

Regreening Africa: A bottom-up transformation of degraded lands

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This article was submitted for inclusion in the forthcoming edition of ETRN News 60 - Restoring African drylands, due for release in December 2020



“Restoration interventions are as much about people, as they are about changing environments.”

Introduction

It is estimated that 20% of global land is either degraded or undergoing degradation, leading to an annual loss of 12 million hectares of productive land (UNCCD 2017). In Africa, some 715 million ha are degraded, including 65% of all arable land, 30% of all grazing land and 20% of all forests. This is due to increasing populations, poor land management, institutional challenges and climate change (Gnacadjia and Wiese 2016). The benefits of taking action against land degradation outweigh the costs by up to seven times, implying that inaction will cost countries US\$ 490 billion per year, while action to reverse land degradation could generate benefits worth up to US\$ 1.4 trillion (ELD Initiative 2015).

Several global initiatives address the threat of land degradation, notably the Bonn Challenge and the New York Declaration on Forests. The UN also declared 2021–30 the “decade on ecosystem restoration,” signalling a strong political commitment to restoration for achieving the Sustainable Development Goals. In Africa, there are also the regional AFR100 and Great Green Wall initiatives and a growing number of bilateral projects.

Regreening Africa is a five-year programme (2017–22) funded by the EU that aims to restore one million hectares and contribute to the livelihoods of 500,000 smallholder farmers across eight African countries; Ethiopia, Ghana, Kenya, Mali, Niger, Rwanda, Senegal and Somalia. It addresses key aspects of land degradation in agricultural lands, such as soil erosion and declining soil fertility, low agricultural productivity, overgrazing and deforestation. It also supports the development of tree-based value chains.

The approach

Many restoration initiatives are characterized by a top-down approach, aggressively promoting one technology or practice as a “silver bullet.” But such a focus cannot possibly address the complexity of restoring site-specific ecosystem functions and increasing agroecosystem resilience. That approach also fails to incorporate farmer needs, knowledge and values. Various restoration components do serve specific purposes (erosion control, carbon sequestration, etc.; see Bastin et al. 2019), but care must be taken when using them, such as ensuring that plantations do not replace indigenous species, or that tree planting incentives do not lead to the clearing of natural forests (Holl and Brancalion 2020).

The Regreening Africa programme is valuable in three main ways.

- It integrates cost-effective, farmer-led, gender-responsive restoration options such as farmer managed natural regeneration (FMNR); tree growing; tree-based value chain development; and soil and water conservation practices to enhance agricultural productivity and diversity at the farm level.
- Restoration practices are delivered through scalable models such as the use of lead farmers; farmer-to-farmer training; radio talks/shows in the local languages; use of community videos; establishment of FMNR model sites, rural resource centres and community tree nurseries; exchange programs and site visits; policy influence with community advocacy and action groups; and strengthening of grassroots institutions (mainly Village Savings and Loan Associations).
- It uses an adaptive management approach that integrates World Agroforestry’s (ICRAF) research expertise, learning and evidence from farmers in the fields and the longstanding experience of international development

NGOs to enhance performance. Additional research generated by the Economics of Land Degradation (ELD) Initiative also informs the programme.

Oxfam, Catholic Relief Services and Sahel Eco. Each of these groups has established networks of national and grassroots influencers such as line government ministries, extension agents, traditional chiefs, lead farmers, rural advisory services and community-based organizations.

ICRAF leads a consortium of international NGOs that comprises World Vision, CARE International,

Table 1. Technical challenges, strategies, successes and gaps covered by the Regreening Africa project

Restoration challenges	Key strategies	Activities	Gaps to be addressed
<ul style="list-style-type: none"> Restoration knowledge, evidence and learning Capacity in FMNR, tree planting, soil and water conservation 	<ul style="list-style-type: none"> Improving access to knowledge and skills Customising and translating guides and manuals to local languages In-situ grafting to enhance farmer participation 	<ul style="list-style-type: none"> Farmer-to-farmer or organization-to-organization sharing and learning FMNR training-of-trainer events Tree nursery training Refinement and preparation of technical guides, leaflets and targeted information materials for farmers and extension agents 	<ul style="list-style-type: none"> Implementors' capacity "Restoration" meaning different things to different actors Time lag to benefits Incentives for lead farmers
<ul style="list-style-type: none"> Poor-quality tree seed Limited diversity for enrichment planting Invasive species 	<ul style="list-style-type: none"> High-quality, diverse tree seed and sourcing advice Seed orchards established Inventory of existing species and prioritization Seed collection and storage guides 	<ul style="list-style-type: none"> Timely sourcing and distribution of planting material Contracting nursery producers Seed and nursery guidelines Follow up and technical support for seedling management 	<ul style="list-style-type: none"> Limited resources for local seed sources, establishment and maintenance
<ul style="list-style-type: none"> Low or no investment in rural delivery infrastructure 	<ul style="list-style-type: none"> Support to farmer organizations, co-ops, CBOs, etc. 	<ul style="list-style-type: none"> Support for technical services Establishing rural resource centres 	<ul style="list-style-type: none"> Resource constraints in local governments to scale advisory services to all farmers
<ul style="list-style-type: none"> Value chain development 	<ul style="list-style-type: none"> Timber and non-timber value chains scoping assessments 	<ul style="list-style-type: none"> At least 24 priority value chain options identified for short-, medium- and long-term investment 	<ul style="list-style-type: none"> Access to finance to reduce the risks for private-sector investments Low volumes and little aggregation Poor infrastructure
<ul style="list-style-type: none"> Spatial assessment of land health and vegetation cover 	<ul style="list-style-type: none"> Systematic and crowdsourced monitoring 	<ul style="list-style-type: none"> Spatial analysis of land health indicators Making site maps available A free mobile app to collect data on tree nurseries, tree planting and FMNR Collecting crowdsourced information to track real-time progress in intervention areas Co-designed decision processes to engage partners in evidence-based decision making 	

cont. table 1

Restoration challenges	Key strategies	Activities	Gaps to be addressed
<ul style="list-style-type: none"> Measurement of household data and socioeconomic outcomes 	<ul style="list-style-type: none"> Tracking adoption rates of various restoration practices Measurement of socioeconomic outcomes 	<ul style="list-style-type: none"> Gender-sensitive, multi-dimensional “regreening action index” developed to measure the extent of engagement in restoration Annual uptake surveys to measure the adoption rates of promoted technologies 	
<ul style="list-style-type: none"> Policy shifts needed to accelerate land restoration 	<ul style="list-style-type: none"> Adopting the SHARED approach to structured stakeholder engagement Mapping outcomes to track behavioural changes 	<ul style="list-style-type: none"> Stakeholders identified for engagement through mapping and social network analysis Policy gaps identified (Bernard et al. 2019) Outcome mapping used to identify and track progress towards a more conducive enabling environment for scaling restoration 	<ul style="list-style-type: none"> Policy challenges in land and tree tenure take time to overcome

Monitoring land restoration

Because of the wide differences among degraded sites, the land health status of each site was assessed. This established a baseline from which to track changes and better match restoration practices to local processes and drivers of degradation. Soil organic carbon and soil erosion were assessed using the global network of the

World Agroforestry Network’s Land Degradation Surveillance Framework, and changes in vegetation were assessed using Earth Observation data and field surveys. Data shows that sites in Ethiopia, Ghana, Mali, Niger and Senegal with less vegetation (less than 55% cover) also have low soil organic carbon (less than 13 gC kg⁻¹, or 1.3%) and a high prevalence of soil erosion (more than 65%).

Table 2: Vegetation cover, soil organic carbon and erosion prevalence across regreening sites in seven countries

Country	Mean fractional vegetation cover (%)	Mean soil organic carbon (gC kg ⁻¹)	Mean soil erosion prevalence (%)
Kenya	63	24.8	53
Rwanda	63	20.8	49
Ethiopia	54	12.3	66
Ghana	44	7.3	65
Mali	26	5.4	73
Senegal	11	3.4	68
Niger	3	2.2	84

By combining biophysical and socioeconomic assessments (including community consultations and local expert knowledge), the programme is developing combinations of restoration options that are appropriate to local contexts. Project learning and evidence have helped refine and diversify the recommended options, including FMNR and enrichment planting with multipurpose timber and non-timber trees; soil and water

conservation with agroforestry trees and grasses (contour bunding, sand dune stabilization, half-moon catchments and *zai* pits); exclosures; in-situ grafting and direct sowing; and fire management. See Table 3. Some of these apply across countries and sites; others, such as exclosures in Ethiopia, are country-specific.

Regreening Africa also uses radio programmes and engages with local governments to scale out to areas beyond the project sites. A total of 9,200 polygons have been mapped using the

Regreening Africa app, which enables real-time monitoring of changes in vegetation cover, soil organic carbon and soil erosion.

Table 3: Examples of restoration options evaluated across 8 countries and 23 sites

Restoration options	Ethiopia	Ghana	Kenya	Mali	Niger	Rwanda	Senegal	Somalia
	Oromia, Tigray, Amhara, SNNPR	Bawku, West, Garu-Tempane Mion	Migori, Homa Bay	Tominian, Yorosso, Koutiala, San	Simiri, Ouallam, Hamdallaye	Gatsibo, Kayonza, Nyagatare, Bugesera	Kaffrine, Fatick, Kaolack	Baki, Togdheer, Baari, Sanaag
Tree planting, direct sowing, in-situ grafting	✓	✓	✓	✓	✓	✓	✓	✓
Developing a tree-based value chain	✓	✓	✓	✓	✓	✓	✓	✓
Farmer managed natural regeneration	✓	✓	✓	✓	✓		✓	✓
Soil and water conservation	✓			✓	✓	✓		✓
Fire management		✓		✓				
Wood lot establishment	✓		✓			✓		
Boundary tree planting and silvopasture						✓		
Pasture reseeding			✓					

Influencing policy to accelerate adoption and scaling

Effective policies and institutions are critical for adopting and scaling up land restoration, since barriers often exist within policy and institutional frameworks. In many project countries, land restoration policies and development work are poorly aligned and coordinated, and efforts in one sector undermine those in another. Unclear legislation related to land and tree tenure also have a negative impact on investment in forestry and agroforestry, and – more crucially – on the inclusion of women in restoration efforts. Additional barriers identified by stakeholders (including farmers) are inadequate markets and incentives,

poor governance and the breakdown of traditional systems, lack of knowledge, limited policy implementation, open grazing, poor communal land management and limited local capacity.

A review of policies showed that agroforestry was mentioned in almost all countries, but only half had specific agroforestry strategies or policies (either finalized or under development). Policies pertaining to tree tenure were also absent in many countries, particularly in the Sahel, but also in Ethiopia. The agriculture or environment sectors generally coordinate agroforestry efforts, but mechanisms to bring in other sectors and stakeholders were largely absent.



Farmers collecting firewood from an FMNR field in Ghana. Photo: Jason Amoo

Using a structured stakeholder engagement approach (called SHARED), steps were taken to enhance wider shifts in practice and policy. When the programme began, important stakeholders from the local, sub-national and national levels were invited to SHARED national workshops in each country, where they discussed successes, policy gaps and opportunities to support scaling. These culminated in the development of roadmaps to support the scaling of greening practices that participants were committed to. Together, these initiatives led to the identification of the greatest barriers to scaling restoration, to be influenced through policy dialogues. Outcome mapping is used to track progress towards shifting behaviour and actions in targeted organizations and to achieving policy shifts to create an enabling environment.

Benefits from land restoration

Restoration interventions are more about people than they are about changing environments. Helping communities and farmers become better organized is a lever for transformational change. Such engagements help ensure that rural communities can prosper on their own terms, adapting and responding to changes in and challenges

to maintaining land health and biodiversity resources. Restoration plans and practices that integrate trees and shrubs into agricultural and livestock production increase the amount and diversity of crops, forage, timber and non-timber products, and help maintain and regulate critical ecosystem services such as moderating microclimates, nutrient cycling, flood regulation, pollination and pest management.

At the household level, farmers have started reaping benefits from FMNR, such as firewood from tree pruning and thinning; fodder from grasses, shrubs and pruned trees; timber; poles; fruits and nuts; medicines and green manure. More benefits are expected as better-quality trees grow and bear better-yielding products. In addition, landscape-level benefits — such as the revitalization of ecosystem services through erosion control and enhanced vegetation cover — are being realized, especially from FMNR and from areas restored using half-moons in Niger and stone bunds in Mali.

Financing land restoration

Initiatives need public, private and blended finance to take place at a large scale. Restoration

costs vary depending on how it is done, and who does it and where. For example, FMNR and assisted natural regeneration are cost effective in restoring drylands, but the costs of raising seedlings, site preparation, planting and tending are very high, and survival rates tend to be low.

Public funding or grants need to balance project-related costs so that these are not consumed by field operations, and to ensure that such initiatives invest more than 60% in restoration activities. There is also a need for a greater understanding of the motivations and business needs of the private sector, and for appropriate engagement strategies, since there is a growing portfolio of green funding for restoration. Whether public or private, funding must ensure that strong social safeguards are in place to protect local communities from exploitation by existing political and economic power dynamics.

In blended finance models, public finance is crucial for the initial stages (where processes of multi-stakeholder engagement are built); private-sector finance can then link the products of restoration to markets. In the Regreening Africa programme, private-sector partnerships are explored to strengthen the value chains of high-value tree-based products such as shea, baobab, moringa, parkia (nééré), jujube, balanites, cashew, gum Arabic, frankincense, mango, avocado and papaya, which can generate economic returns for farmers.

Local community investments in terms of time and labour tend to be undervalued. Restoration processes involving FMNR are seen as “low cost” when these costs are not included in budgets.

Another key limitation of current funding models is their short-term nature (three to five years) and the fact that funding comes to an end before the full benefits are realized. Also, overseas development assistance is declining, and other models of finance are necessary.

Key achievements

Data from the programme’s uptake surveys in 2019 and in 2020 (ongoing), alongside real-time monitoring using the Regreening Africa app,

show that a diversity of land restoration practices are being taken up. FMNR is the most commonly adopted practice (Niger 94% uptake, Kenya 82%, Mali 74%, Ghana 62%, Rwanda 48%), followed by tree planting (Rwanda 82% uptake, Kenya 63%, Ghana 59%, Mali 54%, Niger 47%). In Kenya, the farmer-to-farmer upscaling model, where lead farmers train other farmers, is effective in enabling the widespread adoption of various technologies. More than 60% of households have already adopted different practices, and 3,044 ha are being restored. In Rwanda, the high number of households practising tree planting was due to the widespread availability of seedlings from the Rwandan government and local cooperatives, with 88% of households adopting various kinds of restoration practices and 4,784 ha under restoration. Based on survey findings, the project team is reviewing the approaches to scaling to better address existing barriers. The goal is to catalyse behavioural change so that more households will adopt land restoration and to promote learning within project sites.

Conclusions

To guarantee successful and sustainable land restoration and sustainable development, it is important to recognize farmers’ roles, and to co-design approaches that take their concerns into consideration, especially their time and labour.

By promoting and adopting bottom-up approaches, it is possible to see land restoration successes from the farmers’ perspectives.

Advocating for more favourable policies on issues such as land and tree access and tenure within national and sub-national governments is likely to accelerate the adoption of land restoration practices.

Land restoration requires more investment for higher impacts at scale.

Acknowledgements

The authors acknowledge the contributions of all project stakeholders and implementing partners, and inputs from Constance Neely, May Muthuri and Winnie Achieng (ICRAF) are appreciated.

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This article was submitted for inclusion in the forthcoming edition of ETFRN News 60 - Restoring African drylands, due for release in December 2020, containing 25 articles plus interviews and boxes describing farmer-led, NGO, private sector, government and international initiatives. These highlight the roles of varied policies and stakeholder interests, and identify opportunities to encourage smallholder and community participation in scaling out successes and meeting national, regional and global commitments.

This article may undergo further editing prior to publication of the complete edition, and as such, could differ from the version presented here.

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Issue date: October, 2020

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Cover photo: A member of Awash Bishola women's group in Ethiopia potting *Grevillea robusta* seedlings.
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