Initiative (AFR100)

Project Details

As perhaps the most prolific reforestation initiative in SSA, the AFR100 targets the restoration of 100 million hectares of forestland by 2030. The initiative's grants and loans funding scheme, dubbed TerraFund for AFR100, disburses donor funds to a cohort comprising the "Top 100" organizations within AFR100-sponsored countries across SSA.
Project Stakeholders/Targets

The initiative's latest round of funding, the second cohort, has allocated $17.8 million to 92 organizations spread across three SSA subregions: the Greater Rift Valley in Kenya, the Ghana Cocoa Belt, and the Lake Kivu and Rusizi River Basin, a cross-border catchment area shared by Burundi, the DRC, and Rwanda.

Financiers and Partners

Jeff Bezos funded the second cohort through the Bezos Earth Fund. Other financiers include the Audacious Project (founder of TED conferences) and the Bridgespan Group. Other sponsors of the initiative include the AKO Foundation, Caterpillar Foundation, DOEN Foundation, Good Energies Foundation, Lyda Hill Philanthropies, and Meta. TerraFund's managers are the World Resources Institute, One Tree Planted, Realize Impact, and Barka.

AFR100-Funded Sub-Projects

Some of the largest projects in the AFR100 cohort from each of the five countries are as follows:

Project: The Goshen Global Vision Project

Project Details

Goshen Global Vision (GGV) is a Ghanaian non-profit organization that has collaborated with AFR100 to establish financial associations across rural Ghanaian communities that empower farmers to conserve and restore landscapes. For over seven years, GGV has been involved in community-driven natural resource management by concerting its efforts towards expanding tree cover across Ghana's croplands and forestlands. To date, this organization has replanted over 220,000 trees across seven coastal districts and supported over 2,400 beneficiaries.
Project Goals

The project targets planting 275,000 trees across 8,096 hectares in West Ghana. GGV mobilizes farmers working in fields, mostly women and youth, to restore deforested land and forests depleted by agricultural encroachment. Powered by the AFR100 initiative, GGV will reforest the Subri Forest Reserve and interplant biodiverse native species across Ghana's westmost cocoa farms.

About 50% of GGV's beneficiaries are women, with about 1,300 junior and senior high school students in Ghana having awareness about environmental stewardship. Photo Credit: GGV, https://goglobalvision.org/about/

GGV Program Impact

GGV has partnered with the United States Forest Service International Program (USFS-IP) and is currently active in 72 communities across Ghana's Western Region (Werengo, n.d.). In conjunction with other organizations like the Forestry Commission of Ghana and the United States Department of Agriculture, GGV spearheaded the Greening Sekondi-Takoradi project in Ghana to spread awareness for greenery preservation and encourage replantation for recreational purposes. Stakeholders for this project have collectively planted 20,000 trees in deforested/degraded areas of Sekondi-Takoradi to restore balanced forest distribution and promote equitable access to green infrastructure (Borelli et al., 2023).

Project Approach and Outcomes

GGV's niche focus has been on disrupting the dormancy of indigenous tree species across cocoa communities by combining scientific knowledge on interplanting with rural knowledge for sustainable intercropping. Other important activities have included mangrove forest restoration projects, agroforestry across West Ghana's cocoa farms, loans and savings schemes for farmers, establishing restoration woodlots, and building Community Resources Management Areas (CREMAs) for biodiversity conservation across fringe communities.

The GGV AFR100 project. Photo Credit: AFR100,
https://www.africa.terramatch.org/landscapes

Joint Project: The Ebenezer Ministry International & Plant With Purpose

Project Details

The Plant With Purpose project in the DRC will empower over 10,000 farming families to practice sustainable land activities, including tree planting, along degraded watersheds.

Project Goals

Plant With Purpose has collaborated with Ebenezer Ministry International, a local affiliate in the DRC, to plant 300,000 trees across 810 acres in Uvira and Fizi, South Kivu. These trees are planted and protected by individual farmers on their land and in their local communities and forests. For over three-and-a-half decades, Plant With Purpose has steered rural community movements for reforestation and watershed replenishment projects.

Program Impact

Since its launch in 2015, the Plant With Purpose program in the DRC has resulted in the establishment of 7 watersheds and has empowered over 89,000 participants to plant over

4.3 million trees in DRC's forestlands. The collaborative project with Ebenezer Ministry International is one among 127 church partnerships in the DRC (Plant With Purpose, 2024). An impact evaluation conducted in 2017, two years after launching the DRC reforestation project, showed that poverty levels around the Kakumba watershed had reduced, with families becoming more food secure (Lazaro, 2024).

Other Related Projects

Plant With Purpose has directed several projects in SSA over the last decade, including a joint replantation project with Arbor Day Foundation targeting 260,000 trees across seven countries, a series of collaborative projects with Plant-for-the-Planet, including the Mutsindozi watershed project, and a reforestation project with Tentree targeting the planting of 10 trees for each Tentree product sold.

Plant With Purpose has intensified efforts for sustainable agroforestry systems by interplanting crops with trees to improve SSA's degraded croplands. Photo Credit: Plant With Purpose, https://plantwithpurpose.org/reforestation/

Joint Project: Joint Initiative between APRN/BEPB and 3C

RE: The Association Protection des Ressources Naturelles pour le Bien-Etre de la Population au Burundi (APRN/BEPB) & Association Conservation et Communauté de Changement (3C) Joint Project

Project Details

The joint initiative between APRN/BEPB and 3C advances environmental protection work in Bujumbura by growing trees to protect the Ntahangwa and Nyabagere watersheds from floods and degradation.

Project Outcomes

APRN/BEPB's objectives over the years have included educational awareness, risk reduction in the natural environment, informal youth awareness regarding environmental issues, training on natural resource management, local empowerment for active participation in biodiversity conservation, project execution for sustainable human- environment interaction, and regional and international cooperation for ecosystem protection.

The APRN/BEPB-3C collaborative replantation project. Photo Credit: AFR100,
https://www.africa.terramatch.org/landscapes

Project: Rwandaise Pour Le Développement Endogène (ARDE/KUBAHO)

Project Details

The AFR100, in conjunction with Rwanda's ARDE/KUBAHO, will replant 358,000 trees over a 1,500-hectare forestland.

Project Stakeholders/Targets

ARDE/KUBAHO sensitizes local farmers on agroforestry activities in Rubavu District, Rwanda.

The ARDE/KUBAHO and AFR100 collaborative tree replantation project. Photo Credit: AFR100, https://www.africa.terramatch.org/landscapes

Project Goals

The goal of this AFR100-funded project is to mobilize small-scale farmers to grow fruit, native tree species, and bamboo clumping to curb the effect of gullies. Alongside forest conservation, ARDE/KUBAHO provides Rwanda's underserved communities with access to clean water, school hygiene, and improved school completion rates by providing water, sanitation, and hygiene (WASH) solutions. The ARDE/KUBAHO project complements current efforts by the Rwanda Green Fund, which has done important work in reforesting, regenerating, and expanding forestland to promote tree species diversity and protect the natural environment in Rubavu and Nyabihu Districts. Forest regeneration and planting expansive tree varieties, especially fruit trees, helps prevent soil erosion and restore firewood supply among communities that depend on it.

Project: The Network for Natural Gums and Resins in Africa (NGARA)

Project Details

As one among hundreds of Kenyan initiatives dedicated to environmental conservation, NGARA is an AFR100 top cohort targeting the replantation of 700,000 trees across 500 hectares of forestland in SSA. NGARA focuses its conservation efforts on African producers of natural gum/resin to help them develop sustainable means for planting, harvesting, and marketing products.

Project Outcomes

Through the AFR100 initiative, NGARA will plant more Acacia senegal trees and aloe plants in the Kenyan counties of Elgeyo Marakwet, West Pokot, and Baringo. Specifically, NGARA's current project in Baringo County, called Bolstering Resilience and Livelihoods: Strengthening Non-Timber Forest Products in Baringo County, is being implemented in Tenges and Marigat wards with the aim of restoring forestland by replanting 700,000 trees. NGARA collaborates with AFR100 as part of its long-term environmental conservation project geared toward the fulfillment of the program's 2030 Framework of Priorities.

Project Stakeholders/Targets

With the support of FAO, the African Union Commission (AUC), and the Africa Forest Forum (AFF), NGARA has extended its operations to 16 countries and overseen the production of over ten kilotons of gums and resins.

NGARA's projects have comprised tree nurseries for aloe and other tree varieties for reforestation across all its target territories. Photo Credit: NGARA, https://ngara.org/wp-content/uploads/2024/BolsteringResilienceandLivelihoods-Baringo.pdf

Previous Work

Some of NGARA's notable projects include the Acacia Operation Project (AOP), a collaboration with FAO that led to the reforestation of about 13,000 hectares in six countries, and the Food for Assets project funded by the World Food Programme.

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Project: PANORAMA Restoration

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Project Details

The PANORAMA Restoration community program focuses on the restoration of tree-rich croplands and forest areas. The program pays close attention to regaining ecological balance by enhancing the human-nature relationship in SSA's deforested and degraded forestlands. In addition to tree planting, the PANORAMA project portfolio targets the restoration of degraded landscapes, improving SSA's climatic conditions, improving food security, and expanding SSA's life-supporting watersheds.

In concert with other initiatives like the AFR100 and the Bonn Challenge, the PANORAMA Restoration project continues to empower local practitioners to implement and scale up forest restoration efforts. Photo Credit: PANORAMA Restoration, https://panorama.solutions/en/portal/panorama-restoration

Financiers and Partners

The PANORAMA Restoration program is jointly funded by a network of partners including the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the International Union for

Conservation of Nature (IUCN), the United Nations Development Programme (UNDP), GRID-Arendal, United Nations Environment Programme (UNEP), Rare, EcoHealth Alliance, ICCROM, World Bank Group, OCTO Group, the International Council on Monuments and Sites (ICOMOS), and IFOAM. Collectively, over 1,000 partners form the backbone of the PANORAMA initiative, contributing a body of knowledge and innovative conservation solutions for sustainable change.

Project Stakeholders/Targets

PANORAMA's restoration project targets AFR100 host countries, which, in the current cohort, are five East and Central African countries.

Project: The Bonn Challenge

Project Details

The Bonn Challenge is a worldwide project that targeted the restoration of 150 million hectares of deforested/degraded forestland by 2020 and a total of 350 million hectares by 2030. As of 2024, there were 31 restoration pledges in Africa alone, contributing to a current global pool of just over 210 million hectares in pledged reforestation acreage. Of these, over 110 million hectares, or just over half of the total pledged acreage, were within SSA. The Bonn Challenge megaproject launched in 2011 and achieved its 150-million-hectare milestone only six years later, in 2017.

Project Approach and Outcomes

The Bonn Challenge adopts a nuanced reforestation methodology called forest landscape restoration (FLR). The FLR approach helps restore ecological balance while promoting the well-being of those dependent on forest resources for their livelihood.

Avocado trees are an essential part of Madagascar's forest restoration efforts. Upon replantation from the nurseries, these seedlings become part of a nationwide initiative to repopulate Madagascar's forestlands with 60 million trees by 2025. Photo Credit: The Duke Lemur Center, https://lemur.duke.edu/restoring- forests/

Financiers and Partners

The Bonn Challenge was the brainchild of the German government through the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety, and Consumer Protection, in conjunction with the Norwegian government through the Ministry of Climate and Environment and the Global Environment Facility (GEF) investment fund. Key sponsors and facilitators include IUCN, UNDP, GIZ, and UNEP.

Project Stakeholders/Targets

At present, there is a global total of 83 pledges from over 60 countries responding to the project's overall goal to address land degradation, offer relief to 3+ billion people, and restore about a third of the world's arable croplands. The project targets countries, organizations within and external to states, and private actors who can help meet the program's ambitious targets.

Project: Regreening Africa

Project Details

Regreening Africa is a five-year, multi-country, research-in-development project launched in 2017 with the goal of improving livelihoods, building resilience to climate change, and increasing food security through agroforestry. The project targets 500,000 households in SSA with the aim of increasing their household income by 10%. The project also targets the sustainable management, through agroforestry, of 1 million hectares of cropland, a 5% decrease in soil erosion, and a 10% increase in tree cover in each of eight target countries: Kenya, Ethiopia, Somalia, Rwanda, Ghana, Mali, Niger, and Senegal.

Project Impact

In Ethiopia, the project targets four regional states—Peoples' Region (SNNPR), Oromia, Southern Nations Nationalities, and Tigray—to improve the lives of 120,000 farming families and restore over 200,000 hectares of degraded landscapes. In Kenya, the project targets 150,000 hectares and 50,000 farming households in the counties of Migori, Homa Bay, Nakuru, Elgeyo Marakwet, Baringo, Isiolo, Laikipia, Marsabit, and Samburu, in partnership with World Vision Kenya, ICRAF, and the national/county government. In Somalia, the project will restore 12,890 hectares of arid land and support 19,857 households in Dweyne, Awdac, Sanaag, Karkar, and Bari districts in partnership with World Vision Somalia, ICRAF, and CARE Somalia. In Rwanda, the project targets 100,000 hectares and 70,000 households across four Eastern Savanna districts in collaboration with World Vision Rwanda and ICRAF Rwanda. In Mali, the project targets 160,000 hectares and 80,000 farming households in Koutiala, Yorosso, Tominian, and San, in partnership with Oxfam Mali, Sahel Eco, World Vision, Catholic Relief Services, and ICRAF Sahel. In Niger, Regreening Africa continues its land restoration efforts targeting 90,000 hectares across Maradi and Zinder to expand the already restored 5 million hectares of cropland and forestland. The official in-country partner is World Vision Niger. In Senegal, Regreening Africa will restore 160,000 hectares and support

80,000 farming households in the Kaffrine, Kaolack, and Fatick regions in partnership with World Vision Senegal and ICRAF Sahel. In Ghana, the project targets 90,000 hectares of forestland and 40,000 farming households in the districts of Bawku West, Garu Tempane, and Mion. In-country collaborating partners included World Vision Ghana, Catholic Relief Services, ICRAF Sahel, government agencies, and local communities.

Regreening Africa has empowered the Chongoo Women's Nursery Group to further its reforestation efforts in Elgeyo-Marakwet County, Kenya. Photo Credit: Regreening Africa, https://regreeningafrica.org/regreening- heroes/

Financiers and Partners

The European Union funds Regreening Africa and has partnered with international NGOs to steer in-country implementation. These partners include CIFOR-ICRAF, which helped launch the project, World Vision, Catholic Relief Services, CARE International, OXFAM, Sahel Eco, and the Global EverGreening Alliance.

Project: WeForest

Project Details

Since 2009, WeForest has spearheaded extensive project work across East, West, and Southern Africa. The Great Green Wall program of East/West Africa comprises three projects in Ethiopia. In comparison, the Miombo Belt Regeneration Program of Southern Africa includes six active projects in Zambia and Malawi, and the Blue Carbon Program in West Africa consists of two active projects in Senegal. These projects continue to maximize the impact of trees on people and the ecosystem, driven by the vision of founders Bill Liao and Marie-Noelle Keijzer. Current projects include the Desa'a Forest restoration project targeting one of Ethiopia's oldest dry Afromontane ecosystems, the Gewocha Forest and Wof Washa Forest restoration projects, both also in Ethiopia, and the Ferlo zone restoration project in Senegal.
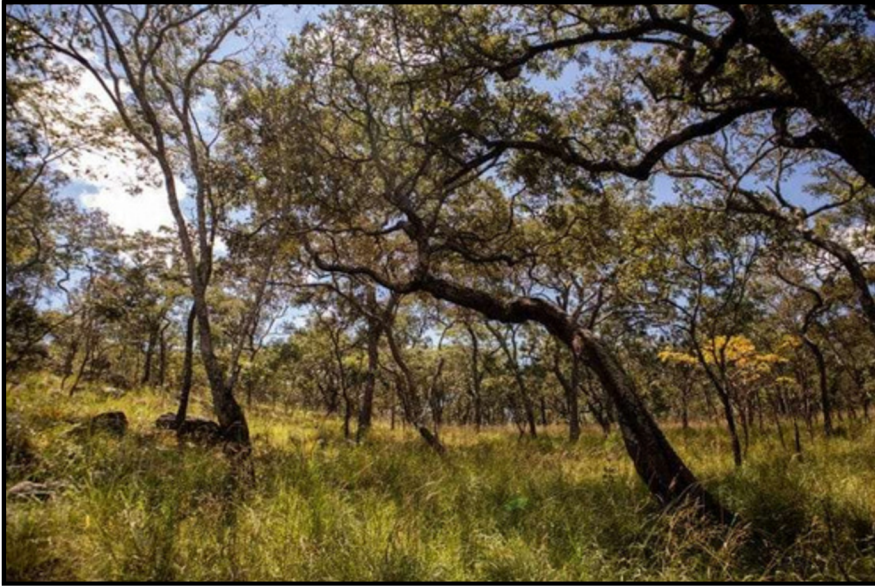
The Katanino Forest restoration project in Zambia is one of WeForest's reforestation efforts in the Miombo Belt Regeneration Program of Southern Africa. Photo Credit: WeForest, https://www.weforest.org/blog/weforest-in-the-media/conservationists-assist-a-forest-reserve-in-zambia-to-regrow-itself/

Project Goals

Each project in the WeForest portfolio has defined goals. For instance, The Ferlo zone project under the Great Green Wall program aims to regreen 10,000 hectares through local community work. The project will also plant 15 native tree species to boost non-timber income and fodder availability during the arid season. The first phase of the project, currently underway, will oversee the restoration of 1,000 hectares of forestland. Similarly, the Gewocha Forest project will restore over 7,900 hectares of forestland, rehabilitate over 1,100 hectares of degraded communal land, and introduce agroforestry across 925 hectares of smallholder farmland.

Project Impact

So far, the Great Green Wall program has regreened 21,679 hectares with over 21.9 million trees accounting for 183 different species. In comparison, the Miombo Belt Regeneration Program has replanted over 33,000 hectares with over 36.3 million trees for the benefit of more than 12,700 families. For the Blue Carbon Program, over 7,700 hectares are under restoration, housing 21.8 million trees.

Financiers and Partners

WeForest Ethiopia has partnered with Tigray Plan and Finance, EFCCC, Mekelle University, TBOARD, EEFRI, and the Hunger Project. In Senegal, the official partners are Agronomes et Vétérinaires Sans Frontière (AVSF), Eclosio, ISRA, CIRAD, Oceanium, and Pôle Pastoralisme zone sèche (PPZS). Similarly, WeForest Zambia has partnered with BeeSweet, LFCA, Rainlands Timber, and DFCA, while WeForest Malawi works with the Forest Department and Cedar Energy.

Best-Practice Recommendations

Forestland and cropland management for better tree survival rates: The short-term survival rate for planted trees is favorable for most reforestation projects across SSA; for instance, Plant With Purpose reported a 60% survival rate over three years of monitoring (Plant With Purpose, 2022), while PANORAMA Restoration cites a 98% survival rate for its agroforestry projects (PANORAMA, n.d.). Higher survival rates for SSA's restoration projects are a determinant factor for affordable reforestation across local communities (CIFOR- ICRAF, n.d.). More projects have focused attention on agroforestry, cropland management, farming-driven activities such as weed and pastoral control, and improved roadway access to reforested areas. These activities collectively improve the survival rate for trees in reforested areas. Le et al. (2013) have established a statistically significant influence of cropland activities and road conditions on tree survival rates. The chances of a reforestation project having a high tree survival rate (over 80%) improve up to twenty-fold with cropland and forestland management strategies such as grazing management, weed/pest control, and improved road access.

Progress monitoring to diagnose project health: Most project facilitators conduct short- and long-term progress monitoring for reforestation projects. Progress monitoring allows programs to meet their objectives, identify issues and challenges impeding progress, detect when reforestation efforts are ineffective or need improvement, and notice the early signs of project success or failure (AFR100, n.d.). As witnessed across most restoration projects in SSA, it is not enough to only monitor land coverage and the number of trees planted in reforested areas. Instead, facilitators should consider other critical progress indicators such as carbon sequestration outcomes, ecological succession patterns, species diversity, and the economic benefits realized at the community level.

Diverse tree varieties to interweave ecological benefits: The potential benefits of emphasizing genetic species variations are numerous, including effective product provision and ecosystem balance, higher resource production, greater wood yields, and improved soil protection. These benefits may explain the rising preference for agroforestry systems and interplanting activities as a central agenda for many of SSA's reforestation projects.

Tree-based innovations to repair ecosystems and ameliorate climate change effects: Current market trends continue to offer a wide variety of tree-based technologies ranging from tropical fruits to agroforestry systems. For instance, Faidherbia albida is an indigenous variety of nitrogen-fixing trees exhibiting a unique leaf abscission pattern whereby leaves are shed in advance of crop growth. Therefore, this tree species will not compete with crops for light and will nourish the soil with leaf litter. Leaf litter from one hectare of F. albida trees will inject over 100 kg of nitrogen into the soil (Program on Forests [PROFOR], 2011). Similarly, cocoa agroforestry promotes sustainable reforestation by extending the replantation lifecycle of cocoa trees from a maximum of 20 years to as much as 60 years.

Sustainable woodfuel plantation: As tighter regulations address deforestation in the woodlands, the gap widens between woodfuel supply and demand. Resultantly, private actors have resorted to interplanting trees with other commercial plantations using woodlots and croplands. To this end, a balance prevails as natural forests remain uncleared for plantation and woodlots continue to thrive under responsible management. Contrary to the myth that woodfuel cannot be produced sustainably, SSA projects have introduced

strategies such as assisted natural regeneration, agroforestry systems, and invasive tree species to mitigate environmental degradation. For instance, CIFOR and World Agroforestry have tested the use of invasive P. juliflora species to produce charcoal sustainably in Kenya and reduced mangrove wood consumption in Cameroon (Mollins, 2020).

Policy reorientation towards decentralizing restoration efforts: Devolving cropland and forestland restoration efforts to local communities and organizations has become a key requirement for shaping the outcomes of natural resource management in SSA. While decentralizing reforestation is not a failsafe guarantee for success in restoration, localized control improves the chances of better resource management. The challenge, therefore, becomes one of empowering and legitimizing local management organization efforts with the goal of ensuring that local projects can implement effective management mechanisms. Legitimization also shields local organizations from falling victim to elite capture.

Cross-sector rural development efforts to encourage synergy: Increasing investment in trees/landscape restoration meaningfully would require partner-led initiatives to go beyond targeting the forest sector solely. Instead, engagement with a wider range of stakeholders in other sectors, such as lands, water, energy, livestock, agriculture, and environmental finance, would bolster reforestation outcomes. Further, restoration efforts should target socioeconomic drivers such as civil societies, food companies, business associations, and private investors. Public authorities, producer associations, and private sector players such as exporters and processors play a significant role in offering project monitoring capabilities. Expectedly, these roles will continue to evolve as forestlands and the communities surrounding them become more market-oriented.

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