Forest Landscape Restoration Knowledge Document

Lessons Learned, Innovations and Implementation Insights From AREECA

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IKI INTERNATIONAL CLIMATE INITIATIVE

AREECA

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Alliance for Restoration of Forest Ecosystems in Africa (AREECA) | Internationale Klimaschutzinitiative (IKI)

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Foreword

Land degradation continues to undermine Africa's ecological foundations and the livelihoods of millions of people. Restoring ecosystems is no longer an option; it is a necessity for food security, climate resilience, and sustainable development. Against this backdrop, the Alliance for Restoration of Forest Ecosystems in Africa (AREECA) was established as a collective effort to demonstrate how restoration can work at scale.

This Knowledge Document presents the lessons and insights emerging from AREECA's implementation in Cameroon, Kenya, Malawi, and Rwanda. It reflects the combined contributions of governments, local communities, civil society, research institutions, and development partners. The results underline a key message: restoration succeeds when technical solutions are embedded in strong governance frameworks and linked to tangible social and economic benefits.

The experiences documented here highlight that FLR is more than planting trees. It is about rebuilding the functionality of landscapes, reconnecting people with ecosystems, and creating institutions that can sustain change over time. AREECA shows that restoration can generate multiple benefits like higher agricultural productivity, improved water security, enhanced biodiversity, and strengthened community cohesion, when interventions are adapted to local realities.

We hope that the lessons captured in this document will inspire further action and collaboration. By sharing both successes and challenges, AREECA contributes not only to its participating countries but also to the wider regional and global restoration agenda. The next step is to further scale these approaches, ensuring that restoration delivers lasting impact for people and nature.

Acknowledgements

At the heart of the AREECA programme are the communities, farmers, and local stakeholders who have actively engaged in restoration activities. Their knowledge, commitment, and tireless efforts on the ground are the foundation of all achievements documented here. This Knowledge Document is foremost a reflection of their work, insights, and dedication. Without their participation, none of the programme's successes would have been possible.

We are deeply grateful to the national and district-level government offices, including forestry, agriculture, and environmental authorities, whose guidance, coordination, and support enabled restoration initiatives to be implemented effectively and sustainably.

We also extend sincere thanks to the entire AREECA consortium staff, both at headquarters and in country offices, for their strategic leadership, technical expertise, and continuous commitment to the programme. Special recognition goes to the implementation teams working directly on the ground, whose daily dedication turned project objectives into tangible results.

We acknowledge the co-authors of this Knowledge Document for their thoughtful contributions, rigorous analysis, and collaborative spirit, which have greatly enhanced the quality and clarity of the report.

Finally, we recognize the International Climate Initiative (IKI / BMUKN) and all partner institutions for providing the vision, resources, and framework that made the AREECA programme possible.

While many have contributed in different ways, it is the communities and farmers - the true custodians of restored landscapes - who remain at the very heart of this work and to whom this document is dedicated.

Executive Summary

The Alliance for Restoration of Ecosystems in Africa (AREECA) demonstrates that large-scale Forest Landscape Restoration (FLR) is both feasible and impactful when ecological, social, and institutional dimensions are addressed together. Implemented across Cameroon, Kenya, Malawi, and Rwanda, the programme tackled diverse drivers of degradation, including shifting cultivation, overgrazing, deforestation, and erosion on steep slopes. By aligning technical interventions with governance reform and livelihood benefits, AREECA provides a blueprint for restoration that is both locally grounded and globally relevant.

On the technical side, AREECA piloted a portfolio of restoration measures. Terracing and soil conservation structures on steep slopes, community woodlots for biomass supply, riparian buffers for water protection, and rangeland reseeding were combined with innovative approaches such as Assisted Natural Regeneration (ANR) and area closures. Results show that ecological recovery is most durable when restoration is directly linked to household and community benefits, for example, improved crop yields in Rwanda, enhanced water security in Kenya, positive radiative effects around the sacred forests in Cameroon, and diversified income opportunities in Malawi.

Equally important were governance innovations. AREECA supported co-management of forest blocks in Malawi, recognition of sacred forests in Cameroon, and integration of restoration into district development plans in Rwanda. In Kenya, the creation of water funds linked upstream restoration with downstream financing from utilities. These cases highlight that restoration cannot be achieved through technical measures alone; it requires inclusive governance structures and clear legal mandates.

Social inclusion was another defining feature. Women and youth were not only beneficiaries but also decision-makers, supported through financial instruments such as Rwanda's Community Environmental Conservation Fund (CECF). Linking restoration to microfinance, small enterprises, and employment opportunities helped ensure broad participation and ownership.

AREECA also invested in sustainability beyond project cycles (e.g. the future and legacy process). Exit strategies focused on community funds, co-management agreements, and policy integration. Financing schemes such as PES created long-term incentives for stewardship.

Taken together, AREECA contributes directly to global initiatives such as the Bonn Challenge and AFR100 by moving from political commitments to measurable outcomes. Its tested approaches and lessons learned provide valuable guidance for scaling FLR across Africa and beyond.

List of Abbreviations

AFR100	African Forest Landscape Restoration Initiative
ANR	Assisted Natural Regeneration
AREECA	Alliance for Restoration of Ecosystems in Africa
AURORA	Assessment, Understanding and Reporting of Restoration Actions
AUDA	African Union Development Agency
BMUKN	Bundesministerium für Umwelt, Klimaschutz, Naturschutz und nukleare Sicherheit (Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety)
CECF	Community Environmental Conservation Fund
ECOWAS	Economic Community of West African States
EX ACT	Ex ante Carbon Tool
FFS	Farmer Field School
FAO	Food and Agriculture Organization of the United Nations
FOLAREP	Forest and Landscape Restoration Implementation Plan
FLR	Forest Landscape Restoration
FSC	Forest Stewardship Council
GCF	Green Climate Fund
GEF	Global Environment Facility
GIZ	Gesellschaft für Internationale Zusammenarbeit
GPS	Global Positioning System
GHG	Greenhouse Gas
IKI	International Climate Initiative
IPPM	Integrated Pest and Pathogen Management
IUCN	International Union for Conservation of Nature

LMA	Landscape Monitoring Accelerator
M & E	Monitoring and Evaluation
MoU	Memorandum of Understanding
NbS	Nature-based Solution
NDC	Nationally Determined Contributions
NEMA	National Environment Management Authority
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NTFP	Non-Timber Forest Product
PES	Payment for Ecosystem Services
PMU	Project Management Unit
PRA	Participatory Rural Appraisal
PNV	Potential Natural Vegetation
ROAM	Restoration Opportunities Assessment Methodology
SIA	Social Impact Analysis
SWC	Soil and Water Conservation
VSLA	Village Saving and Loan Associations
WRI	World Resources Institute
WWF	World Wide Fund for Nature

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Introduction to AREECA

1.1 Short description of the implementing organizations

AREECA (Alliance for Restoration of Forest Ecosystems in Africa):
AREECA was implemented by a consortium of international and national partners, each contributing complementary expertise. Together, they combined technical, policy, and community-based capacities, enabling the programme to operate effectively from grassroots interventions to continental policy dialogue.

African Union Development Agency (AUDA-NEPAD):
AUDA-NEPAD provided strategic guidance for continental initiatives such as AFR100. In AREECA, it was envisioned to strengthen policy alignment and regional coordination. While challenges limited its operational role, the experience highlights the importance of empowering regional bodies to act as catalysts for scaling FLR across Africa.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ):
GIZ provides technical assistance on behalf of the German government and has extensive experience in natural resource governance, policy dialogue, and capacity development. Within AREECA, GIZ played a dual role. At the regional level, GIZ led the Project Management Unit (PMU), coordinating the overall implementation, ensuring coherence across the four country teams, and serving as the primary interface between the consortium and the donors. This role included oversight of financial and administrative management, facilitation of monitoring and reporting, and support to strategic communication and decision-making processes.

At the country level, GIZ was directly responsible for implementation in Cameroon, where it worked with government institutions and local communities to improve forest management, strengthen governance structures, and promote inclusive approaches to restoration.

Food and Agriculture Organization of the United Nations (FAO):
FAO is a specialized UN agency leading global efforts to achieve food security. Within AREECA, FAO implemented activities in Malawi, focusing on landscape restoration that supports livelihoods and strengthens food and water security. Together with the World Resources Institute, FAO supported monitoring in AREECA.

International Union for Conservation of Nature (IUCN):
IUCN is a global union of government and civil society organizations dedicated to conserving nature and promoting sustainable use of natural resources. It plays a central role in advancing FLR globally, notably through the Restoration Opportunity Assessment Methodology (ROAM) and coordination of the Bonn Challenge Secretariat. In AREECA, IUCN led activities in Rwanda and contributed to Malawi by enhancing governance frameworks, supporting gender-transformative restoration, and scaling best practices.

World Bank:
The World Bank contributed by linking AREECA to broader development finance and policy dialogues, ensuring that restoration approaches align with national development priorities and climate strategies. Its expertise in structuring finance helped connect restoration with long-term investment pathways.

World Resources Institute (WRI):
WRI is a global research organization that turns ideas into action for sustainable resource management. In AREECA, WRI supported analytical work, monitoring systems, and knowledge management, contributing tools and spatial decision-making frameworks.

World Wildlife Fund for Nature (WWF):
WWF is one of the world's largest conservation organizations, with a global network active in over 100 countries. In AREECA, WWF led implementation in Kenya, focusing on restoration of water catchments in the Upper Tana and Mau Forest ecosystems. This included the development of payment for ecosystem services (PES) schemes with downstream water utilities and support for resilient agroforestry systems.

1.2 International Climate Initiative (IKI)

The IKI is one of the key instruments of the German Federal Government for financing climate and biodiversity action globally. Its funds are provided by the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN).

IKI supports multi stakeholder projects that not only mitigate greenhouse gas emissions and adapt to climate change but also conserve biodiversity and strengthen local governance. It emphasizes innovation, institutional capacity building, and policy dialogue alongside concrete implementation, thus acting as a powerful enabler of sustainable transformation.

AREECA Quick facts:

Full Name: Alliance for Restoration of Forest Landscape and Ecosystems in Africa

Funding source: International Climate Initiative (IKI), German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN)

Project budget: 23,500,000 Euro

Project duration: September 2019 – March 2026

Geographic scope: Cameroon, Kenya, Malawi, Rwanda

Consortium partners: AUDA-NEPAD, FAO, GIZ (lead), IUCN, WWF, WRI, World Bank

Key objectives: Scale FLR, improve socio-economic and ecological benefits, strengthen governance on land tenure, support NDCs and Bonn Challenge/AFR 100

Main achievements:

17,076 ha directly restored

Planning processes on **5,362,409 ha**

50% indigenous trees planted

2.6 Mio. t CO_2 eq sequestered (until 2040)

274,8 million USD additional funding secured

1.3 AREECA Objectives

AREECA was established as a flagship initiative of the IKI to advance FLR at scale. Its overarching objective is to enhance the ecological functionality of degraded ecosystems while simultaneously strengthening livelihoods and resilience of local communities. AREECA pursued an integrated approach that combined ecological restoration with socio-economic development, thereby positioning FLR as a cross-cutting solution to climate change, biodiversity loss, and rural poverty. The programme placed particular emphasis on developing and testing restoration approaches that are scalable, cost-effective, and socially inclusive. At policy level, AREECA helped strengthen policy coherence at national level and contributed to national and regional restoration targets, including AFR100 and the Bonn Challenge, while at local level it demonstrated concrete models for community engagement, financing, and monitoring. The objectives were thus dual: to deliver tangible restoration on the ground and to influence governance frameworks for long-term sustainability.

1.4 Countries and scope

AREECA was implemented across four African countries (Cameroon, Kenya, Malawi, and Rwanda) each selected for its ecological diversity and strategic importance in regional restoration agendas. In Cameroon, the programme focused on integrating traditional forest governance, such as sacred forests, into formal restoration planning. In Kenya, activities targeted water tower ecosystems and agroforestry value chains, demonstrating how FLR contributes to water security and rural incomes. Malawi concentrated on co-management models for forest reserves, establishing multi-use forest blocks that balance conservation with sustainable resource use. In Rwanda, the programme advanced terracing, agroforestry, and innovative financial mechanisms such as the CECF. Together, these landscapes represent a wide range of biophysical and socio-economic contexts, allowing AREECA to generate comparative insights and scalable models. The scope extended beyond the country level, as the programme actively fostered regional knowledge exchange, south-south learning, and alignment with continental frameworks such as the African Union's climate and biodiversity strategies.

What is FLR?

Forest Landscape Restoration (FLR) is a long-term, integrated process that aims to regain ecological functionality and enhance human well-being in degraded or deforested landscapes. FLR goes beyond tree planting. It focuses on restoring multiple ecosystem services, such as soil fertility, water regulation, biodiversity, and carbon storage, while supporting livelihood opportunities and resilient local economies.

1.5 The role of implementing organizations in AREECA

The AREECA programme was built around a consortium model in which each partner contributed complementary expertise and responsibilities. Coordination was ensured by the PMU, led by GIZ. As the lead agency, GIZ was responsible for overall programme coordination and administration, financial management, and technical support to the country teams. GIZ also provided central monitoring and reporting functions that ensured accountability to donors and coherence across the four countries. In addition, GIZ directly implemented country level activities in Cameroon, where it worked with government and local partners to address the drivers of degradation in forest margins and agricultural landscapes.

WWF was responsible for implementation in Kenya. Drawing on its strong background in community-based conservation and private sector engagement, WWF coordinated restoration activities in highland catchments and dryland rangelands, working closely with community forest associations and water user associations. Its efforts focused on improving governance at local level, promoting agroforestry, and piloting innovative financing models that linked restoration with market opportunities.

In Rwanda, IUCN acted as the lead implementing partner. It worked with government institutions, district administrations, and local organisations to restore degraded hillsides, strengthen policy frameworks, and integrate gender transformative approaches into restoration. IUCN also supported FAO in Malawi by providing technical guidance and facilitating regional knowledge exchange as well as implemented the ROAM in Cameroon.

FAO implemented the programme in Malawi, where it concentrated on soil and water conservation, woodlot establishment, and integration of restoration into district development plans. Beyond its country role, FAO carried regional responsibilities across the AREECA consortium, leading work on monitoring of FLR outcomes. Together with WRI, FAO developed tools and capacity building activities that strengthened monitoring, reporting, and verification systems in all four countries.

AUDA-NEPAD was entrusted with Output IV, which aimed to link country level implementation with continental policy processes and to create stronger synergies with African initiatives such as AFR100. Although its role proved challenging, AUDA-NEPAD was envisioned to serve as a bridge between national restoration experiences and regional decision making.

The World Bank played a critical role in providing financial resources and in shaping the allocation of funds within the programme. Its involvement ensured alignment with wider international financing mechanisms and reinforced donor confidence in the programme's management structures.

WRI complemented FAO's regional monitoring role by contributing analytical tools and technical capacity for measuring restoration progress. It also facilitated knowledge management across the consortium and helped to connect AREECA outcomes with global reporting frameworks.

Taken together, the distribution of responsibilities among the seven partners reflected AREECA's multi-actor approach. GIZ ensured coherence and oversight, while the four country partners adapted restoration to local contexts. FAO and WRI provided cross cutting technical support on monitoring and capacity development, AUDA-NEPAD connected the programme to continental policy spaces, and the World Bank anchored the financing architecture. This collaborative structure allowed AREECA to link grassroots action with national policy and regional frameworks, demonstrating that restoration at scale requires both technical specialisation and institutional diversity.

2
Drivers of degradation and mitigation measures in AREECA countries

2.1 Cameroon

Drivers of degradation:
Cameroon's forest landscapes face increasing pressure from shifting cultivation, logging, and the expansion of cocoa and other agricultural crops. Population growth has accelerated forest clearing, while weak governance structures have allowed unsustainable exploitation of timber and non-timber forest products. In many regions, customary authorities historically regulated access to sacred forest patches, but these traditional norms are eroding. The result is habitat fragmentation, biodiversity loss, and declining water security.

Mitigation measures:
AREECA interventions in Cameroon built upon cultural traditions by revitalizing community governance around sacred forests. Local conventions were formalized to provide legal backing to customary rules, enabling communities to manage sacred sites as reservoirs of biodiversity and seed sources for surrounding degraded landscapes. GIZ supported the development of participatory land-use planning and strengthened forest governance frameworks. Restoration activities combined enrichment planting with native species and protection of natural regeneration, ensuring ecological and cultural values were maintained. This dual approach, linking tradition with formal policy, offers a replicable model for reconciling cultural heritage with modern conservation needs.

Sacred Forest in West Bamboutos, Cameroon

2.2 Kenya

Drivers of degradation:

Kenya's forests and rangelands face degradation from agricultural expansion, deforestation for timber and charcoal, and overgrazing in drylands. Catchments in the Upper Tana and Mau Forest complex are particularly affected, with deforestation leading to reduced water quality and flow variability downstream. This has direct economic consequences, as hydropower plants, irrigation schemes, and urban water utilities depend on these ecosystems. In dryland areas, recurrent droughts and unsustainable grazing practices have intensified land degradation and undermined resilience.

Mitigation measures:

AREECA interventions in Kenya emphasized linking upstream restoration with downstream economic actors through water funds and PES mechanisms. In the Upper Tana, farmers were supported to adopt agroforestry, terracing, and riparian buffer restoration, financed partly by contributions from water utilities and beverage companies benefiting from improved water supply. In rangelands, area closures and reseeding helped restore grassland productivity and reduce erosion. WWF worked with local communities to establish nurseries, providing both seedlings and income opportunities. By embedding restoration within a financing framework supported by private sector partners, Kenya demonstrated how FLR can be scaled through sustainable investment mechanisms.

Seedling in Rangeland (Kenya)

Bare soil at high risk of erosion (Kenya)

2.3 Malawi

Drivers of degradation:

Malawi's landscapes are under pressure from fuelwood demand, shifting cultivation, and overgrazing. Charcoal production is a major driver of deforestation, while expansion of agriculture into fragile catchments has accelerated erosion and reduced soil fertility. Land tenure insecurity and weak enforcement of forest laws have compounded the problem. Degradation is further driven by poverty, as rural households depend heavily on biomass for energy and forest products for livelihoods.

Mitigation measures:

AREECA interventions in Malawi focused on strengthening community-based forest governance. Through the establishment of co-management agreements between local communities and government, 25 forest blocks were brought under collaborative management. These agreements clarified rights and responsibilities, creating incentives for sustainable forest use. FAO supported technical restoration activities, including tree planting with fast-growing species for energy supply and enrichment planting with indigenous trees to restore ecological functions. Chiefs' forums played a crucial role in mobilizing traditional leadership to support restoration, ensuring legitimacy and enforcement at community level. This blend of governance reform and practical interventions represents an innovative pathway for balancing livelihood needs with long-term sustainability.

Burning residues in Farmland (Malawi)

Hedges in SWC system (Malawi)

2.4 Rwanda

Drivers of degradation:

In Rwanda, steep topography and high population density make land particularly vulnerable to erosion and degradation. Intensive agriculture on hillsides, deforestation for fuelwood, and encroachment into wetlands have accelerated soil loss and reduced water quality. Climate variability (especially heavy rainfall events) further exacerbates erosion and landslides. The scarcity of arable land has also driven cultivation into marginal areas, amplifying degradation pressures.

Mitigation measures:

AREECA built on Rwanda's long-standing commitment to restoration by promoting SWC structures, including terraces adapted to slope gradients. Bunds and check dams were installed to stabilize soils, while agroforestry systems were introduced to enhance productivity and diversify livelihoods. A key innovation was the establishment of the CECF, which provided microfinance linked directly to restoration outcomes. This mechanism incentivized farmer participation and ensured that ecological gains translated into social and economic benefits. District governments integrated restoration into development plans, institutionalizing approaches beyond the project cycle. Rwanda's combination of technical interventions with financial and governance innovations offers a strong example of integrated FLR.

Plantation in Kirehe (Rwanda)

3
Biophysical factors

3.1
Assessment of abiotic conditions relevant to FLR interventions

3.1.1 Soils

Soils are the foundation of ecosystem health and productivity, and their condition largely determines whether restoration efforts succeed or fail. In all four AREECA countries, soil degradation has been a central driver of landscape decline. Intensive cultivation without fallow, overgrazing, and the removal of organic matter have depleted fertility and disrupted soil structure. In Rwanda's densely populated highlands, steep slopes cultivated year after year are stripped of their topsoil by intense rainfall, leaving behind shallow, stony ground. Farmers often describe how fields that once produced abundant harvests now yield poorly, even with fertilizer inputs. Similar problems are seen in Malawi's plateaus, where continuous maize cultivation and charcoal production have exhausted soils.

FLR interventions under AREECA prioritized soil stabilization and fertility recovery as first steps toward ecological restoration. In Rwanda, terraces with stone bunds were constructed on slopes above 40 percent gradient, while progressive terraces combined with agroforestry species were applied on gentler slopes. These terraces reduce erosion, increase water retention, and create niches for diverse crops. In Malawi, contour bunds reinforced with vetiver grass provided slope stabilization and improved infiltration. ANR on overgrazed rangelands restored ground cover and gradually rebuilt soil organic matter. In Kenya's drylands, zai pits and semicircular bunds were applied to capture runoff and improve soil moisture in otherwise arid soils. Cameroon emphasized mulching, cover crops, and enrichment planting in forest margins to accelerate the recovery of fertility.

The central lesson is that soil management is not an add-on, but the entry point for restoration. Without healthy soils, planted trees fail to survive, crops remain unproductive, and communities lose confidence in the process. By combining structural measures, vegetation cover, and organic matter restoration, AREECA interventions created soils capable of supporting long-term ecological and livelihood benefits.

3.1.2 Topography

Topography dictates the processes and risks of degradation, and consequently the types of interventions required. In Rwanda and parts of Malawi, steep hillsides dominate the landscape. Slopes exceeding 30 percent are commonly cultivated, exposing soils to runoff and triggering gully formation that deepens with each rainy season. These gullies often extend for hundreds of meters, stripping fertile land and depositing sediment downstream in valleys and reservoirs. In contrast, Kenya's drylands are generally flat to gently undulating, where degradation is driven less by slope and more by vegetation loss and soil compaction. Cameroon's landscapes range from forested lowlands to highland ridges, where deforestation exposes fragile soils on slopes that once held dense vegetation.

AREECA designed topography-specific measures to counter these challenges. In Rwanda, radical terraces were installed on very steep slopes (>40 percent), supported by vegetative strips and stone bunds to prevent collapse. Progressive terraces and contour planting were applied on gentler gradients, with bund spacing of 5–10 meters depending on slope steepness, as recommended in FAO guide-

lines. In Malawi, terraces and ridging systems were combined with agroforestry to stabilize soils and increase productivity. Kenya's rangelands saw water-harvesting structures built in depressions and along contour lines to slow runoff and reduce erosion. Cameroon focused on reforesting degraded hillsides with native and multipurpose species to stabilize slopes and restore water regulation downstream.

By tailoring interventions to slope, elevation, and erosion risk, AREECA avoided a one-size-fits-all model. Instead, interventions reflected the physical logic of the land itself: steep slopes required engineering and vegetation cover, flat drylands required water harvesting and grazing management, and forested ridges required reforestation. This careful matching of measures to topographic realities proved critical to effectiveness.

3.1.3 Water resources

Water is both shaped by and shapes land degradation. Across the AREECA countries, hydrological systems are under severe pressure. Deforestation, overgrazing, and poor land management have increased runoff and reduced infiltration, leading to reduced groundwater recharge, more erratic streamflow, and higher sediment loads. In Rwanda, heavy rains wash eroded soil into rivers and lakes, lowering water quality and filling reservoirs with sediment. Kenya's Upper Tana catchment illustrates the costs of this process: siltation raises water treatment costs for Nairobi utilities and reduces hydropower efficiency. In Malawi, sediment-laden rivers undermine irrigation schemes and diminish storage capacity of dams. Cameroon's forest clearing disrupts the natural regulation of water flows, with downstream communities experiencing both floods and dry-season shortages.

AREECA interventions placed strong emphasis on watershed protection and the restoration of riparian zones. In Rwanda and Kenya, riparian buffers were restored with native vegetation, reducing erosion and providing habitat. Agroforestry systems on adjacent farmland further stabilized soils and improved infiltration. Malawi promoted watershed management committees to implement gully plugging, check dams, and afforestation in catchments feeding reservoirs. Cameroon restored wetlands and forested hillsides, recognizing their role as "green infrastructure" for water regulation. In Kenya, PES schemes linked upstream land users with downstream beneficiaries, ensuring that those who protect watersheds are rewarded by those who depend on clean water.

These interventions demonstrate that water security is a powerful entry point for restoration. When downstream utilities, industries, and communities feel the benefits of improved water supply and quality, they become strong allies in sustaining upstream interventions. AREECA leveraged this dynamic to turn ecological restoration into a shared socio-economic priority.

3.1.4 Biodiversity

Biodiversity underpins the functionality of ecosystems, but across AREECA landscapes it has been severely reduced by deforestation, overgrazing, and land conversion. In Cameroon, sacred forests represent islands of diversity surrounded by expanding agriculture. They shelter species that have disappeared from surrounding lands, but fragmentation threatens their viability. In Rwanda and Malawi, conversion of forests and woodlands to croplands has reduced habitat for pollinators, seed dispersers, and wildlife. Kenya's drylands have seen the loss of native grasses and shrubs, undermining grazing potential and making ecosystems more vulnerable to drought.

AREECA interventions aimed to rebuild biodiversity as a foundation for resilience. In Cameroon, enrichment planting with culturally and ecologically significant native species reinforced the ecological value of sacred forests. Rwanda promoted diverse agroforestry systems, where species such as the silk oak (Grevillea robusta), fruit trees, and nitrogen-fixing legumes provided ecological services and household benefits. Malawi adopted a dual strategy: fast-growing exotics (eucalyptus spec., Pinus spec.)

were planted to meet urgent fuelwood needs, while indigenous species such as miombo trees were restored for long-term ecosystem balance. In Kenya, reseeding rangelands with native grasses such as buffel grass (Cenchrus ciliaris) and Rhodes grass (Chloris gayana) brought back grazing productivity and improved soil stability.

Biodiversity is not just a conservation concern; it is a functional necessity. Diverse systems recover faster from shocks, maintain ecological processes, and provide multiple services for communities. By integrating biodiversity into restoration, AREECA not only rebuilt ecosystems but also enhanced their resilience to climate and human pressures.

3.1.5 Climate

Climate change and variability act as multipliers of degradation in all AREECA countries. Droughts in Malawi and Kenya reduce vegetation cover, leaving soils bare and exposed to erosion. In Rwanda, intense rainfall events are increasing, triggering landslides on deforested hillsides. In Cameroon, shifts in rainfall patterns stress forest ecosystems, altering regeneration dynamics and increasing fire risk in drier savanna zones. The result is a cycle in which degraded ecosystems become more vulnerable to climate extremes, while climate extremes accelerate further degradation.

AREECA integrated climate considerations into restoration from the outset. In Kenya's drylands, water harvesting structures and drought-tolerant grasses were introduced to help communities adapt to longer dry spells. In Rwanda's highlands, terraces and agroforestry belts stabilized slopes and reduced the likelihood of landslides. Cameroon promoted forest connectivity, enabling species to migrate and adapt as climate zones shift. Malawi focused on diversifying restoration strategies (combining tree planting, soil and water conservation, and community woodlots) to buffer households against the impacts of rainfall variability.

The choice of species was also guided by climate resilience. Fast-growing exotics were used where communities urgently needed biomass, but indigenous species close to the PNV were prioritized in areas dedicated to long-term ecological recovery. This mix ensured both short-term livelihood security and long-term adaptation capacity.

Ultimately, AREECA demonstrated that restoration is climate adaptation in practice. By rebuilding ecosystem functions (e.g. soil stability, water regulation, vegetation cover) FLR reduces vulnerability to extreme events and creates pathways for communities to adapt to a changing climate.

3.2 Assessment of biotic conditions

3.2.1 Potential natural vegetation (PNV)

Understanding the PNV of a landscape is essential for the strategic planning and ecological integrity of FLR interventions. PNV refers to the vegetation that would likely dominate a site in the absence of human interference, under current climatic and edaphic (soil-related) conditions. This concept provides a reference framework for restoration goals, guiding the selection of native species and informing decisions about ecosystem structure, function, and resilience.

In the context of the AREECA program, which spanned across diverse ecological regions in Malawi, Kenya, Cameroon, and Rwanda, the PNV varies considerably: From miombo woodlands and savannas to Afromontane forests and tropical montane cloud forests. For example, much of Malawi and parts of Tanzania and Zambia is characterized by miombo woodland, a fire-adapted ecosystem dominated by genera such as Brachystegia, Julbernardia, and Isoberlinia. These species play a critical role in nutrient cycling and carbon storage, making them a logical choice for large-scale landscape restoration in degraded areas.

In Kenya, the PNV varies from Acacia-Commiphora bushlands in arid and semi-arid zones to dry upland forests and Afroalpine vegetation in highland regions such as the Aberdares and Mount Kenya. Restoration in these contexts must balance ecological appropriateness with socio-economic needs, particularly in areas where fuelwood, grazing, and water provisioning are critical for livelihoods.

Cameroon presents high ecological diversity, especially in the western highlands and humid tropical lowlands. In areas such as the West Bamboutos, the PNV includes submontane and montane forests rich in endemic species, including Prunus africana and Schefflera abyssinica. These forests provide critical ecosystem services such as water regulation and soil protection. FLR in these zones should emphasize native tree species, avoid monocultures, and consider the integration of agroforestry to buffer intact forest fragments.

Rwanda, particularly in the Eastern Province (e.g., Kirehe and Nyagatare), was historically covered by open deciduous woodland and wooded grassland mosaics. Much of this has been converted to agriculture, but remnants of native flora, including Acacia, Combretum, and Albizia species, persist. Restoration efforts here can benefit from ANR and enrichment planting using species adapted to the local edaphoclimatic conditions.

Scientific tools such as remote sensing, historical vegetation maps, herbarium records, and ecological modelling have been used across AREECA countries to assess PNV. However, participatory approaches (engaging local communities and integrating traditional ecological knowledge) have also proven vital for verifying ecological baselines and ensuring local relevance.

In conclusion, aligning FLR interventions with PNV enhances ecological functionality, improves biodiversity outcomes, and increases the likelihood of restoration success. It also fosters long-term sustainability by reinforcing native ecosystem dynamics rather than imposing exotic or poorly adapted species compositions.

3.2.2 Interspecific competition

Interspecific competition, the interaction between individuals of different species competing for the same limited resources, is a fundamental ecological process that significantly influences the outcomes of FLR efforts. It affects species establishment, growth dynamics, community composition, and overall ecosystem stability. Understanding the mechanisms and implications of interspecific competition is critical for designing restoration interventions that foster biodiversity, resilience, and functional recovery.

In FLR contexts, interspecific competition typically manifests in three major resource domains: light, water, and soil nutrients. In newly restored landscapes, early successional species (often fast-growing and light-demanding) can outcompete slower-growing late-successional species, potentially leading to simplified vegetation structures. This dynamic, while initially favourable for rapid biomass accumulation, may hinder long-term forest development and biodiversity recovery if not managed appropriately.

Light competition is particularly intense in dense planting schemes or during natural regeneration where pioneer species create closed canopies. Shade-intolerant species may be excluded, and vertical stratification may take years to develop. Consequently, planting arrangements (e.g., spacing, species layering) should be designed to accommodate differential light requirements across species and successional stages.

Below-ground competition, involving water and nutrients, is less visible but equally critical. Tree species with similar rooting depths or nutrient acquisition strategies may compete strongly, reducing growth performance and increasing mortality. Mixed-species plantings should ideally combine species with complementary root architecture and phenologies to reduce niche overlap and enhance overall productivity, a principle known as niche differentiation.

In addition to direct resource competition, indirect effects such as allelopathy (chemical inhibition by

one plant on another) and facilitative interactions (e.g., nitrogen fixation by legumes) also shape competitive outcomes. Restoration efforts that incorporate functional diversity (the use of species with varied ecological roles) can reduce negative interactions and enhance ecosystem functions like soil stabilization, hydrological regulation, and pest control.

Monitoring interspecific competition is essential, especially during the early stages of FLR. This can be achieved through periodic assessments of species growth rates, canopy closure, and survival rates. Adaptive management, including selective thinning, enrichment planting, and staggered planting regimes, can mitigate undesirable competitive effects and steer the restoration trajectory toward desired reference conditions.

In summary, interspecific competition is not merely a constraint in restoration but also a dynamic that, when understood and harnessed, can be leveraged to shape robust, diverse, and resilient ecosystems. Strategic species selection, spatial arrangement, and temporal planning are key to minimizing detrimental competition while maximizing complementarity and ecological function.

3.2.3 Pathogens

Pathogens (organisms such as fungi, bacteria, viruses, and nematodes that cause disease in plants) pose significant challenges to FLR. Their impact ranges from reduced growth and productivity to widespread mortality, often undermining restoration success and ecosystem resilience. In the context of FLR, understanding pathogen dynamics is essential for planning, species selection, and long-term ecosystem management.

Plant pathogens are a natural component of forest ecosystems and play roles in structuring plant communities, facilitating succession, and regulating species dominance. However, in disturbed or simplified landscapes, such as those targeted by restoration, pathogens can exert disproportionate influence due to reduced biodiversity, low functional redundancy, and altered microclimates. This is particularly true in monospecific plantations or poorly planned mixed species stands, where a lack of genetic and species diversity can create favourable conditions for pathogen outbreaks.

A key consideration in restoration is the distinction between endemic and introduced pathogens. Endemic pathogens often have co-evolved relationships with native species, typically resulting in manageable or self-limiting infections. In contrast, introduced or invasive pathogens (e.g. Phytophthora cinnamomi, Cryphonectria parasitica, or Fusarium oxysporum) can devastate naïve plant populations lacking evolved resistance. Globalization, plant material movement, and changing climate conditions have increased the frequency and scale of such introductions.

Environmental stress like drought, nutrient deficiency and poor soil can predispose plants to infection, increasing pathogen virulence. Restoration sites are often characterized by such stresses, especially during the early stages of establishment. For this reason, site preparation, species-site matching, and early maintenance (e.g., mulching, watering, and soil amendment) are crucial to reducing pathogen susceptibility.

IPPM approaches are increasingly applied in FLR contexts. Key strategies include:

- Diverse species selection: Avoiding dominance of one or few species reduces host density and pathogen transmission.
- Use of disease-resistant or locally adapted genotypes: Promotes resilience and limits infection spread.
- Phytosanitary practices: Ensuring clean planting material and minimizing contamination during transport and planting.
- Biological control and beneficial soil organisms: Encouraging soil microbial diversity can suppress soil-borne pathogens through competition and antagonism.

Climate change adds complexity to pathogen management in FLR. Warming temperatures, altered precipitation regimes, and increased frequency of extreme events can shift pathogen ranges, lifecycles, and host susceptibility. This necessitates forward-looking restoration planning that anticipates novel pathogen pressures and incorporates adaptive monitoring systems.

In conclusion, pathogens represent both ecological regulators and potential threats in restoration systems. A proactive and ecologically informed approach to disease management, emphasizing diversity, local adaptation, and early intervention, can significantly enhance the success and sustainability of FLR efforts.

3.2.4 Species dispersal and connectivity

Species dispersal and landscape connectivity are central ecological principles in FLR, directly influencing biodiversity recovery, ecosystem functionality, and long-term resilience. Dispersal refers to the movement of organisms (especially plant propagules and animal species) across space, while connectivity denotes the degree to which the landscape facilitates or impedes such movement. Successful restoration hinges on enabling these processes, particularly in fragmented or degraded environments where natural regeneration and species persistence are constrained.

In fragmented landscapes, isolation of habitat patches disrupts gene flow, reduces population viability, and impairs ecological processes such as pollination, seed dispersal, and predator-prey interactions. This is particularly critical in forest systems where many plant species rely on biotic vectors (birds, bats, primates, and ungulates) for seed dispersal. The absence or reduced mobility of these vectors in disconnected landscapes can severely limit the natural regeneration potential of degraded sites.

Connectivity can be conceptualized in both structural and functional terms. Structural connectivity refers to the physical arrangement of landscape elements, e.g., forest patches, corridors, and riparian buffers, while functional connectivity focuses on how organisms move through these structures. FLR planning must consider both dimensions, identifying critical nodes and corridors that can re-establish ecological flows across the landscape.

One approach widely applied is the restoration of ecological corridors, such as riverine forests, hedgerows, or stepping-stone patches that allow for safe and continuous movement. In agricultural mosaics, agroforestry systems can serve as permeable matrices, reducing the harshness of the landscape for wildlife and facilitating dispersal. Additionally, assisted migration, which is the deliberate introduction of species to new suitable areas, may be appropriate in specific cases, especially under rapidly changing climate conditions.

A concrete application of these principles can be found in Kenya, around the Amboseli National Park. This region has experienced extensive land fragmentation due to agriculture, fencing, and human settlement, severely impeding wildlife movement between protected areas such as Amboseli, Chyulu Hills, and Tsavo. In response, AREECA partners worked to restore ecological connectivity through targeted reforestation and community-managed corridors that link key habitats. This not only supports biodiversity conservation, particularly for migratory species such as elephants (Loxodonta africana), but also enhances ecosystem services such as water flow regulation and climate buffering.

To be effective, connectivity restoration requires an integrated landscape approach, combining ecological data (e.g., species movement modelling, habitat suitability mapping) with socio-economic realities (e.g., land tenure, community priorities). Engaging local stakeholders in the planning and management of corridor networks is crucial for long-term sustainability and conflict mitigation, especially in human-wildlife interface zones.

In summary, species dispersal and connectivity are foundational to ecological recovery in FLR. Their restoration is not only a matter of spatial planning

but of rewriting the functional tapestry of ecosystems. As demonstrated in Amboseli and elsewhere, promoting connectivity enhances resilience, supports species persistence, and contributes to the overall integrity of restored landscapes.

Overview of the main biophysical FLR interventions

Plantations: Establishing trees in various forms, including single-tree plantations along roads, reforestation of degraded stands, and multipurpose tree plots to restore forest cover and provide ecosystem services.

Area Closures: Temporarily or permanently excluding grazing and other disturbances in degraded areas to allow natural regeneration and ecosystem recovery.

Soil and Water Conservation (SWC): Implementing terraces, bunds, check dams, and cover crops to reduce erosion, improve soil fertility, and enhance water retention.

Agroforestry Systems: Integrating trees with crops and/or livestock to improve productivity, diversify income sources, and provide ecological benefits.

Rangeland Restoration: Rehabilitating degraded grazing lands through techniques such as earth bunds, reseeding, and controlled grazing to improve pasture quality and biodiversity.

4

Socio-economic factors

4.1 Demographics

Demographic factors play a central role in shaping both the drivers of land degradation and the opportunities for FLR. Understanding population structures, distribution patterns, and socio-economic characteristics is essential for designing FLR strategies that are not only ecologically effective but also socially relevant and inclusive.

In the AREECA countries demographic dynamics are marked by high rural population densities, youthful age structures, and strong dependence on land-based livelihoods. These patterns exert significant pressure on natural resources, particularly through agricultural expansion, fuelwood collection, and informal settlement growth. At the same time, they also present opportunities: a large rural labour force, strong community networks, and land-user familiarity with local ecosystems can be valuable assets in scaling up restoration activities.

One critical demographic trend is the high proportion of youth in rural areas. In all four countries, over 50% of the population is under the age of 25. This presents both a challenge and an opportunity for FLR. On one hand, rural youth face high rates of unemployment and underemployment, which can drive land degradation through unsustainable land use. On the other hand, if engaged meaningfully, youth can act as key agents of change, implementing and sustaining restoration practices. Programs that offer green livelihood training, agroforestry entrepreneurship, or restoration-related digital skills (e.g., GIS, drone mapping) have shown promising results.

Gender dynamics also intersect strongly with FLR. Women in many rural areas bear the primary responsibility for household food production, fuelwood collection, and water access. These activities are directly affected by the state of the landscape. However, women often have limited access to land ownership, decision-making structures, and extension services. Addressing these imbalances through targeted engagement, training, and benefit-sharing mechanisms is crucial for equitable and effective restoration outcomes.

Population growth and migration trends further influence FLR feasibility. Rapid population growth in Malawi and Rwanda, for example, leads to land fragmentation, shorter fallow periods, and intensified land use; all of which exacerbate degradation. In contrast, some areas in Kenya and Cameroon have experienced rural outmigration, creating abandoned or underutilized lands that offer potential for large-scale restoration, provided tenure is clarified and local support is secured.

Spatial population distribution also matters. In densely populated zones (e.g., Rwanda's highlands), FLR must prioritize integrated land use systems such as agroforestry, soil conservation, and slope stabilization. In sparsely populated or remote areas (e.g., parts of northern Kenya or Cameroon's forest corridors), restoration can focus more on natural regeneration, ecosystem connectivity, and large-scale reforestation.

Lastly, literacy levels, education access, and language diversity influence how restoration messages are communicated and understood. Effective FLR programming requires culturally and linguistically adapted extension materials, participatory training methods, and capacity development strategies that are responsive to local educational realities.

In summary, demographic analysis is not a peripheral task in FLR; it is a prerequisite for context-sensitive planning, equitable participation, and long-term

sustainability. Recognizing the human dimensions of the landscape allows restoration practitioners to design interventions that are socially embedded and demographically informed.

4.2 Land tenure systems and regulations

Land tenure are the legal or customary arrangements governing land access, use, and control and is one of the most decisive socio-economic factors affecting FLR. Secure and equitable land tenure is not only a matter of social justice but also a precondition for sustainable land management. Where land rights are clear, enforceable, and recognized by both law and local practice, land users are more likely to invest in restoration, protect natural resources, and adopt long-term stewardship practices. Conversely, insecure, disputed, or overlapping tenure settings can deter restoration, trigger conflict, and undermine project outcomes.

Across the AREECA countries, land tenure systems are diverse, often pluralistic, and shaped by a combination of statutory laws, customary norms, and informal practices. In many cases, these systems coexist in the same landscape, leading to uncertainty over who has the right to make decisions, plant trees, access forest products, or benefit from ecosystem services.

In Malawi, most land is held under customary tenure, administered by traditional authorities. Although recent reforms, such as the 2016 Land Act, have aimed to formalize and register customary land rights, implementation remains limited, especially in rural areas. For example, in the Chikwawa District, a forest restoration project collaborated with both the Ministry of Natural Resources and local chiefs to identify degraded community forest areas, jointly develop restoration plans, and secure community buy-in. This approach ensured both formal legitimacy and traditional approval, improving long-term sustainability of restoration efforts.

Kenya has made significant strides in land tenure reform, including the recognition of community land rights under the 2016 Community Land Act. However, many communities, especially in arid and semi-arid regions, still lack formal title or collective registration, making them vulnerable to land grabs or external investments that may not align with FLR objectives. Clarifying and protecting these rights is essential, particularly in landscapes targeted for restoration corridors or grazing land regeneration.

In Cameroon, land tenure is governed by a mix of state ownership and customary claims, with the state retaining legal ownership of most forested land. While communities can obtain user rights or enter into co-management agreements, bureaucratic processes are often slow and non-transparent. This can limit community incentives to invest in tree planting or forest enrichment, as benefits are not guaranteed. Projects must therefore include tenure clarification processes and advocacy for community-based forest management models.

Rwanda, by contrast, has implemented a nationwide land registration program, leading to one of the highest rates of land tenure formalization in Africa. Most landholders now possess formal titles, which has facilitated planning and implementation of landscape restoration at scale. Nonetheless, issues remain around women's access to land, especially in cases of inheritance or divorce, and around overlapping land uses in pastoralist zones.

Tenure-related challenges also affect specific restoration interventions. For example, ANR requires secure rights not only to the land but also to regenerating vegetation. Without clear agreements, trees may be cut down by others claiming overlapping rights. Similarly, communal interventions, such as riverbank rehabilitation or rangeland restoration, require robust collective governance arrangements that go beyond individual property rights.

To address these issues, FLR programming under AREECA adopted several strategies:

- Participatory land use planning, involving communities, local authorities, and technical staff to

clarify land boundaries and align restoration with actual land use patterns.

- Conflict-sensitive approaches, including mediation processes and grievance mechanisms to resolve disputes before they escalate.

- Awareness raising and legal literacy, to help land users understand their rights and responsibilities, and to navigate formal land administration systems.

- Advocacy for policy reform, supporting governments in harmonizing land laws with FLR goals and strengthening the legal recognition of customary and communal rights.

- In conclusion, land tenure is both a barrier and an enabler of FLR. Restoration interventions that fail to engage with tenure realities are unlikely to be sustained. Conversely, efforts that proactively clarify, protect, and strengthen land rights can unlock community commitment, reduce conflict, and anchor restoration in durable social foundations.

4.3 Governance structures

4.3.1 Role of the government

Governments play a central and multifaceted role in enabling, guiding, and sustaining FLR. Their engagement is critical across all stages of the restoration process: From policy formulation and strategic planning to coordination, implementation, monitoring, and long-term institutionalization. In the AREECA countries, governmental actors at national and sub-national levels provide the political mandate, legal framework, and often the operational infrastructure within which restoration activities unfold.

One of the government's key functions is to establish a clear policy environment for FLR. This includes integrating restoration targets into national development plans, climate strategies (e.g., Nationally Determined Contributions, NDCs), biodiversity frameworks, and land use policies. Government leadership ensures that FLR is not treated as a disconnected environmental effort, but as part of a broader development agenda encompassing agriculture, water, energy, and rural livelihoods.

Governments also have the authority to develop and enforce legal and regulatory frameworks that support restoration. These may include forestry and land laws, environmental protection acts, and natural resource management guidelines. In countries like Rwanda and Kenya, for example, government-backed national FLR strategies have created structured pathways for aligning local interventions with national priorities and international commitments (e.g., the Bonn Challenge and AFR100).

At the operational level, government line ministries, such as ministries of environment, forestry, agriculture, and water, coordinate and often implement restoration programs, either directly or in partnership with NGO's and community-based organizations. These ministries typically oversee technical standards, resource allocation, and capacity building for lower-level actors. Their field offices serve as crucial interfaces between policy and practice.

Importantly, governments are also responsible for mobilizing and managing financial resources for FLR. This includes domestic budget allocations, international climate finance (e.g., from the GCF or GEF), and coordination of donor-funded programs like AREECA. In this context, government institutions must demonstrate the ability to absorb and manage funds transparently, which requires strong public financial management systems and accountability mechanisms.

A critical enabling function is the facilitation of cross-sectoral and multi-stakeholder coordination. Given that FLR inherently cuts across sectors, governments must create platforms where actors from different ministries, civil society, the private sector, and local communities can coordinate efforts. Multi-stakeholder steering committees or national restoration working groups, supported by clear terms

of reference and data-sharing protocols, are key instruments in this regard.

In the AREECA project, governments were also instrumental in scaling and institutionalizing FLR practices. For instance, by embedding restoration approaches into national extension systems, agricultural training centres, or forest management curricula, governments help ensure that FLR knowledge and practice continue beyond the lifespan of individual projects. This role is particularly important for exit strategies, as it guarantees a handover of responsibility from external actors to nationally owned systems.

However, challenges remain. Government agencies in many contexts face capacity gaps, particularly at the sub-national level, where staff shortages, limited budgets, and weak enforcement constrain effective implementation. Fragmented mandates between ministries, policy incoherence, and bureaucratic inertia can also delay progress. Strengthening institutional coordination and investing in human and technical capacity are therefore ongoing priorities.

In summary, the role of the government in FLR is not limited to oversight: It is one of strategic leadership and operational integration. When governments actively coordinate and invest in restoration, they create conditions for inclusive, large-scale, and lasting impact.

4.3.2 Traditional governance structures

Traditional governance structures (such as village elders, customary chiefs, lineage heads, and local councils) play a vital yet often underappreciated role in shaping land use, resource management, and the social acceptability of FLR interventions. In many rural areas of the AREECA countries, these customary institutions hold considerable authority and legitimacy, particularly where state presence is limited or formal land administration is weak. As such, engaging traditional governance actors is not only a question of cultural sensitivity, but a strategic imperative for effective and sustainable restoration. These institutions are often custodians of customary land tenure systems, which regulate who may access, cultivate, or inherit land. They also enforce social norms related to the use of forests, water sources, sacred groves, and communal grazing lands. This regulatory function gives traditional leaders leverage over key FLR-related behaviours, such as tree cutting, fire control, and grazing restrictions. When properly engaged, they can support restoration by issuing local by-laws, organizing community labour, resolving conflicts, and legitimizing new land use agreements.

In Malawi, for example, traditional authorities are central to the allocation and administration of customary land, which accounts for over 80% of the country's land area. Chiefs have been directly involved in identifying degraded areas, endorsing FLR sites, and mobilizing community participation. In Kenya's pastoralist regions, elders and clan leaders often arbitrate grazing rights and seasonal access to rangelands, which is critical for the success of restoration measures such as rotational grazing and rangeland reseeding. In Cameroon and Rwanda, traditional authorities influence forest use practices and have been instrumental in promoting tree planting in buffer zones or along riverbanks.

However, the influence of traditional governance is not uniform across regions or social groups. In some contexts, traditional leaders have been co-opted into political structures or face declining legitimacy among youth or marginalized groups. In others, there may be tensions between customary and statutory governance, especially when their decisions conflict with national laws or land policies. FLR practitioners must navigate this complexity carefully, ensuring that engagement with traditional leaders does not reinforce existing power imbalances or exclude vulnerable voices.

A best-practice approach is to establish complementary relationships between traditional and formal governance systems, linking customary authorities directly to land-use planning and FLR decision-making. For example, FLR committees at the village level can include both elected representa-

tives and customary leaders, who help identify priority areas for restoration based on local land-use patterns, tenure rights, and community priorities. Training and sensitization workshops for traditional leaders strengthen their understanding of restoration objectives, legal frameworks, and ecological principles, enabling them to guide land-use planning decisions that are both socially accepted and ecologically effective. This ensures that FLR activities are aligned with local land governance, reducing conflicts and enhancing sustainability.

Moreover, integrating traditional ecological knowledge into restoration planning can improve the cultural resonance and ecological appropriateness of interventions. This includes knowledge about local species, seasonal cycles, soil characteristics, and landscape history, which is often passed down orally and embedded in community rituals or taboos. Recognizing and valuing this knowledge fosters mutual respect and strengthens local ownership.

In conclusion, traditional governance structures are essential partners in FLR. Their authority, proximity to land users, and embeddedness in community life position them as enablers of behaviour change, mediators of land use conflicts, and custodians of local ecological knowledge. For FLR to be both effective and enduring, it must work with these institutions, while promoting inclusive and accountable decision-making.

4.4 Cultural dimensions

Cultural beliefs, values, practices, and worldviews fundamentally shape how people perceive and interact with the landscapes they inhabit. In the context of FLR, culture influences decisions about land use, species selection, ecosystem services, and intergenerational knowledge transfer. Acknowledging and integrating these cultural dimensions into restoration efforts is essential for ensuring that interventions are socially accepted, ecologically grounded, and resilient over time.

Across the AREECA countries, culture is deeply embedded in people's relationship with land and forests. In many communities, forests are not only sources of fuelwood or timber, but also sites of spiritual significance, ancestral connection, and communal identity. Sacred groves, burial trees, and ceremonial sites often hold cultural restrictions against felling or burning, effectively functioning as traditional conservation zones. Recognizing these culturally protected areas can complement formal FLR planning and strengthen local conservation ethics.

Language and oral traditions also play a key role. Indigenous and local languages contain rich ecological vocabularies, including names for native tree species, soil types, seasonal indicators, and animal behaviours. These knowledge systems are not static; they evolve with changing environmental conditions but often carry locally adapted strategies for ecosystem management, such as rotational grazing, fire control, or seed selection. Restoration efforts that build upon these traditions are more likely to resonate with local communities and gain long-term support.

Cultural norms and taboos can shape what types of FLR activities are deemed acceptable. In some areas, planting certain tree species may carry symbolic meaning, either sacred or profane. For instance, trees like Ficus, Baobab, or Erythrina may be associated with fertility, protection, or spirits, influencing community willingness to plant or protect them. Similarly, gender roles in land management are often culturally defined. In many contexts, men and women hold different knowledge, access rights, and responsibilities, which must be considered during restoration planning and implementation.

Seasonal and ritual calendars can also influence labour availability and timing of interventions. For example, tree planting campaigns that coincide with harvests, weddings, or religious festivals may suffer from low participation unless they are integrated into these social rhythms. In contrast, aligning restoration events with community celebrations, such as tree-planting days, environmental awareness

weeks, or school competitions, can create positive reinforcement and collective momentum.

It is equally important to consider how cultural values relate to land inheritance, ownership, and authority. In many customary systems, land is passed down through patrilineal or matrilineal lines, and decisions about tree planting or fallow management may be influenced by these norms. Misalignment between external restoration models and local inheritance patterns can generate tension, particularly if restoration is perceived as locking land into a certain use that conflicts with expected transfers or uses.

FLR programs under AREECA addressed cultural dimensions through participatory approaches, ethnobotanical assessments, and community dialogue. By involving elders, traditional healers, women's groups, and youth leaders in the design and review of interventions, programs were better positioned to anticipate cultural sensitivities and build upon local strengths.

In summary, culture is not a barrier to restoration, it is rather a powerful enabler. By understanding and integrating cultural dimensions, FLR can become a socially embedded process, one that aligns ecological objectives with community identity, heritage, and meaning. Restoration that respects and revitalizes cultural connections to the land is more likely to be embraced, maintained, and passed on to future generations.

Training on honey production and distribution of beekeeping material (Malawi)

4.5 Market linkage

4.5.1 Local markets

Local markets play a pivotal role in shaping the sustainability and economic relevance of FLR. They provide the primary outlet through which smallholder farmers and community-based producers can monetize the goods and services that restored landscapes offer, whether timber, non-timber forest products, fruits, fodder, honey, charcoal, or ecosystem-based services. Strengthening linkages to local markets is therefore not merely a matter of economic development, but a strategic mechanism to incentivize continued stewardship of restored land.

In the AREECA countries, local markets are often the first and most accessible economic opportunity for rural communities engaged in restoration. Most restoration-based products are initially consumed, traded, or sold within informal, decentralized marketplaces such as weekly trading centres, roadside stalls, or village-based cooperatives. These markets offer flexibility and low entry barriers but are frequently constrained by challenges such as price volatility, limited storage infrastructure, and lack of quality standards.

A well-functioning local market system supports FLR in several ways:

- It provides short-term economic returns, which are essential for maintaining community engagement, especially in the early years before long-term ecological benefits materialize.
- It helps close the incentive gap between conservation and exploitation by allowing sustainable resources to be economically viable.
- It creates multiplier effects, stimulating local employment in processing, transport, and trade, particularly important for youth and women.
- However, to fully realize these benefits, certain enabling conditions must be addressed. Many rural producers lack market information, including prices, demand trends, and buyer contacts. This asymmetry often leads to low bargaining power and dependency on intermediaries. Furthermore, limited infrastructure, such as feeder roads, storage facilities, and transport services, can erode the profitability of restoration-linked value chains. Perishables like fruits and mushrooms, for example, are highly susceptible to post-harvest losses if not processed or sold quickly.

To overcome these barriers, AREECA supported interventions aimed at strengthening producer-market interfaces. These include the formation of producer groups, training on post-harvest handling, and the introduction of mobile-based price information systems. In some areas, local governments and project partners have facilitated market days or trade fairs, where restored products can be showcased, tested, and directly linked to consumers.

Another strategy is the integration of restoration with local value addition. Simple, low-cost technologies, such as honey processing units, fruit dryers, or charcoal briquetting presses, can significantly improve product quality and marketability. These interventions not only raise incomes but also reduce environmental pressure by making sustainable harvesting more attractive than extractive practices.

Importantly, local markets are not only economic venues but also social institutions, embedded in networks of trust, reputation, and cultural norms. FLR programming must take these dimensions into account, for example, by ensuring that market-related training courses are inclusive, that collective sales mechanisms are transparent, and that landless or marginalized groups can participate meaningfully.

In conclusion, local market linkage is a critical bridge between ecological restoration and rural development. It transforms FLR from a conservation narrative into a livelihood opportunity, thereby reinforcing the incentive to protect and expand restored areas. By investing in local markets through infrastructure, training, and cooperative organization, restoration becomes more than an ecological

Crafted seedlings (Rwanda)

goal; it becomes a practical and profitable choice for land users.

4.5.2 National markets

While local markets are essential for providing immediate economic returns to smallholder producers, access to national markets is key to unlocking larger-scale, sustained benefits from FLR. National markets offer broader demand, higher volumes, and support professionalized value chains that add stability and growth potential to restoration-linked livelihoods. For communities engaged in FLR, national markets present an opportunity to scale up production, improve product standards, and participate in more formalized economic systems.

In the AREECA countries, a range of restoration-compatible products has the potential to be competitively supplied to national markets.

These include:

- Tree-based commodities, such as timber, poles, firewood, and charcoal (when sustainably produced)
- Agroforestry outputs, including fruits (e.g., mango, avocado, citrus), nuts, and fodder crops
- NTFPs, such as honey, medicinal plants, and resins
- Processed goods, like dried mushrooms, essential oils, or herbal teas

However, integrating restoration-based products into national markets is complex. National markets tend to be more regulated and quality-driven than local markets. They often involve larger buyers (wholesalers, supermarket chains, or institutional buyers) who require consistency in supply, adherence to safety and quality standards, and often formal business registration. Smallholders and producer groups must therefore build organizational, technical, and financial capacity to meet these expectations.

Avocado seedling (Cameroon)

A key barrier is market readiness. Many producers engaged in FLR activities operate informally and lack the systems for aggregation, sorting, grading, packaging, and transport that are essential for entering formal value chains. For instance, while honey production is widespread across AREECA landscapes, much of it does not meet national food safety standards due to inadequate filtering, moisture control, or hygiene during processing. Without support, this limits producers to informal sales and precludes entry into larger domestic outlets.

Another challenge is geographic marginalization. Restoration often takes place in remote or degraded areas with limited infrastructure. Poor roads, weak logistics, and distance from urban centres can increase transport costs and reduce price competitiveness. FLR programs must therefore consider not only production but also market system development, including investment in aggregation centres, storage units, and linkages to transport networks.

AREECA addressed these gaps through targeted interventions, including:

- Formation and formalization of cooperatives, which can collectively negotiate contracts, access credit, and comply with market requirements
- Capacity building in business skills, such as record-keeping, branding, business plan development and customer relations
- Public-private partnerships that connect producer groups with national buyers, processors, or retailers
- Support for product certification and labelling, helping FLR-linked goods stand out in competitive markets
- National governments also play a role, for example by integrating FLR value chains into national agricultural strategies, offering subsidies or tax incentives for sustainable production, and enforcing regulations that support fair competition and environmental compliance.

Importantly, national markets can drive landscape-scale restoration when they generate reliable demand for restoration-friendly products. For example, growing national demand for sustainably produced charcoal or indigenous fruit species can encourage widespread adoption of agroforestry systems. Likewise, inclusion of FLR-based commodities in school feeding programs, public procurement schemes, or government reforestation campaigns can anchor demand and stabilize prices.

In summary, national markets represent a powerful vehicle for mainstreaming FLR into the economic fabric of a country. They offer scale, structure, and sustainability; provided that producers are equipped to participate, and that enabling environments are in place. For FLR to become a national movement, not just a rural initiative, market integration at the national level is essential.

4.5.3 International markets

International markets represent the upper tier of commercial opportunity for products and services originating from restored landscapes. They offer access to diversified demand, premium prices, and foreign exchange earnings, potentially transforming restoration from a locally focused intervention into a driver of macro-level economic growth and green branding. At the same time, entry barriers are high: strict quality and phytosanitary standards, certification requirements, complex logistics, fluctuating currency values, and intense global competition. Exploring international market linkage for FLR products must therefore be approached strategically, with clear-eyed assessments of comparative advantage, production capacity, and institutional support.

Several trends underpin growing overseas interest in restoration-compatible commodities:

Consumer and corporate demand: Rising awareness of sustainably sourced products, reinforced by voluntary standards such as the Forest Stewardship Council (FSC), Rainforest Alliance, and Fairtrade, is matched by corporate commitments to deforestation-free supply chains. This is increasing demand for traceable agroforestry commodities, including cocoa, coffee, rubber, and palm alternatives.

Emerging markets for niche products: Global markets for NTFPs are expanding. Additionally, ecosystem-service markets, especially carbon credits from verified restoration, are creating new revenue streams.

Key conditions for market participation: To translate these trends into tangible benefits, enabling conditions must be met:

- **Product consistency and volume:** Smallholders need aggregation through cooperatives or out-grower schemes to meet buyer requirements.
- **Quality assurance and traceability:** Compliance with international regulations (e.g., EU Organic, US Food Safety Modernization Act (FSMA)) requires robust testing, tracking, and increasingly digital traceability platforms.
- **Certification and due diligence:** Third-party certification builds credibility but carries costs; collective or group schemes can reduce the burden.
- **Logistics:** Export-oriented perishables require cold chains, storage, and efficient customs procedures.
- **Trade facilitation and policy support:** Streamlined procedures, supportive trade agreements, and infrastructure investment reduce transaction costs.

Opportunities beyond commodities:

- **Carbon and biodiversity credits:** Verified restoration projects can generate tradable units under compliance or voluntary schemes. Fair benefit-sharing with local communities is essential.
- **Eco-tourism and nature-based experiences:** Restored landscapes with biodiversity, cultural heritage, or unique ecosystems can attract visitors, provided infrastructure and safety standards are met.
- **Intellectual property and bioprospecting:** Ethnobotanical knowledge linked to restored habitats may yield pharmaceutical or cosmetic partnerships, requiring equitable benefit-sharing and protection of traditional knowledge rights.

Potential risks and mitigation:

- **Market volatility:** Diversifying products and markets can buffer price shocks.
- **Power asymmetries:** Producer alliances, transparent contracts, and government support can strengthen bargaining positions.
- **Compliance costs**: Subsidized audits, capacity-building, and phased pathways can help smallholders participate.
- **Over-exploitation:** Strong resource-management plans and independent monitoring prevent unsustainable harvesting.

Strategic considerations:
A measured approach is recommended: pilot exports with a limited portfolio, reinvest earnings into quality improvement, and gradually expand. Public-private partnerships and development finance can support infrastructure and reduce risk. Crucially, value captured from international trade should feedback to land stewards to sustain incentives for restoration.

In sum, international markets offer substantial but demanding avenues for monetizing FLR outcomes. Success hinges on rigorous standards, collective action, supportive policy frameworks, and vigilant safeguards to ensure that global demand translates into sustainable, inclusive benefits for both people and restored ecosystems.

Fruit tree seedling on private farm land in malawi as part of Agrofrestry scheme

5
General FLR approaches

5.1
Stakeholder management

Stakeholder engagement is a cornerstone of effective FLR, as it ensures that diverse interests, knowledge systems, and governance levels are integrated into the restoration process. In the AREECA programme and beyond, stakeholder engagement encompassed a wide array of actors (from local farmers and community-based organizations to national governments and international donors) each playing a distinct and complementary role in shaping restoration outcomes.

Local stakeholders and land users

At the foundation of FLR are smallholder farmers, pastoralists, and forest-dependent communities, who directly interact with the land daily. These groups are both the stewards and beneficiaries of restoration, and their involvement is essential for the relevance, acceptance, and sustainability of interventions. Local stakeholders contribute invaluable traditional ecological knowledge, participate in resource mapping, and are instrumental in planning and implementing restoration practices such as tree planting, agroforestry, and ANR.

Effective engagement at this level requires inclusive processes that address power imbalances, ensure the participation of women, youth, and marginalized groups, and recognize customary land use rights. Mechanisms such as participatory rural appraisal (PRA), community action planning, and benefit-sharing agreements can strengthen ownership and long-term commitment.

Community-based organizations (CBOs) and cooperatives

CBOs and farmer cooperatives act as intermediaries between individuals and external actors. They facilitate collective action, organize training and input distribution, and monitor restoration outcomes at the local level. In many cases, CBOs also manage community forests or water catchments, serving as local governance structures. Beyond these roles, they strengthen the market position of members by aggregating products, ensuring quality standards, and linking producers to buyers. Strengthening their institutional capacity through financial and technical support is therefore key not only to scaling FLR beyond pilot projects but also to enabling sustainable livelihoods through market access.

Local authorities and decentralized governance structures

District and county-level governments have critical responsibilities in land use planning, natural resource management, and service delivery. These authorities are essential for aligning FLR with local development plans, resolving land disputes, and enforcing relevant bylaws and conservation regulations. They also play a facilitative role in linking communities with higher-level institutions and funding opportunities.

An important challenge here lies in limited capacities and resources, particularly in rural and remote areas. FLR initiatives must therefore invest in strengthening local governance through training, budget support, and joint implementation arrangements.

National governments and line ministries

National-level actors, including ministries of environment, forestry, agriculture, and water, are responsible for setting policy frameworks, allocating public resources, and developing national FLR strategies. They define restoration targets, coordinate multi-sectoral efforts, and often host national coordination units for programs like AREECA.

Governments also have a regulatory function, overseeing land tenure systems, forest classifications, and environmental safeguards. Their engagement is crucial to mainstream FLR into broader policy agendas such as climate change adaptation (e.g., NDCs), biodiversity conservation, and sustainable development.

Non-governmental organizations (NGOs) and technical partners

NGOs and international technical partners provide scientific expertise, implementation support, and capacity development. Organizations such as IUCN, FAO, WRI, and GIZ bring tools like the ROAM, remote sensing technologies, and monitoring frameworks. NGOs often act as facilitators and advocates, bridging community-level realities with policy-level dialogue and funding mobilization.

These actors also promote knowledge exchange and learning through platforms and networks, ensuring that restoration efforts are evidence-based and adaptive. However, their role must be carefully balanced to avoid dependency and to ensure that local institutions retain ownership.

Private sector actors

Engaging the private sector in FLR, particularly in value chain development, sustainable land-use financing, and input provision, is increasingly recognized as vital. Agribusinesses, eco-tourism operators, and financial institutions can support restoration through public private partnerships, carbon markets, or green investment mechanisms.

Nevertheless, alignment between private sector goals and local livelihood needs requires robust governance, clear benefit-sharing arrangements, and safeguards to prevent land grabbing or inequitable access.

International donors and multilateral organizations

Donor agencies, development banks, and multilateral bodies play a strategic role in financing and agenda-setting. Their support enables large-scale coordination, transboundary learning, and the integration of FLR into international frameworks such as the Bonn Challenge, AFR100, and the UN Decade on Ecosystem Restoration.

While financial resources are indispensable, it is equally important for donors to support flexible and participatory programming that adapts to local contexts rather than imposing rigid templates.

Communication and coordination mechanisms

Effective stakeholder engagement relies on structured communication channels across all levels. Multi-stakeholder platforms, restoration committees, joint monitoring systems, and digital tools (e.g., dashboards, WhatsApp groups, geospatial portals) enhance transparency, accountability, and shared learning. The challenge remains to translate top-down policy into bottom-up action, and vice versa.

In conclusion, FLR is inherently multi-stakeholder and multi-level. Only through inclusive, coordinated, and transparent engagement across actors (from farmers to ministers) can restoration be effective, equitable, and enduring.

5.2 Community engagement

Community engagement is a foundational element of successful FLR, ensuring that restoration processes are not only ecologically effective but also socially equitable and locally relevant. Unlike passive consultation, community engagement entails a dynamic, iterative process of participation, empowerment, co-creation, and shared stewardship. In FLR, the community is not merely a beneficiary but a co-implementer and co-decision-maker, whose long-term commitment often determines the success or failure of restoration efforts.

The rationale for community engagement in FLR

The rationale for community engagement in restoration is multi-fold. First, local communities are directly affected by land degradation and are thus highly motivated to restore ecosystem services such as soil fertility, water availability, and biodiversity.

Second, community members hold place-based knowledge about local ecology, species performance, climatic patterns, and land use histories, which is crucial for designing context-specific and culturally appropriate interventions. Third, community buy-in reduces the risks of non-compliance, conflict, or abandonment of restored sites once external actors withdraw.

In addition, community engagement reinforces social capital, promotes inclusive governance, and enables livelihood diversification, all of which are important pillars of long-term sustainability.

Degrees of participation

Community engagement can be conceptualized along a continuum of participation:

- **Information and consultation:** Communities are informed or consulted about restoration plans but have limited influence over decisions.
- **Collaboration and partnership:** Community members co-design restoration interventions and share responsibilities for implementation and monitoring.
- **Empowerment and self-governance:** Communities lead restoration processes with full decision-making autonomy, often supported by legal recognition and capacity-building.

FLR programs that aim for genuine transformation should strive toward the higher end of this spectrum, ensuring that communities have agency, voice, and ownership.

Tools and approaches for effective engagement

A range of participatory tools can facilitate meaningful engagement. These include:

- PRA for mapping land uses, ecosystem services, and degradation hotspots.
- Community visioning workshops to articulate restoration goals and trade-offs.
- FFS and demonstration plots to build practical skills and promote peer learning.
- VSLAs and cooperatives to integrate economic incentives.
- Participatory monitoring using tools such as photo documentation, GPS tracking, and community scorecards.

Digital platforms (e.g., mobile-based surveys or SMS feedback systems) can also enhance inclusivity and communication, especially in dispersed or marginalized populations.

Barriers and challenges

Despite widespread recognition of its importance, community engagement in FLR often faces substantial barriers:

- Power asymmetries between stakeholders may marginalize certain groups, especially women, youth, landless individuals, or ethnic minorities.
- Tokenism in engagement processes, where participation is superficial and predetermined decisions are simply presented to communities.
- Resource constraints, such as time, funding, and logistical capacities, may limit the depth and continuity of engagement.
- Lack of legal recognition for customary land rights can undermine community control over restored areas, reducing motivation to invest in long-term care.

To overcome these barriers, FLR practitioners must embed equity considerations from the outset and adopt inclusive facilitation techniques.

Incentivizing participation

Community engagement must also consider the cost-benefit balance from the perspective of local stakeholders. Restoration often requires short-

term labour and opportunity costs, with ecological benefits accruing only in the medium to long term. Providing short-term incentives like PES, access to non-timber forest products, or livelihood training, can bridge this gap.

Equally important are non-material incentives, such as improved recognition, stronger community cohesion, and enhanced tenure security. Programs that acknowledge these social dimensions are more likely to foster sustained engagement.

Community engagement in monitoring and evaluation

M&E is often dominated by technical experts, yet involving communities in M&E improves transparency, accountability, and local learning. Participatory monitoring not only captures local perspectives but also builds community skills in ecological assessment and adaptive management.

Indicators may include not just biophysical metrics (e.g., tree survival, soil cover), but also social and governance outcomes like trust in institutions, satisfaction with benefit-sharing, and perceived changes in wellbeing.

Toward transformational engagement

Ultimately, community engagement in FLR should not be treated as an isolated activity but as a transformational process embedded within broader efforts toward social equity, ecological justice, and sustainable development. By recognizing communities as active rights-holders and agents of change, FLR can evolve from a technocratic exercise into a socially rooted movement for landscape renewal.

5.3 Value chain development

Value chain development plays an increasingly important role in FLR by linking ecological restoration with sustainable economic benefits. When successful, it can enhance local livelihoods, incentivize stewardship of restored landscapes, and contribute to long-term sustainability. However, establishing viable value chains within FLR projects is a complex and resource-intensive undertaking. It requires significant investment in time, coordination, capacity building, infrastructure, and market systems. If integrated into an FLR program, value chain development must be treated as a major programmatic component and receive a corresponding share of financial and human resources.

One of the main challenges is the long-time horizon required. Value chains do not emerge organically over short project cycles. Instead, they require multiple stages of investment, from the identification of promising products to market research, stakeholder organization, quality control, branding, and policy alignment. Building trust with producers, developing standards, and securing reliable buyers are processes that typically take years. For this reason, FLR programs that incorporate value chains must begin planning early, align with existing market systems, and secure long-term commitments from stakeholders and funders.

Certain preconditions must be in place for value chain development to be feasible. These include secure and equitable access to land and resources (especially for women and marginalized groups); reliable infrastructure (roads, storage, electricity); basic technical knowledge among producers; and access to finance or startup capital. Without these foundations, even well-intentioned market initiatives can exacerbate inequality or lead to failure. Institutional coordination is also essential, as value chains involve a broad spectrum of actors: producers, processors, traders, service providers, cooperatives, government agencies, and often private investors.

Developing a value chain typically follows a stepwise approach:

- **Product identification**: Based on ecological suitability, community preference, and market demand. Restoration-compatible products include timber, fruits, nuts, medicinal plants, resins, honey, and fibres.

- **Feasibility assessment**: Includes market analysis, profitability studies, environmental -sustainability checks, and risk analysis.

- **Stakeholder organization**: Establishing producer groups or cooperatives is crucial for achieving economies of scale, ensuring quality control, and accessing training or finance.

- **Capacity development:** Training in production, harvesting, processing, storage, and business skills must be tailored to local needs and delivered through ongoing support.

- **Market linkages:** Connecting producers to local, national, or export markets through partnerships with buyers, fair trade organizations, or digital platforms.

- **Governance and regulation:** Developing certification schemes, benefit-sharing models, and conflict-resolution mechanisms is key to maintaining transparency and fairness.

Within the AREECA countries, several value chain opportunities are particularly relevant and aligned with restoration goals:

- **Cameroon (West Bamboutos):** High-value timber species (e.g. Prunus africana), coffee and spice agroforestry (e.g. ginger, turmeric), and fruit tree production (e.g. avocado, mango) are key opportunities. However, they require coordinated management due to terrain and land tenure complexities.

- **Kenya (Loitokitok/Amboseli):** Sustainable charcoal production from managed woodlots, aloe vera and essential oils from drought-tolerant species, and honey production are promising. Ecotourism and wildlife-based value chains could also be revived through connectivity restoration.

- **Malawi (Ntcheu region):** Beekeeping, mushroom cultivation, and fish farming have strong potential. These require relatively low land input and offer quick returns, particularly when integrated with reforestation or agroforestry systems.

- **Rwanda (Kirehe, Nyagatare):** Agroforestry systems with fruit trees (e.g. papaya, citrus), fodder production for livestock, and medicinal plants hold potential. Integration with local processing and storage units could reduce post-harvest loss and increase income.

Ultimately, value chain development should not be seen merely as an add-on to ecological restoration, but as a systemic intervention that demands long-term vision, strategic investment, and inclusive governance. When done right, it can transform restored landscapes into thriving socio-ecological systems that generate not only environmental benefits but also durable economic opportunities.

5.4 Private sector involvement

The engagement of the private sector in FLR is increasingly recognized as essential for achieving scale, innovation, and sustainability. While FLR has traditionally been driven by public and civil society actors, private entities (from local entrepreneurs and agribusinesses to multinational corporations and impact investors) bring critical resources, market access, technical expertise, and long-term investment potential and consequently sustainability. Their involvement, however, requires careful structuring to align commercial interests with ecological integrity and social equity.

Private sector engagement in FLR can take diverse forms. These include co-financing of restoration activities, sourcing of raw materials from restored landscapes (sustainable sourcing landscapes), development of green infrastructure (e.g. nurseries, processing facilities), provision of inputs (seeds, tools, finance), and participation in carbon markets or certification schemes. Crucially, the private sector can also act as a market enabler, facilitating the commercialization of restoration-compatible value chains and linking producers to domestic or international buyers.

Fruit tree seedling protected by artificial structure and supplied with bottle drip irrigation.

However, integrating private actors into restoration efforts is not without challenges. FLR landscapes are often in marginalized regions with poor infrastructure, insecure tenure, fragmented governance, and limited market access. These conditions may deter investment or lead to predatory behaviour if appropriate safeguards are not in place. Therefore, responsible private sector engagement must be governed by principles of transparency, inclusivity, and sustainability.

Several prerequisites increase the likelihood of successful private sector participation in FLR:

- Clear land and resource tenure, especially for communities and smallholders
- Enabling policy frameworks that incentivize green investment
- Risk mitigation tools (e.g., guarantees, blended finance)
- Availability of technical data (e.g., site potential, biomass productivity, ecosystem services)
- Platforms for dialogue between communities, governments, and business
- Strong legal framework ensuring save investment environment

Public actors play a key role in de-risking private investment. This can be achieved through co-funding mechanisms, tax incentives, concessional loans, or PES schemes. Donor-funded programs can also support demonstration projects that build investor confidence by showing that restoration can generate tangible returns.

Private sector engagement should be guided by a landscape approach, recognizing the interdependence of economic, social, and ecological systems. Rather than treating FLR as a standalone intervention, companies should see restoration as means to secure their core business, integrate restoration into their broader land-use strategies, corporate sustainability commitments, and supply chain policies. Partnerships with civil society and research institutions can help businesses navigate environmental

and social complexities while strengthening their accountability.

In the AREECA countries, specific opportunities for private sector involvement include:

- In Malawi, agribusiness firms and microfinance institutions can support inputs and marketing for smallholder-based mushroom, honey, and aquaculture ventures.
- In Kenya, ecotourism companies and essential oil producers have strong incentives to invest in landscape restoration around Amboseli, enhancing biodiversity and scenic value while developing niche markets.
- In Cameroon, coffee cooperatives and timber certification bodies can integrate reforestation and sustainable forest management into export-oriented value chains.
- In Rwanda, agro-processors and dairy companies have a stake in restoring fodder systems, reducing erosion, and improving upstream watershed functions in districts like Nyagatare.

To ensure accountability, FLR initiatives should include monitoring frameworks that track private sector contributions and impacts, using environmental, social, and governance indicators. Voluntary standards (e.g. FSC, Rainforest Alliance, or the Verified Carbon Standard) can provide guidance and credibility but must be complemented by robust national legislation and their enforcement.

Ultimately, the private sector is not a panacea for restoration challenges. Yet, when mobilized responsibly and in partnership with local stakeholders, it can unlock financing, innovation, and long-term value creation that would otherwise be difficult to achieve. The key lies in building trust, aligning incentives, and embedding restoration within broader models of sustainable and inclusive rural development.

5.5 Livelihood options

Integrating livelihood options into FLR is vital to ensure the long-term viability and acceptance of restoration interventions, particularly in contexts where poverty, food insecurity, and land degradation are closely interlinked. In the AREECA countries restoration efforts are not only about recovering ecosystems, but also about enhancing human wellbeing and diversifying income sources for rural populations.

Livelihoods and restoration are mutually reinforcing. Restored landscapes provide ecosystem goods and services (fuelwood, fodder, fruits, timber, water regulation, and improved soils) that underpin agricultural productivity and resilience. In turn, viable livelihood alternatives reduce pressure on degraded land, making restoration outcomes more sustainable.

In Malawi, the integration of livelihoods into FLR is especially crucial due to the high levels of chronic food insecurity and dependence on subsistence agriculture. Land degradation in areas like Ntcheu threatens crop yields and household nutrition, creating a cycle of poverty and environmental decline. As part of the AREECA initiative, the FAO integrated livelihood support directly into restoration interventions. One key example is the distribution of goats to selected households. These animals not only provide meat and milk, thus improving dietary diversity and nutritional status, but also generate manure for soil fertility management and can be sold for cash income. Such interventions directly link restoration (e.g., improved pasture, agroforestry systems) to food and income security.

In Kenya, particularly in the semi-arid areas around Loitokitok and Amboseli, livelihoods are often centred around pastoralism and small-scale agriculture. Climate variability and land fragmentation pose major risks to income stability. FLR interventions here support agro-pastoral systems, including the establishment of fodder banks, restoration of degraded grazing lands, and introduction of drought-tolerant

crops and trees. These not only stabilize ecosystems but also buffer communities against the impacts of drought and market fluctuations. Beekeeping and the cultivation of high-value plants like aloe also offer viable supplementary livelihoods that are ecologically compatible with restoration.

In Cameroon, the Western Highlands (e.g., West Bamboutos) are densely populated and agriculturally productive but suffer from soil erosion, deforestation, and reduced fallow periods. Here, restoration is combined with high-value agroforestry systems, such as intercropping coffee or cocoa with native shade trees. These systems generate cash income while maintaining soil cover, enhancing biodiversity, and supporting carbon sequestration. Additionally, the cultivation of medicinal plants and spices (e.g., turmeric, ginger) for local and export markets offers income diversification with relatively low environmental impact.

In Rwanda, particularly in Eastern districts like Kirehe and Nyagatare, livestock rearing and crop farming are predominant. However, land degradation and water scarcity are major constraints. Livelihood-focused FLR activities include fruit tree planting (e.g., citrus, mango) in agroforestry systems, fodder grass establishment, and promotion of kitchen gardens for improved household nutrition. In many areas, restoration is tied to broader land husbandry programs that include terracing, composting, and rainwater harvesting measures that boost both ecological function and agricultural productivity.

To ensure success, livelihood components in FLR must be locally tailored, gender-sensitive, and market-aware. They should also be accompanied by training, input provision, and access to credit or savings groups. Participatory approaches are essential to identify livelihood priorities and ensure community ownership.

Moreover, integrating short-term benefits (e.g., animal husbandry, food crops, non-timber products) alongside long-term ecological goals (e.g., reforestation, soil regeneration) helps bridge the incentive gap often present in restoration programs. This is particularly important in contexts where day-to-day survival outweighs long-term environmental concerns.

In conclusion, livelihoods are not a peripheral concern in FLR; they are central. Without secure, diversified, and restoration-compatible livelihoods, the incentives for communities to protect restored landscapes diminish. By embedding livelihoods into the core design of FLR, as seen across the AREECA countries, restoration becomes not only a tool for environmental repair, but also a vehicle for social and economic transformation.

Improved goat shelter to reduce overgrazing and established alternative livelihood opportunities not threatening the restoration success

Ex ACT training in Cameroon

5.6 Capacity development

5.6.1 Regional capacity development

5.6.1.1 Monitoring accelerator

Many of the AREECA countries have begun to put in place the right foundations, developing policies, integrating restoration into national plans, and testing innovative finance mechanisms. However, one critical barrier remains: most countries still lack reliable and consistent data to assess restoration progress. Monitoring systems are fragmented, underfunded, or absent altogether. Without timely and credible information, governments cannot showcase their achievements, attract new investment, or make sound, evidence-based decisions.

The LMA was established to address this challenge. The first LMA was held in Nairobi, Kenya, in 2023, bringing together leaders and practitioners from Kenya, Rwanda, Malawi, Cameroon, and Ethiopia. This initial cohort set the foundation for a collaborative approach to restoration monitoring, demonstrating the power of technical mentorship and peer learning in strengthening national systems.

Building on this success, the 2025 LMA was expanded to 13 countries and continues to equip countries with practical tools and institutional capacity to design, implement, and sustain effective monitoring systems. By generating credible data, countries can track progress, meet AFR100 and international re-

porting obligations, and build trust among citizens, peers, and investors.

Tailored to both policymakers and technical practitioners, the LMA balances strategic oversight with practical implementation. It provides a results-driven framework that saves time, fosters collaboration, and builds confidence in the integrity of restoration data. Ultimately, the LMA helps countries move from ambition to action, ensuring that Africa's restoration commitments deliver on their promise of ecological renewal, economic opportunity, and global impact.

5.6.1.2 Carbon balance

Country teams and government representatives (including AFR100 focal points) participated in a series of capacity development sessions on estimating carbon balance in result of the restoration activities carried out in each of the countries in the framework of the project. These series of workshops allowed country teams to learn how to use the FAO tool EX-ACT, a GHG accounting tool for estimating the carbon balance in the AFOLU1 sector. It can be applied throughout the project lifecycle and derives a carbon balance as the difference of a scenario with and without project activities. Through tailored hands-on exercises, participants successfully conducted carbon balance appraisals and practiced real-world data collection, reinforcing their understanding of GHG accounting in restoration activities.

The workshops enabled dialogue and exchanges across countries, allowing participants to align common approaches tailored to FLR priorities within the AREECA project. A harmonized monitoring approach for GHG accounting, emphasizing the use of standardized EX-ACT modules and consistent characterization of FLR interventions, was presented to participants. This approach aims to simplify data entry and ensure consistency across countries when assessing the climate benefits of restoration efforts. Participants were also guided on the use of detailed national or project-level data, and on accessing external platforms such as FRA, FAOSTAT and EarthMap to refine their analyses.

Practical sessions covered key land-use sectors including land-use changes, forest rehabilitation, cropland and grassland management, enabling participants to translate real project data into EX-ACT logic effectively. Participants successfully understood the logic of the tool, the data requirements, and the characterization of the FLR interventions. Feedback from participants highlighted the value of using real case studies and the interactive format of the training. However, some challenges were noted, particularly around the availability and consistency of reliable field-data, emphasizing the need for clearer guidance and support in field-data collection.

As a follow-up, a support plan was developed to help address these data challenges, including common guidance on how to represent restoration activities within EX-ACT. Continued technical assistance and review of carbon balance reports helped ensure consistent implementation across AREECA countries. The workshops demonstrated strong participant engagement and proactiveness in applying the EX-ACT tool to their specific project contexts.

5.6.1.3 Indicators and socio-economic data collection

This regional training offered a valuable opportunity for country teams to exchange knowledge and learn about planning and data collection for FLR monitoring. It brought together participants from Kenya, Malawi and Rwanda, fostering collaborative learning, sharing expertise and strengthening regional knowledge dynamics.

Several tools were introduced to support the selection of indicators to monitor restoration, and the socio-economic data collection:

- AURORA: Jointly developed by FAO and WRI, this decision-support tool helps stakeholders create tailored monitoring systems by guiding them in selecting context-appropriate indicators and metrics aligned with their restoration goals.

- Collect: developed under FAO's Open Foris initiative, these free, open-source tools are designed for field data collection (both geospatial and non-geospatial) offering flexibility in survey design and fieldwork.

- KoboToolbox: A widely used open-source platform developed by the Kobo nonprofit organization, KoboToolbox supports data collection, management, and visualization for projects in humanitarian response, development, environmental protection, and human rights.

Key Takeaways and Recommendations:

- High participant satisfaction: Across modules, participants appreciated the practical, hands-on nature of the training and reported significant knowledge gains.

- Tool usability: KoboToolbox was favoured for its user-friendliness, while Open Foris Collect offered robust options for more experienced users.

- Application in future work: Participants expressed a strong intent to apply both AURORA and socio-economic data tools in their respective projects.

Recommendations:

- Include real-world case studies and field visits.

- Allocate more time for data analysis and reporting components.

- Provide additional examples, particularly for more complex tool features (e.g., AURORA's comprehensiveness assessment).

This five-day workshop successfully deepened participants' capacity to monitor FLR initiatives through tailored tools and methodologies. The enthusiasm and engagement demonstrated by participants reflect a growing regional commitment to effective, data-driven restoration practices. There is a clear demand for continued training, particularly in advanced topics like data analysis and reporting, highlighting the need for sustained support to further empower restoration practitioners.

5.6.2 National capacity development

National Capacity Development

Strengthening national capacity is a critical pillar of sustainable FLR. In the context of the AREECA programme and broader landscape restoration efforts, national capacity development refers to the systematic empowerment of government institutions, agencies, and technical staff to independently plan, implement, monitor, and scale FLR interventions. This dimension of capacity building is essential not only for achieving national restoration targets, but also for ensuring the continuity and institutionalization of restoration processes beyond the duration of externally funded projects.

A core objective of national capacity development is to embed FLR within formal governance and policy frameworks, rather than treating it as a temporary, donor-driven initiative. This involves strengthening the ability of relevant ministries, responsible for environment, forestry, agriculture, water, and land, to assume leadership and coordination roles. It also includes supporting cross-sectoral collaboration, as FLR typically sits at the intersection of environmental sustainability, rural development, and climate resilience.

One of the most important instruments for institutionalizing FLR at the national level is the establishment or reinforcement of multi-stakeholder steering committees or coordination platforms. These bodies, often chaired by a relevant ministry and composed of representatives from civil society, research institutions, and private sector actors, provide strategic oversight, facilitate information flow, and ensure alignment between different FLR initiatives. They can also serve as the national contact point for international commitments such as the Bonn Challenge or AFR100.

In addition to institutional mechanisms, targeted technical training is essential for building operational capacity within national agencies. FLR requires a broad range of technical competencies. From eco-

system assessment and species selection to monitoring and evaluation.

In this regard, AREECA and its partners supported training courses on:

- GIS and remote sensing, enabling government staff to map degradation, plan interventions, and monitor progress with spatial accuracy.
- Restoration opportunity assessment methods, such as ROAM for identifying and prioritizing areas for intervention.
- Data management and reporting systems, to support consistent monitoring of biophysical and socio-economic indicators.
- Participatory planning approaches, enabling staff to engage effectively with communities and integrate local knowledge into restoration design.

Such training should not be seen as one-off activities but rather as part of long-term institutional learning pathways. Building a cadre of well-trained professionals within key ministries and agencies ensures that restoration knowledge is retained and applied beyond individual projects or personnel changes.

Another important aspect of national capacity development is the mainstreaming of FLR into national development plans, climate strategies (e.g., NDCs), and sectoral policies. This strategic integration helps secure national budget allocations, improves policy coherence, and facilitates access to climate and biodiversity finance mechanisms like the GCF or the GEF.

Finally, national capacity development is intimately tied to the exit strategy of restoration programs. A successful exit does not mean withdrawal, but transition; from external facilitation to nationally driven implementation. This transition is only viable when national institutions have the vision, structures, skills, and resources to continue and scale restoration efforts on their own terms. Support for capacity development, therefore, must begin early in the project cycle and be reinforced throughout implementation.

In conclusion, national capacity development is not a technical add-on, but a strategic investment in governance, sovereignty, and sustainability. By equipping national actors with the tools and authority to lead, FLR becomes more than a project. It has become a national agenda for environmental restoration and rural transformation.

5.6.3 Beneficiary capacity development

Beneficiary Capacity Development

Empowering direct land users (smallholder farmers, pastoralists, women's groups, youth cooperatives, and other community-based actors) is indispensable for FLR to move from plans on paper to thriving vegetation on the ground. Beneficiary capacity development in AREECA therefore focused on hands-on, technical training that equips local people with the skills, tools, and confidence to implement, maintain, and adapt restoration practices under real-world conditions.

A unifying design principle has been contextualization. Trainings were tailored to the biophysical setting, livelihood systems, and cultural norms of each target landscape. Modules delivered on a terraced hillside in Rwanda's Eastern Province differed in emphasis and language from those held in the semi-arid plains around Kenya's Amboseli or the miombo woodlands of Malawi. Local examples, vernacular terminology, and participatory demonstrations ensured that techniques felt relevant, feasible, and worth adopting.

Across the four countries, capacity-building covered every intervention type promoted by the programme:

- Tree nursery management and species selection: from seed collection and pre-treatment to potting media, shading, watering, and out-planting schedules.

- ANR: identifying desirable seedlings, selective thinning, coppice management, and fire control.
- Agroforestry design: optimal spacing, pruning regimes, grafting of fruit trees, and integration of fodder shrubs.
- Soil and water conservation: contour bunds, infiltration ditches, micro-basins, and bioengineering with vetiver or bamboo.
- River- and streambank rehabilitation: live staking, riparian buffer zoning, and maintenance protocols.
- Recognizing the need for income diversification and short-term incentives, the programme also offers training in complementary (non-FLR) livelihood skills tightly linked to restored landscapes:
- Beekeeping: hive construction with locally available materials, colony management, disease control, and honey value addition.
- Mushroom cultivation: substrate preparation, spawn inoculation, hygiene standards, and post-harvest handling.
- Small-scale aquaculture and fish farming in rehabilitated ponds or irrigation schemes.
- Goat husbandry (notably in Malawi) to enhance household nutrition and generate manure for agroforestry plots.

Delivery methods combined farmer field schools, demonstration plots, mobile on-site clinics, and peer-to-peer exchange visits. Technical manuals and quick-reference pictorial guides have been translated into local languages, and digital extension, via SMS alerts or WhatsApp groups, reinforced key messages between seasons. A "training-of-trainers" cascade is ensuring that knowledge circulated and is still circulating beyond the initial cohorts, multiplying impact while reducing long-term external facilitation costs.

Crucially, beneficiary capacity development was embedded within the broader monitoring and learning framework. Participants helped define success indicators (e.g., seedling survival rates, honey yield per hive), kept simple records, and engaged in seasonal review meetings. Such an iterative approach not only builds technical competence but also fosters a culture of adaptive management in which farmers continuously refine practices to local feedback and changing climatic conditions.

By providing practical, context-specific, and demand-driven training across the full spectrum of FLR interventions, as well as allied livelihood activities, AREECA strengthened community agency and ensured that restored landscapes deliver tangible, lasting benefits.

5.7 Monitoring

Monitoring is a fundamental pillar of FLR. It provides the evidence base for evaluating progress, learning from implementation, and adapting strategies to changing conditions. Without robust monitoring systems, restoration risks becoming a well-intentioned but opaque process; disconnected from its ecological, social, and economic objectives. In the context of AREECA and broader FLR efforts, monitoring serves not only to assess whether trees survive, but also whether landscapes are functioning better, communities are benefiting, and institutions are learning.

The rationale for monitoring is multifaceted. First and foremost, FLR is a long-term process. Trees take years to mature, ecosystem services regenerate gradually, and socio-economic outcomes evolve over time. Monitoring enables temporal continuity, tracking changes beyond the typical project cycle and thus ensuring accountability for restoration commitments. This is particularly relevant in countries that have pledged restoration targets under frameworks such as the Bonn Challenge, AFR100, or their NDCs.

Secondly, monitoring helps answer the critical question: "Is restoration working?" This includes biophysical parameters (e.g., vegetation cover, soil stability, water infiltration), socio-economic metrics (e.g., income diversification, food security, land tenure security), and institutional indicators (e.g., policy uptake, stakeholder coordination). A monitoring system that integrates these dimensions offers a more complete picture of FLR performance and supports evidence-based decision-making at all levels.

Third, monitoring fosters adaptive management. Restoration is rarely linear; it involves uncertainties, setbacks, and trade-offs. Well-designed monitoring allows implementers to detect problems early (low seedling survival, erosion recurrence, or conflicts over land use) and adjust interventions accordingly. In this sense, monitoring is not only evaluative but also diagnostic and iterative.

Monitoring also enhances transparency and trust among stakeholders. Communities, governments, donors, and technical partners all need access to timely and credible information about what has been done, what is changing, and what remains to be addressed. Inclusive monitoring processes, where data is collected, validated, and interpreted collaboratively, can strengthen local ownership, clarify roles, and reduce tensions over resource use or benefit-sharing.

Lastly, monitoring is indispensable for learning and scaling. Restoration landscapes serve as living laboratories. Systematic tracking of outcomes allows for comparison across contexts, extraction of best practices, and generation of knowledge that can inform policies, investment decisions, and training materials. Monitoring thus becomes a catalyst for replication.

In summary, monitoring in FLR is an enabling condition for effective, equitable, and enduring restoration. It transforms restoration from a hopeful act into a measurable process, capable of delivering real benefits for people, nature, and climate.

5.7.1 Categorization, Coding, Data Integration and Data management

For monitoring in FLR to be meaningful and verifiable, it must be underpinned by a coherent data architecture, a system that not only captures field-level activities but also allows for transparent aggregation, spatial analysis, and quality control. A key foundation for this is the categorization of restoration interventions into clearly defined FLR activity types. Each activity, whether it is tree planting, ANR, agroforestry, erosion control, or riverbank rehabilitation, must be systematically grouped into an agreed-upon FLR category.

These categories serve multiple purposes. They allow for standardized reporting across countries and partners; they make it possible to track the extent and intensity of different restoration strategies; and they enable stakeholders to distinguish between ecological functions (e.g., biodiversity recovery, water regulation, carbon sequestration) linked to specific intervention types. Without such structuring, restoration efforts become fragmented and analytically opaque undermining the ability to report meaningfully at the programme or policy level.

To operate this system, each intervention area must be uniquely coded. This coding is essential for linking the physical interventions recorded in the field with their corresponding spatial representations in GIS shapefiles and centralized databases. Unique codes typically combine identifiers such as country, region, site, year, implementing partner, and FLR category. These codes ensure that every recorded hectare of restoration can be precisely located, traced to its origin, and verified independently.

This integration between field data, GIS layers, and database records forms the backbone of a credible monitoring system. It allows for automated analysis (e.g., aggregation of hectares by FLR category, land cover change detection), supports the generation of progress dashboards and reports, and makes data auditable for external reviewers and funding agencies. It also provides a mechanism for verifying

restoration claims, preventing double counting, and enhancing accountability across the consortium.

Within AREECA, this system was introduced relatively late in the implementation process, following initial challenges with data harmonization and inconsistencies in how activities were reported. Before the standardized FLR categorization and coding system was adopted, different partners used varying definitions and formats, which made cross-country comparison and aggregation difficult. The absence of a unified spatial referencing system also limited the utility of GIS tools and hampered quality assurance.

Since the introduction of this structured monitoring framework, however, data quality and coordination improved markedly. All partners reported their interventions using the same set of categories and coding protocols. Field data was submitted alongside geospatial files that are pre-linked via unique codes, enabling seamless validation and integration into the central monitoring platform. This not only enhanced internal data coherence but also fostered a stronger sense of collaborative ownership across the consortium.

Beyond technical improvements, this system also improved transparency and credibility. External reviewers and auditors can now follow the full data chain: from field forms and photos to maps and summary statistics. Thus, verifying that reported results reflect traceable activities on the ground.

In conclusion, the creation of FLR categories and the application of a coding system are strategic enablers of verifiable, high-quality monitoring. They create a common language among partners, link field and spatial data, and build the foundation for robust learning, reporting, and accountability in FLR.

5.7.2 Data Sources, Collection Methods, and Verification in FLR Monitoring

Effective monitoring in FLR relies on a combination of data sources and collection methods that together provide a comprehensive, credible, and scalable picture of restoration progress. Within AREECA, a multi-tiered monitoring approach was adopted, combining quantitative biophysical data, geospatial analysis, participatory inputs, and external verification. Each layer contributed a different perspective, and together they formed a robust system capable of serving both internal learning needs and external accountability demands.

At the core of the system were field-based data collection tools, used by implementing partners, local facilitators, and trained enumerators.

These tools captured critical variables such as:

- Type and size of intervention (linked to the FLR categories and coded accordingly)
- GPS coordinates or polygon shapefiles of intervention areas
- Species planted or managed, including survival rates and maintenance activities
- Land tenure arrangements and implementing stakeholders

In parallel, remote sensing and GIS-based monitoring offered a synoptic view of land cover change, tree canopy development, and landscape-level dynamics. Satellite imagery (e.g., from Sentinel-2 or Landsat), drone surveys, and UAV-based photogrammetry were used to detect vegetation regrowth, erosion control impacts, and structural changes over time. These geospatial tools complemented field data by providing independent, repeatable, and scalable assessments that are not limited to plot-level observations.

Drone used for degradation mapping and restoration monitoring in Malawi

A unique strength of the AREECA approach was the incorporation of community-based monitoring. Local stakeholders were not just passive data providers but active participants in defining indicators, collecting information, and interpreting results. For example, farmers trained through FLR interventions may have kept logbooks of planting dates, inputs applied, and survival rates. Community members may have participated in seasonal vegetation surveys, soil erosion assessments, or participatory mapping exercises. These efforts enhanced local ownership, fostered transparency, and provided valuable qualitative insights that formal metrics might miss.

Moreover, this bottom-up perspective helped validate top-down data, creating a feedback loop between scientific and experiential knowledge. In contexts with limited internet access or literacy, visual monitoring tools (e.g., photographic time series, participatory ranking) also proved effective.

To ensure data integrity and credibility, verification mechanisms were essential. These included:

- Cross-checks between field data and GIS shapefiles, facilitated by the unique coding system
- Random spot checks and re-visits conducted by supervisors or independent reviewers
- Third-party audits commissioned for selected sites to verify reported outcomes against actual biophysical conditions
- In addition, a shared data quality protocol defined minimum standards for accuracy, completeness, consistency, and timeliness across all partners. This protocol was regularly updated and jointly reviewed during the bi-weekly monitoring task force meeting.

Ultimately, the value of monitoring lies not just in data collection but in its use for learning and adaptation. Within AREECA, monitoring results fed directly into annual planning, identified training needs, guided budget allocations, and informed scaling decisions. They also contributed to national reporting systems and global restoration databases, ensuring alignment with wider policy goals.

In summary, the combination of field data, remote sensing, community inputs, and robust verification made the FLR monitoring system in AREECA both technically rigorous and socially grounded. This layered approach enhanced not only the quality of information, but also its legitimacy in the eyes of all stakeholders.

5.8 Communication strategies

The AREECA Communication Strategy, approved in 2021, provided a common framework for how project partners communicate internally and externally, ensuring visibility, coherence, and impact across all partners.

The strategy focused on four main objectives:

- **Generating awareness of the global and regional FLR movement:** Through targeted campaigns, factsheets, and media outreach, AREECA raised awareness of restoration priorities and achievements.

- **Promoting dialogue among local, national, regional, and international stakeholders:** Multi-level exchanges were facilitated through workshops, stakeholder forums, and joint field visits. Lessons learned highlight the importance of using existing local mechanisms, such as district forest committees and farmer cooperatives, to ensure meaningful participation. At the national level, collaboration with ministries and regulatory agencies helped translate local experiences into national FLR strategies. Consistent follow-up and feedback loops were essential to sustain engagement and build trust.

- **Capacity development and knowledge management:** Technical exchanges, webinars, and accessible knowledge products enabled partner organizations to share lessons, best practices, and innovative approaches across countries.

- **Generating evidence on ecological and economic benefits:** Documentation of restoration outcomes strengthened policy and financial support for FLR initiatives.

Target groups included AREECA partners, the wider FLR community, BMUKN/IKI, and political decision-makers. Tailored tools and channels like websites, factsheets, conferences, films, and knowledge platforms such as AFR100 and PANORAMA helped reach these groups effectively. A visual identity and branding package (logo, templates, design guidelines) ensured coherent and recognizable communication.

Internally, coordination structures such as working groups, steering committees, and regular jour fixes aligned communication and knowledge sharing across countries. Externally, partners actively used their own channels, particularly social media, to promote achievements and success stories, amplifying AREECA's visibility and outreach.

5.9 Policy harmonization

AREECA has played an important role in advancing policy harmonization for FLR across its focus countries. In Malawi, comprehensive policy harmonization reports were produced, assessing over 40 policies, strategies, and laws across forestry, agriculture, water, biodiversity, and climate change. These analyses highlighted both the strengths of Malawi's FLR-supportive legal framework and critical gaps, including conflicts between centralized forestry laws and decentralized governance structures, as well as weak responses to invasive alien species. The harmonization work provided concrete recommendations to align conflicting policies, strengthen cross-sectoral governance, and promote sustainable financing mechanisms, thereby laying a stronger foundation for upscaling restoration.

In Rwanda, AREECA supported the formulation and adoption of several important frameworks. A feasibility study on the CECF was finalized in 2023, and the Rwanda Forestry Authority is actively promoting this financing mechanism to channel resources into community-driven restoration. At the policy level, two sector guidelines were validated and published: one on urban forestry and roadside plantations, providing technical direction to integrate trees and green spaces into infrastructure and city planning, and another on a community approach to restoration, emphasizing participatory methods and local ownership. Together, these measures strengthen Rwanda's enabling environment by combining financial innovation with technical and

community-oriented guidance, ensuring restoration becomes embedded in both national planning and local implementation.

At the national level in Kenya, AREECA, with support of the TRI supported the harmonization of the FOLAREP with the government's 15 Billion Trees Strategy, ensuring that large-scale restoration targets are embedded into coherent frameworks. On a sub-national level, the programme supported revisions of the climate change bill and policy, which were updated to better address emerging FLR needs and integrate restoration into broader climate governance. This dual engagement at both national and county levels enhances Kenya's capacity to mainstream restoration across planning, implementation, and financing structures.

5.10 Exit strategy

5.10.1 Sustainable measures for long term success

A central component of AREECA's exit strategy was the establishment of measures that ensure restoration outcomes persist beyond the project's duration. Sustainability was addressed on four levels: ecological, economic, institutional, and social. Ecologically, interventions emphasized the use of native and climate-resilient species, SWC techniques, and agroforestry systems that improve long-term land productivity. Institutionally, the project invested in capacity development of local government structures, community-based organizations, and forest user groups, enabling them to plan, monitor, and enforce restoration independently. Social sustainability was reinforced through incentive-based mechanisms, such as community conservation funds and livelihood diversification, which reduce dependency on unsustainable practices. By embedding restoration into national policy frameworks (e.g., National Forest Landscape Restoration Strategies and AFR100 commitments), AREECA ensured alignment with broader development agendas. Economically, restoration measures linked to and aligned with private sector business models are there to stay as long as the business approach is viable. This multi-layered approach increases the likelihood that restored landscapes remain functional and that benefits continue to accrue for local communities and ecosystems.

5.10.2 Process handover to local partners

The exit strategy was also defined by a systematic process of handover to local partners. Throughout implementation, AREECA placed emphasis on participatory planning, ensuring that communities, traditional authorities, and local governments were not passive beneficiaries but active co-implementers. This was operationalized through joint management plans, signed agreements (e.g., co-management of forest reserves in Malawi), and the formal recognition of community governance structures (e.g., sacred forest conventions in Cameroon). Knowledge transfer was achieved through training programmes, exchange visits and the institutionalization of multi-stakeholder platforms, where roles and responsibilities were clearly distributed. The handover process also included strengthening the role of national research institutes and universities to continue monitoring, providing technical advice, and generating evidence. This approach fostered local ownership and reduceed dependency on external actors, ensuring that interventions were embedded in community practices and national systems.

5.10.3 Financing mechanisms

A critical dimension of the exit strategy concerns the financial sustainability of restoration efforts. AREECA piloted and tested diverse financing mechanisms that can be scaled or replicated after the project ends. These include community-based funds, such as Rwanda's CECF, which ties conservation compliance to microfinance access, and the establishment of savings and credit cooperatives that reinvest part of their revenues into restoration. At the institutional level, AREECA facilitated the integration of FLR

into public sector budgets, ensuring that restoration is recognized as part of national development planning and eligible for domestic funding streams. Moreover, the project actively engaged the private sector, mobilizing corporate contributions through reforestation partnerships and linking businesses to restoration value chains (e.g., timber, non-timber forest products, and water services). At the regional scale, AREECA contributed to discussions on Finance and Restoration Hubs under AUDA-NEPAD and ECOWAS aiming to harmonize standards and connect restoration with climate and biodiversity finance. By diversifying financial sources, AREECA laid the foundation for long-term investment in restored landscapes that does not rely exclusively on international donors.

6
Contextualization of FLR interventions

6.1
Cameroon

FLR in Cameroon under AREECA had to respond to a highly complex socio-ecological setting. The country's landscapes are characterized by a mosaic of dense tropical forests, savanna margins, and intensively farmed agricultural zones. The principal drivers of degradation (e.g. shifting cultivation, expansion of cocoa plantations, and unsustainable logging) are deeply rooted in rural livelihoods and land use systems. Any restoration approach therefore required not only ecological techniques but also strong attention to customary practices, cultural values, and governance frameworks.

Contextual Drivers of Degradation

Cameroon's forest margins face strong pressures from shifting cultivation. Farmers often clear patches of forest, cultivate them for a few years, and then abandon them once soil fertility declines. Without sufficient fallow time, these areas degrade rapidly into secondary bush dominated by low-value species. Cocoa production adds another layer of degradation, with farmers expanding plantations into forest edges, often removing shade trees to maximize yields. Logging, both legal and illegal, further exacerbates fragmentation and undermines regeneration. Together these practices have led to habitat loss, soil depletion, and declining ecosystem services such as water regulation and biodiversity provision.

Integration of Cultural Practices

A distinctive feature of FLR in Cameroon is the recognition of sacred forests. These forest patches, historically protected for spiritual and cultural reasons, have functioned as de facto conservation areas for centuries. Communities traditionally have restricted extraction, creating reservoirs of biodiversity and seed sources for surrounding landscapes. However, these customary systems have been weakened by demographic pressure, land scarcity, and declining respect for traditional authorities. AREECA sought to revitalize these cultural practices by formalizing community rules through local conventions. By giving legal recognition to customary governance, communities were empowered to protect and manage sacred forests in a way that harmonizes cultural heritage with modern environmental governance.

Technical Restoration Measures

Beyond governance, practical restoration activities were essential to stabilize degraded areas and rebuild ecosystem functionality. Enrichment planting in degraded forest patches introduced native species aligned with the potential natural vegetation. These included high

value timber species and multipurpose trees that provide fruits, fodder, or soil enrichment. ANR was promoted in areas where seed sources and rootstocks were still present, reducing costs and building on natural ecological processes. Agroforestry systems were expanded around cocoa plantations, reintroducing shade trees that improve soil fertility, reduce disease pressure, and enhance biodiversity. On degraded hillsides, SWC structures combined with vegetative cover reduced erosion and stabilized slopes.

Governance and Institutional Frameworks

Restoration in Cameroon required bridging national policies with local realities. The government has committed to international restoration targets through AFR100 and the Bonn Challenge, but translating these into local action was a challenge. AREECA facilitated participatory land-use planning processes where communities, local authorities,

and forestry officials co-developed restoration priorities. These plans balanced livelihood needs with ecological goals, ensuring buy-in and legitimacy. The involvement of traditional chiefs provided cultural legitimacy, while engagement with decentralized administrative structures linked local action to national strategies.

Socio-Economic Dimensions

Given high levels of rural poverty, restoration interventions had to generate tangible benefits for households. Community nurseries provided employment and a source of income through the sale of seedlings. Cocoa agroforestry improved crop resilience and opened opportunities for certification schemes that provide higher market returns. Sacred forest management created opportunities for eco-cultural tourism and strengthened community cohesion. The integration of livelihood benefits ensured that restoration was not perceived as an external imposition but as a pathway to improve well-being.

Lessons from Cameroon's Approach

The Cameroonian case demonstrates that FLR is most effective when it recognizes cultural governance systems while embedding them in formal structures. Sacred forests show how cultural taboos can serve as a foundation for biodiversity protection, but their sustainability depends on legal reinforcement and integration into land-use planning. Technical interventions (enrichment planting, agroforestry, and soil stabilization) were effective because they were aligned with both ecological realities and community needs. The combination of cultural legitimacy, legal frameworks, and livelihood incentives created a multi-layered approach that is more resilient than purely technical measures.

Cameroon illustrates the potential of hybrid governance systems that draw on tradition, law, and community engagement. This contextualization of FLR demonstrates that successful restoration is not about importing models from outside, but about building on what exists, strengthening it with modern science, and adapting it to current pressures.

6.2 Kenya

FLR in Kenya under AREECA took place in highly diverse ecological zones that stretch from humid highlands to dryland savannas. The principal drivers of degradation are linked to population growth, demand for agricultural land, and reliance on biomass energy. In the highland catchments, expansion of smallholder farms and overgrazing have reduced tree cover, intensified soil erosion, and led to declining water quality for downstream urban centres such as Nairobi. In the arid and semi-arid rangelands, repeated droughts combined with overstocking of livestock have degraded grasslands and reduced the availability of fodder. Charcoal production and unsustainable harvesting of fuelwood add to this pressure, while infrastructure development fragments habitats and reduces connectivity between ecological zones.

Contextual Drivers of Degradation

Kenya's Upper Tana and Athi river catchments supply water for millions of people and for hydropower generation. Yet erosion from steep agricultural slopes delivers heavy sediment loads into rivers, raising water treatment costs and reducing the life span of reservoirs. At the same time, the dryland counties that make up more than two thirds of the country face advancing desertification due to a combination of unsustainable grazing practices, climate variability, and limited investment in rangeland management. These contrasting challenges required differentiated but complementary restoration strategies that address both water security and dryland resilience.

Integration of Community Institutions

Restoration efforts in Kenya have been shaped by the long-standing role of community forest associations and water resource user associations. These local organisations provide a framework for collective decision making and management. AREECA built on this institutional foundation to strengthen participatory planning and to promote shared responsibilities between communities, county governments, and national agencies. The approach recognised that without local legitimacy, restoration measures would be difficult to maintain once external support is withdrawn.

Technical Restoration Measures

In the highland zones, interventions focused on SWC combined with agroforestry. Contour bunds and terraces were constructed on steep slopes to reduce runoff and sediment transport. Farmers were trained in the establishment of vegetative strips using species such as Napier grass and vetiver which provide fodder while anchoring soil. Agroforestry practices were promoted to diversify farm output and stabilise soils. Trees such as Grevillea robusta, fruit trees, and indigenous multipurpose species were planted in farms and homesteads. These trees provided shade, timber, fruit, and fodder while increasing overall tree cover. Along rivers and streams, riparian buffers were restored with indigenous species to filter runoff and stabilise banks.

In the arid and semi-arid counties, restoration targeted rangeland health. Grass reseeding with native species such as Cenchrus ciliaris and Chloris gayana was carried out in degraded pastures. These grasses are drought tolerant and provide reliable fodder. Community enclosures were established where grazing was temporarily excluded to allow vegetation recovery. Soil bunds and water harvesting structures captured scarce rainfall and enhanced moisture availability for reseeded grasses. Tree planting in drylands combined indigenous species that support ecological resilience with selected fast-growing exotics that provide early sources of fuelwood and poles. This careful selection ensured that interventions met immediate livelihood needs while restoring long term ecological function.

Governance and Policy Linkages

Kenya is among the few African countries that has translated global restoration commitments into national policy frameworks. The government has pledged to restore 5.1 million hectares under the Bonn Challenge and AFR100. Within AREECA, restoration activities were aligned with the national strategy and further supported by devolved county

structures. County governments integrated restoration into county integrated development plans which provided a legal and budgetary anchor. Multi stakeholder platforms such as the Water Towers Agency and the Kenya Forest Service facilitated coordination across sectors. These arrangements ensured that restoration was not treated as an isolated project but as part of long-term development planning.

Socio Economic Dimensions

Livelihood benefits were central to adoption. In highland areas, tree planting provided fruit and timber for household consumption and sales, while soil conservation improved yields of maize and beans. In drylands, rangeland restoration increased fodder availability and reduced conflicts over grazing. Community based seed banks and nurseries created new income streams. In some catchments, innovative financing mechanisms such as water funds linked upstream farmers with downstream water users. Farmers who adopted SWC practices received incentives funded by utilities that benefit from improved water quality.

Lessons from Kenya's Approach

Kenya demonstrates how a combination of policy alignment, strong community institutions, and technically diverse interventions can create a robust restoration model. The differentiation between humid catchments and arid rangelands shows the importance of tailoring interventions to ecological zones. SWC measures reduced erosion in critical catchments, while rangeland enclosures and reseeding restored productivity in drylands. Linking local action with national strategies and international commitments created a multi-level framework that reinforced accountability.

The Kenyan experience also highlights the importance of integrating livelihood benefits and innovative financing mechanisms. Water funds and PES services models created incentives that extend beyond donor cycles. By embedding restoration in county planning, the interventions achieved institutional sustainability. Kenya's contextualisation of FLR therefore provides lessons for scaling across Africa, particularly in countries that face both highland erosion and dryland degradation within a single national territory.

6.3 Malawi

Malawi is among the most densely populated countries in Africa with an average of 103 inhabitants per square kilometre (https://tenuresecurity.org/country-profile/malawi). This demographic pressure translates directly into land degradation. More than eighty percent of households rely on subsistence agriculture and fuelwood for daily energy. As a result, deforestation rates are among the highest in the region, soils are depleted, and water catchments are under severe stress. AREECA's interventions in Malawi had to navigate these realities by combining ecological restoration with strategies that address livelihood insecurity and governance challenges.

Contextual Drivers of Degradation

The main drivers of degradation in Malawi include expansion of smallholder farms into marginal areas, unsustainable harvesting of fuelwood, overgrazing, and recurrent bushfires. Hillsides are cultivated without adequate soil conservation measures, leading to gully formation and sedimentation of rivers and reservoirs. Tobacco cultivation, which is labour intensive and often reliant on wood for curing, accelerates forest loss. Population density leaves little land for fallows, reducing natural regeneration capacity. Climate variability, with more frequent droughts and intense rains, further destabilises farming systems and contributes to declining yields.

Institutional Anchors and Traditional Leadership

A defining feature of the Malawian approach is the active role of traditional leaders. Chiefs exercise strong authority over communal land and local resource use. AREECA built on this institutional reality by supporting a Chiefs Forum that brought together traditional authorities from different districts. This forum served as a platform for exchanging knowledge on sustainable land management, harmonising customary rules, and mobilising collective action. Chiefs enforced rules on controlled grazing, tree cutting, and fire management, creating social legitimacy for restoration measures. The involvement of traditional leadership also increased compliance and provided continuity beyond the project cycle.

Technical Restoration Measures

On cultivated hillsides, SWC structures such as contour bunds, terraces, and infiltration pits were established to reduce runoff and improve soil moisture. These structures were reinforced with vetiver and other deep-rooted grasses that provide fodder while stabilising soil. In community woodlots, fast growing species like eucalyptus and pine were planted to supply fuelwood and construction poles, thereby reducing pressure on natural forests. At the same time, enrichment planting with indigenous species such as miombo trees reintroduced ecological functions and improved biodiversity.

River catchments received targeted interventions to safeguard water supply. Buffer zones were reforested with native species, while check dams and small reservoirs were built to regulate water flow and reduce downstream sedimentation. In grazing areas, controlled access combined with reseeding of native grasses allowed pastures to recover. Fire management committees were established to reduce the frequency of uncontrolled burns that damage young trees and grasses.

Livelihood Integration

Malawi's restoration efforts were deliberately tied to household economic benefits. Community nurseries not only produced planting material but also generated employment, especially for women and youth. Agroforestry systems were promoted, integrating species such as Faidherbia albida that improve soil fertility and crop yields. Farmers gained fuelwood, fodder, and fruit, reducing their dependence on degrading natural forests. Beekeeping was introduced around restored areas as an additional income source that depends on forest cover and creates incentives for protection.

Governance and Policy Linkages

The government of Malawi has made commitments under AFR100 and the Bonn Challenge, aiming to restore 4.5 million hectares. AREECA activities were aligned with these targets and linked to district development planning. By engaging traditional authorities alongside district councils, the project bridged the gap between customary and formal governance. Chiefs Forums complemented government structures by anchoring restoration in social institutions, while district officers provided technical oversight and integration with national policy frameworks.

Lessons from Malawi's Approach

Malawi's experience shows that restoration cannot succeed without addressing the overwhelming reliance on natural resources for daily survival. Providing alternative sources of biomass through woodlots, diversifying income through agroforestry and beekeeping, and improving soil fertility directly addressed the needs of communities. The Chiefs Forum demonstrated how traditional institutions can serve as powerful drivers of compliance and collective action, especially in rural societies where state presence is limited.

From a technical perspective, combining fast growing exotics for immediate needs with indigenous species for long-term ecological recovery proved effective. SWC structures improved crop yields. (Farmers in Malawi reported that the yield increased from 1,750 kg/ha to 3,400 kg/ha). Additionally, reduced downstream sedimentation illustrates how ecological interventions and livelihood benefits can align. By institutionalizing restoration in both traditional and formal governance frameworks, Malawi created a model that is locally legitimate, ecologically effective, and politically sustainable.

6.4 Rwanda

Rwanda presents a distinct context for FLR within AREECA. It is one of the most densely populated countries on the continent, with more than 500 people per square kilometre in some districts. Agricultural land scarcity and reliance on biomass for energy have driven extensive deforestation and soil degradation. The country is also highly vulnerable to intense rainfall events that trigger erosion and landslides on steep hillsides. At the same time, Rwanda has shown exceptional political will and institutional organisation for restoration, having pledged to restore two million hectares by 2030 and embedding this commitment into national strategies.

Contextual Drivers of Degradation

The major drivers of degradation in Rwanda include overexploitation of wood for cooking and construction, expansion of agriculture onto marginal slopes, and unsustainable grazing. Hillside farming without adequate conservation measures accelerates erosion, while river catchments face siltation from upland runoff. Urbanisation creates additional demand for charcoal, which is supplied by rural districts. Climate change exacerbates these pressures, with extreme rainfall intensifying landslides and droughts reducing crop yields.

Institutional Anchors and National Commitment

Unlike in many countries, restoration in Rwanda is strongly guided by national policy and implemented through decentralised government structures. The government has integrated restoration targets into the Green Growth and Climate Resilience Strategy, the National Forestry Policy, and district development plans. This top-down commitment creates a strong enabling environment. At the same time, local government structures and community-based organisations play a critical role in translating national commitments into action on the ground. AREECA worked within this framework, complementing government programmes with technical support, monitoring, and community mobilisation.

Technical Restoration Measures

Restoration interventions were closely tied to the biophysical realities of Rwanda's steep terrain. Hillside terraces were constructed to reduce runoff, prevent landslides, and create level plots for agriculture. These terraces were often combined with agroforestry systems that integrated trees such as Grevillea robusta, fruit trees, and nitrogen fixing species. Contour bunds and grass strips reinforced soil stability while providing fodder.

Woodlot establishment was a major focus, given the dependence on biomass energy. Fast growing species such as eucalyptus were planted in designated areas to provide fuelwood and construction material, thereby reducing pressure on natural forests. At the same time, enrichment planting with indigenous species was promoted in protected areas and buffer zones to restore ecological functionality. Wetland rehabilitation was another priority, with communities mobilised to remove invasive species, restore native vegetation, and regulate drainage. These measures improved water regulation and biodiversity habitat.

Socio Economic Integration

Rwanda's restoration approach emphasised co-benefits for households. Agroforestry improved soil fertility and diversified farm production, providing fruit, fodder, and timber. Terracing enhanced crop yields and reduced risk of landslides, directly benefiting food security. Community nurseries provided jobs and ensured local availability of planting material. Woodlot establishment gave communities a sustainable source of energy and income. Restoration projects also promoted gender inclusion by engaging women's groups in nursery management, terrace maintenance, and agroforestry enterprises.

Governance and Monitoring

Rwanda stands out for its emphasis on monitoring and accountability. Restoration achievements are systematically tracked through government reporting systems and linked to performance contracts at

district and sector levels. AREECA contributed to this system by introducing standardised monitoring tools and training local actors in data collection. This culture of accountability ensured that restoration was not only planned but also measured and evaluated.

Lessons from Rwanda's Approach

The Rwandan case demonstrates the power of strong national leadership combined with community mobilisation. The scale and speed of implementation were made possible by aligning restoration with government priorities and embedding them in district planning. Technical measures such as terracing and agroforestry directly addressed the biophysical drivers of degradation, while woodlot establishment reduced pressure on natural forests by meeting energy demand.

The Rwandan experience also shows the importance of balancing short term livelihood needs with long term ecological goals. Planting fast growing exotics addressed immediate energy demand, while enrichment with indigenous species restored biodiversity and ecosystem services. Monitoring systems anchored in government performance contracts provided accountability and transparency. The combination of political will, technical measures, and socio-economic integration created a model that other countries can learn from, even though replication requires adaptation to local governance and social contexts.

7
Synthesis of best practices

7.1
Effective technical methodologies from the AREECA countries

7.1.1 Plantations/Roadside plantations

Plantations are among the most widely used and visible restoration techniques, particularly in contexts where rapid greening, soil stabilization, or livelihood benefits are urgently required. They serve multiple purposes: from reducing erosion and providing biomass to establishing corridors for biodiversity and restoring degraded soils. Within AREECA, plantations were not implemented as isolated interventions but as part of integrated landscape strategies, thereby linking technical measures with socio-economic incentives and governance frameworks.

A key consideration in plantation design is the selection of tree species. The choice between indigenous and exotic species is not merely technical but reflects broader objectives of restoration. Fast-growing exotic species (such as eucalyptus spec. or grevillea robusta) can be appropriate where there is an urgent demand for fuelwood, timber, or construction material. By meeting these needs quickly, such plantations help relieve pressure on natural forests, thereby addressing one of the main drivers of degradation. This makes them particularly useful along roadsides or in designated community woodlots where harvesting is part of the management plan. However, reliance on exotic species alone carries ecological risks, including soil nutrient depletion, high water consumption, or low biodiversity value.

Where the primary goal is to restore ecological functionality, plantations should rely predominantly on indigenous species, ideally selected to reflect the local PNV. Indigenous trees are generally better adapted to local climatic and soil conditions, contribute more significantly to biodiversity, and strengthen ecosystem services such as water regulation, soil stability, and habitat provision. They also have a higher cultural and social value in many communities, making them essential for long-term acceptance and sustainability. In these cases, exotic species should be avoided, and mixed-species plantations aligned with local PNV offer the best outcomes.

The AREECA experience shows that plantations are most successful when they balance ecological and socio-economic objectives. In Rwanda, roadside plantations combined indigenous trees with selected exotics to stabilize slopes and simultaneously provide fodder and firewood to communities. This reduced soil erosion and improved road safety while generating direct benefits for local households. In Malawi, plantations were strategically located along forest reserve access roads, discouraging illegal encroachment while creating opportunities for sustainable timber harvesting under co-management agreements. Cameroon emphasized the use of culturally significant indigenous species in plantations around sacred forests, reinforcing local ownership and ecological legitimacy.

An additional lesson is that plantations require long-term maintenance and clear governance arrangements. Survival rates depend not only on technical design but also on community involvement in protection, weeding, and replacement planting. Roadside plantations in particular benefit from being embedded in local bylaws or agreements with district authorities, ensuring their upkeep. Integrat-

ing plantations into broader livelihood strategies, such as linking them with value chains for non-timber products or community funds, further enhances sustainability.

In summary, plantations under AREECA highlight that this restoration method remains a valuable approach, provided it is applied with clarity of purpose. If the goal is rapid provision of biomass or immediate livelihood support, exotic species can play a role in easing pressure on natural forests. If the aim is to restore ecological functionality and biodiversity, indigenous species aligned with the local PnV are essential. The decisive factor is therefore a goal-oriented species selection that responds directly to the drivers of degradation and the intended long-term function of the restored site.

7.1.2 Anti-erosive measures/soil and water conservation

Soil erosion is among the most severe forms of land degradation across sub-Saharan Africa, particularly in hilly and semi-arid landscapes. Anti-erosive measures represent a technical backbone of FLR, aimed at stabilizing soils, retaining water, and enhancing agricultural productivity. Standard techniques include terracing, contour bunds, check dams, and vegetative barriers, often applied in combination to maximize impact.

Roadside plantation in Kenya

SWC activities on farmland in Kenya

AREECA countries demonstrated the value of tailoring these measures to specific ecological and social contexts. In Rwanda, the construction of radical and progressive terraces combined with agroforestry tree planting significantly reduced soil loss on steep slopes, while simultaneously boosting crop yields. In Cameroon, vegetative strips using vetiver grass were introduced to protect fragile soils against heavy rainfall events. In Kenya, stone bunds and small check dams were deployed in semi-arid areas, helping to slow runoff and recharge groundwater. These interventions highlight that anti-erosive measures are most effective when integrated into farming systems, aligning conservation objectives with the immediate interests of local communities.

7.1.3 Area closures

Area closures, or the temporary restriction of human activities in degraded landscapes, have emerged as a highly effective method of allowing natural regeneration. The concept is based on the recognition that many ecosystems retain a strong capacity for self-recovery if given sufficient protection from overgrazing, fuelwood collection, and cultivation. Effective closures require clear governance mechanisms, law enforcement, strong local buy-in, and, ideally, incentive structures to compensate for short-term livelihood trade-offs.

Within AREECA, area closures were applied in both dryland and forest ecosystems, with impacts on vegetation recovery and biodiversity. In Kenya's rangelands, rotational grazing systems created seasonal closures that allowed pastures to regenerate, reducing conflicts between herders and conservation authorities. In Malawi, communities established closure zones within multi-use forest blocks, agreeing collectively to limit access in exchange for long-term benefits such as beekeeping and sustainable timber use. Rwanda applied partial closures in erosion-prone zones, linking them with community conservation agreements and financing through the CECF. These experiences underscore that area closures are most sustainable when embedded in community-led governance frameworks and coupled with alternative livelihood options to offset short-term restrictions.

Natural regeneration impacts after area closure in one of the Mvai forest blocks.

Seedling protected from grazing and browsing in an area closure (Malawi)

7.1.4 Rangeland restoration

Rangeland degradation is a critical challenge across sub-Saharan Africa, often driven by overgrazing, land conversion, and climate variability. Degraded rangelands lose their capacity to provide ecosystem services such as fodder, water infiltration, and biodiversity habitat, while pastoral livelihoods become increasingly vulnerable. Restoration of rangelands requires both ecological interventions and institutional arrangements that regulate access and grazing intensity. Key technical measures include grass reseeding, rotational grazing systems, fodder production, and soil stabilization through check dams and vegetative barriers.

Within AREECA, rangeland restoration was particularly prominent in Kenya, where pastoral communities were engaged in designing rotational grazing plans supported by Water Resource User Associations and community bylaws. Grass reseeding with native drought-tolerant species improved fodder availability and reduced soil erosion, while estab-

Soil band structure before branches are added established to support grass restoration in Kenya.

lishing pasture reserves allowed ecosystems to regenerate. In Malawi, rangeland restoration was integrated into multi-use forest blocks, where controlled grazing combined with fire management measures helped reduce further degradation. These experiences highlight that rangeland restoration succeeds when it balances pastoral livelihoods with ecological regeneration, ensuring that communities benefit directly from improved rangeland productivity.

7.1.5 Agroforestry

Agroforestry represents one of the most versatile and impactful approaches in Forest Landscape Restoration, as it integrates trees with crops and/or livestock to enhance productivity, diversify livelihoods, and restore ecological functions. The method addresses key drivers of degradation by reducing pressure on forests for timber and fuelwood, improving soil fertility, and increasing resilience to climate change. A major advantage of agroforestry is its adaptability: systems can range from simple boundary planting to complex multi-strata arrangements, tailored to ecological and socio-economic conditions.

AREECA countries showcased diverse agroforestry practices. In Rwanda, tree planting on terraces and farmlands reduced soil erosion while providing households with fruit, fodder, and wood products. In Cameroon, agroforestry systems combined food crops with indigenous tree species to restore fertility in shifting cultivation landscapes. Malawi applied agroforestry to address soil nutrient depletion, using nitrogen-fixing trees intercropped with maize to boost yields and food security. In Kenya, agroforestry was linked with value chains, particularly for fruit trees and fodder shrubs, demonstrating how the approach can generate income while restoring degraded farmland. Across contexts, the success of agroforestry depended on farmer training, access to seedlings, and secure land tenure, ensuring that benefits motivated long-term adoption.

7.1.6 Other FLR interventions

Beyond plantations, erosion control, rangelands, and agroforestry, AREECA also piloted and refined a range of complementary FLR interventions that addressed local degradation drivers and strengthened landscape resilience. These included ANR, in which degraded areas were protected from hu-

Improved irrigation schemes to support smallholder agriculture in Malawi

man disturbance to allow spontaneous regrowth. In several sites, ANR proved more cost-effective and ecologically robust than tree planting, especially in areas with strong natural regeneration capacity.

Another significant intervention was the promotion of energy-efficient cookstoves, particularly in Rwanda and Malawi, reducing fuelwood demand and indoor air pollution. In Cameroon, the mapping and formal recognition of sacred forests linked cultural governance with restoration, creating locally legitimate conservation zones. Beekeeping and non-timber forest product enterprises were promoted across countries as livelihood alternatives that reduce pressure on forests while generating income. Water-related interventions, such as spring protection and wetland restoration in Kenya, demonstrated the cross-sectoral benefits of FLR for water security and agriculture.

Taking together, these complementary measures highlight AREECA's holistic approach, in which technical interventions are embedded in broader livelihood, governance, and policy frameworks. By diversifying restoration practices, the programme ensured that interventions were tailored to the specific ecological conditions and socio-economic needs of each landscape.

7.2 Administrative and organizational best practices

The Power of Concerted Efforts

The AREECA consortium demonstrates the vital role of collaboration and partnerships in accelerating restoration in Africa. This approach enhances coordination, knowledge and capabilities exchange/sharing, resource utilization, ultimately leading to maximum impact.

Prioritizing Community-Centred Restoration

To accelerate restoration efforts and achieve measurable impacts, governments need to move away from a top-down restoration where restoration plans are prescribed to communities, landowners, and farmers. Instead, community-based restoration must be adopted to ensure solutions are tailored to local needs, funding is taken to the communities for action, and restoration becomes part of the people's daily lives. This will consequently translate to empowering communities to take ownership of the process. And so, governments must encourage grassroots restoration movements by providing communities with the necessary resources and skills.

Other vital aspects of community-centric restoration include strengthening local extension services, integrating restoration governance into local and traditional plans, establishing community-based financing mechanisms supported by farmer-centric value chains, actively involving youth and women, and fostering local coordination and knowledge exchange among farmers. A prime example of this is AREECA's development of the Community Environment Conservation Scheme, which offers farmer groups revolving funds at a low 2% interest rate, provided they implement FLR actions.

Optimizing Restoration at the Subnational Level

A core activity of AREECA is conducting subnational restoration assessments using the ROAM in the four AREECA countries. This allows partners to identify and champion potential restoration solutions. The assessment helps target and optimize restoration activities, yielding various benefits across landscapes. Furthermore, it enables the consortium to better geolocate and optimize available resources while collaborating with existing initiatives. ROAM is a proven best practice for project baselining and indicator setting at national, subnational, landscape, and site levels.

Improving Cross-Sectoral Coordination

African governments have often struggled to accelerate restoration due to duplicated efforts among actors and stakeholders. Regular restoration stocktaking through a cross-sectoral platform is essential for ensuring systematic restoration coverage nationwide. Cross-sectoral coordination, known in AREECA as the "cross-sectoral taskforce for FLR" in Rwanda and Malawi, is an excellent way to share knowledge and expertise and generate innovative restoration ideas. The 2022 Restoration Barometer

application has also helped several countries, including those in AREECA, form National Working Groups. These groups support comprehensive restoration stocktakes, enabling governments to assess the distribution of restoration efforts for better planning.

Integrating FLR into Local Development Plans

Recognizing Africa's rapid socioeconomic development, the AREECA collaboration has focused on informing development from a sustainable perspective. In Rwanda, AREECA has supported the creation of sustainable forest development plans in two districts. Similarly, in Malawi, the programme is assisting in developing four local development plans, ensuring that FLR and Nature-based Solutions (NbS) concepts are integrated into the development frameworks.

Encouraging Private Sector Investment Through PES and Structured PPPs

To democratize restoration financing in Africa and bridge the funding gap, AREECA, through the IUCN, assisted Rwanda in designing an actionable PES scheme. This program, which will be managed by a public-private partnership, aims to attract investments from various water consumers in the eastern province, starting with the country's Water Consumer Associations. The evidence-based scheme model is informed by action-inaction InVEST scenario modelling.

7.2.1 Partnership models and multi-stakeholder collaboration

Successful FLR requires coordinated action across multiple levels and actors, given the diversity of land-use pressures and the interdependence of ecological and social systems. Partnership models that bring together governments, NGOs, local communities, and international partners have proven particularly effective in overcoming fragmented approaches and ensuring collective ownership. Multi-stakeholder platforms allow for inclusive planning, reduce duplication, and provide space for conflict resolution.

Within AREECA, collaboration was institutionalized through national steering committees, local governance platforms, and regional exchanges. For example, in Malawi, the establishment of multi-use forest blocks under co-management brought together community groups, forestry officials, and local authorities in shared decision-making. In Rwanda, CECS combined household-level commitments with structured group savings mechanisms, linking social cohesion to environmental compliance. At regional level, cross-country knowledge exchanges and hospitations created opportunities for peer-to-peer learning between practitioners in Kenya, Ethiopia, and Cameroon. These partnership models highlight that sustainable FLR is not the result of isolated projects, but of structured networks of collaboration that align diverse actors around common restoration goals.

7.2.2 Cooperation between NGOs, governments and private sector

The complexity of restoration challenges requires not only collaboration among NGOs and governments, but also the systematic involvement of the private sector. Governments provide enabling policy frameworks and regulatory oversight, NGOs contribute technical expertise and community facilitation, while the private sector brings financial resources, innovation, and market access. Effective cooperation therefore depends on mechanisms that align these contributions and distribute responsibilities clearly.

AREECA facilitated this cooperation in several ways. In Kenya, private companies supported restoration in the Upper Tana Basin as part of water funds, linking upstream restoration with downstream water quality improvements for urban utilities. In Rwanda, over a dozen companies committed annual funds to restoration, building trust in the frameworks established under national restoration strategies. Cameroon's recognition of sacred forests as legal conservation zones benefited from NGO facilitation but required government endorsement to become enforceable. In Malawi, community forest blocks created opportunities for small-scale enterprises to

invest in non-timber forest products, supported by enabling regulations. These examples illustrate that cooperation thrives when each actor's comparative advantage is recognized and formalized within institutional agreements and financial frameworks, turning restoration into a shared responsibility across sectors.

7.2.3 Strategies for gender and social inclusion

Restoration initiatives risk reproducing social inequalities if they fail to address issues of gender and inclusion. Women, youth, and marginalized groups are often both the most affected by land degradation and the least represented in decision-making. Effective strategies for social inclusion therefore ensure that FLR does not only restore ecosystems but also enhances equity and social justice. Key approaches include participatory planning, capacity development for underrepresented groups, and targeted benefit-sharing mechanisms.

AREECA integrated these principles throughout its interventions. In Rwanda, the CECF explicitly included women and youth as primary beneficiaries, providing micro-loans tied to conservation agreements. In Malawi, co-management agreements required the participation of women in forest block governance structures, ensuring their voices in rule-making and benefit distribution. In Kenya, youth-led restoration enterprises created employment opportunities for young people, positioning them as central actors in the FLR economy. Cameroon's recognition of sacred forests also incorporated cultural custodianship roles of women, strengthening their legitimacy in community governance. These strategies highlight that gender and social inclusion are not side activities but core enablers of sustainability, ensuring that restored landscapes are embedded in socially cohesive and equitable structures.

8
Additional considerations

8.1
Stakeholder harmonization

FLR is inherently complex, involving actors from different sectors such as forestry, agriculture, water, and rural development. Without harmonization, restoration efforts risk duplication, conflicting agendas, and inefficiency. Stakeholder harmonization therefore refers to structured processes that align priorities, clarify roles, and establish platforms for dialogue. Effective harmonization increases ownership, avoids institutional overlaps, and fosters long-term accountability.

Within AREECA, stakeholder harmonization was pursued through multi-level coordination mechanisms. In Rwanda, the project aligned its interventions with the national FLR strategy, ensuring complementarity with government priorities and donor programmes. In Malawi, the Chiefs Forum was created as an institutional bridge between traditional authorities and district officials, harmonizing customary and statutory governance systems. In Kenya, catchment-level platforms linked community associations with government agencies, ensuring water, agricultural, and forest objectives were considered jointly. These experiences show that harmonization is not a one-off activity but a continuous process of negotiation and adjustment, requiring strong facilitation and trust-building among actors.

8.2
Creation of synergies

Beyond harmonization, the creation of synergies is essential for maximizing the impact of restoration investments. Synergies arise when interventions reinforce each other across sectors, scales, or thematic areas. They help to leverage resources, avoid redundancy, and create added value beyond the sum of individual projects. For FLR, synergies are especially important given the cross-sectoral nature of land-use challenges.

AREECA actively fostered synergies by linking technical, institutional, and financial measures. For example, agroforestry interventions in Rwanda were not implemented in isolation but tied to microfinance mechanisms through the CECF. In Kenya, rangeland restoration was connected to water sector financing, demonstrating the co-benefits of improved land management for downstream water utilities. In Malawi, the establishment of multi-use forest blocks created synergies between conservation, livelihoods, and governance by combining co-management with alternative income sources such as beekeeping. Cameroon showcased how cultural and ecological synergies can be created by embedding sacred forest traditions into statutory land-use planning. These cases demonstrate that synergies strengthen restoration outcomes by linking ecological functions with socio-economic incentives, turning fragmented actions into integrated landscape approaches.

8.3
Complementary approaches

Complementarity is another essential principle in scaling FLR. It ensures that restoration interventions fill gaps rather than replicate efforts, and that they cover diverse ecological zones and thematic areas. Geographical complementarity avoids concentrating resources in a few locations while leaving other degraded areas unattended. Content-wise complementarity ensures that technical measures (e.g., soil conservation, plantations, agroforestry) are matched with governance, financing, and social inclusion strategies.

AREECA deliberately adopted a complementary approach by operating in four countries with diverse ecological and socio-economic conditions. This provided a comparative basis for learning: Cameroon focused on integrating cultural governance, Rwanda emphasized erosion control and financial incentives, Malawi demonstrated co-management of forest reserves, and Kenya piloted water-linked restoration and rangeland management. Content-wise, interventions combined technical measures such as terracing and grass reseeding with institutional innovations like multi-stakeholder platforms and conservation funds. This allowed AREECA to generate a portfolio of approaches that were mutually reinforcing rather than overlapping. The result was a programme that not only delivered site-level impact but also provided transferable lessons for regional and global FLR initiatives.

8.4 Establishment of national FLR strategies

The establishment of coherent national FLR strategies is a critical precondition for scaling restoration beyond project-based interventions. Such strategies provide a framework for setting targets, aligning policies, and coordinating the efforts of government institutions, civil society, and the private sector. They also facilitate access to international financing by linking national priorities with global commitments such as the AFR100 and the Bonn Challenge.

AREECA contributed to this agenda by supporting partner countries in refining their national FLR frameworks and aligning restoration activities with existing policy instruments. In Rwanda, interventions were embedded within the National FLR Strategy, ensuring strong government ownership and policy coherence. In Kenya, AREECA worked in line with national restoration targets, thereby strengthening institutionalization of FLR processes. Malawi and Cameroon also benefited from technical contributions that supported the integration of FLR into broader land-use and forest policies.

At the regional level, the participation of AUDA-NEPAD as part of the AREECA consortium played a catalytic role in supporting harmonization, policy dialogue, and continental strategy development. AUDA-NEPAD's mandate offered a unique opportunity to connect country-level implementation with regional processes and to strengthen the political momentum behind FLR in Africa.

The experience underscores that national strategies remain essential for sustainability, but their successful establishment requires not only technical support but also effective regional facilitation. Future programmes may therefore build on the AREECA experience by ensuring that regional partners are more systematically empowered to perform their intended catalytic functions.

8.5 The assumption of radiative effects (1:5 ratio)

A central assumption in the design and reporting of the AREECA programme is that for every hectare of land actively restored, approximately five additional hectares benefit indirectly from ecological and socio-economic spillovers. This 1:5 ratio has been widely used in FLR programmes to estimate landscape-level impact beyond the direct intervention area. While it provides a convenient framework for projecting outcomes, a critical examination reveals several limitations and uncertainties that should be acknowledged.

Empirical evidence supporting the precise magnitude of such spillovers remains limited. Beneficial effects on surrounding landscapes, such as improved soil fertility, water regulation, biodiversity enhancement, and livelihood opportunities, are highly context-dependent and influenced by factors including landscape configuration, ecosystem connectivity, land tenure systems, and local governance structures. Consequently, the assumption that one hectare restored automatically produces measurable benefits on five hectares may overestimate the spatial and temporal reach of restoration interventions.

Furthermore, socio-economic benefits are not uniformly distributed. Spillovers depend on the engagement of neighbouring communities, access to restored resources, and local capacity to adopt sustainable practices. In areas with fragmented land tenure, weak institutional support, or high population pressure, the realized benefits may fall well below the 1:5 projection. Similarly, ecological benefits such as seed dispersal, hydrological regulation, or habitat connectivity are subject to threshold effects and nonlinear dynamics, which can constrain the effective area positively influenced.

To address these uncertainties, we recommend integrating monitoring and verification mechanisms that track both directly restored and benefiting lands. Adaptive management approaches should be used to refine assumptions over time rather than relying on fixed multipliers. When projecting outcomes for policy or reporting purposes, it is advisable to present a range of plausible scenarios supported by empirical observations or modelling to better capture the variability in restoration impacts. By explicitly acknowledging the limitations of the 1:5 assumption, future programmes can improve both the scientific rigor and credibility of landscape-level impact assessments.

9
Challenges

9.1
Governance challenges

9.1.1 Stakeholder management

Cameroon

In Cameroon, stakeholder management was complicated by the coexistence of customary authorities, local government, and national forestry agencies. Chiefs and traditional councils held legitimacy in matters of land and forest use, while decentralized municipal councils carried administrative mandates, and the national Ministry of Forests and Wildlife retained statutory authority. These overlapping spheres of influence created occasional tensions, particularly where sacred forest protection intersected with agricultural expansion or timber interests.

Communication gaps between these governance levels slowed decision-making and sometimes weakened enforcement of restoration rules. To address these challenges, AREECA supported structured dialogue between traditional leaders, municipal councils, and forestry officials. Joint planning workshops and formalized local conventions helped delineate roles and responsibilities, ensuring that community rules gained recognition at higher levels of governance.

Kenya

Diverging priorities, varying levels of influence, and heterogeneous operational approaches among stakeholders led, at times, to delays in project implementation. Particularly problematic were gaps in institutional communication and the lack of clearly delineated responsibilities. In several instances, these structural ambiguities resulted in overlapping mandates, inefficient decision-making processes, or partial disengagement of key actors from project activities.

To mitigate these governance-related risks and enhance coordination efficiency, several instruments were introduced. These included the establishment of cross-functional coordination committees to ensure structured, interdisciplinary alignment among stakeholders, as well as a systematic stakeholder mapping process aimed at identifying, prioritizing, and strategically engaging relevant actors. Additionally, bilateral and multilateral cooperation frameworks like MOU were developed to formally define roles, communication protocols, and mutual expectations. These interventions were designed to reduce governance complexity, strengthen institutional coherence, and improve the overall effectiveness of project steering mechanisms.

Malawi

In Malawi, the presence of the Chiefs Forum was a strength but also introduced governance complexities. Chiefs wield strong authority over land allocation, and their decisions occasionally conflicted with district government plans or with the objectives of forestry officers. This dual authority created inconsistencies in enforcement, for example when chiefs permitted clearing of land that district officers had earmarked for restoration. AREECA mitigated these risks by institutionalising collaboration between traditional leaders and district authorities through co-management agreements. These agreements clarified decision-making procedures and ensured that customary authority was harmonised with statutory frameworks.

Rwanda

Rwanda's strong state-led approach provided clarity of responsibility but at times left limited space for community initiative. Local authorities were

accountable for meeting national restoration targets, yet communities sometimes felt insufficiently involved in shaping interventions. This top-down structure created risks of disengagement or limited ownership. To counterbalance this, AREECA encouraged participatory planning at the district and sector levels, ensuring that communities had a voice in land-use decisions. Training programmes for community-based organizations strengthened their capacity to articulate local priorities within government-led frameworks.

9.1.2 Policy alignment

Cameroon

Policy alignment in Cameroon was challenged by the slow integration of community-based restoration practices into national forestry and land-use policies. Sacred forests, despite their ecological and cultural importance, lacked formal recognition in statutory law until local conventions were supported under AREECA. This gap created legal uncertainty, with community conservation efforts sometimes undermined by commercial logging concessions or agricultural policies promoting expansion. Advocacy at municipal and regional levels proved essential to bridge this divide, highlighting the need for stronger integration of customary systems into national restoration strategies.

Kenya:

One of the prominent governance challenges faced by the AREECA project in Kenya was the slow pace of government approvals for key policies, legal instruments, and strategies. These bureaucratic delays significantly impacted the timeline for implementation, particularly for frameworks essential to FLR. For instance, the long-awaited Benefit Sharing Bill failed to pass in parliament, and even the national restoration strategy underwent several revisions before adoption. Such setbacks demonstrate the need for stronger institutional coordination and advocacy to streamline legislative processes that support restoration work.

Malawi

In Malawi, policy alignment issues arose from inconsistencies between the forestry sector and agricultural policies. While forestry regulations supported reforestation and woodlot establishment, agricultural extension services continued to encourage practices that led to encroachment on marginal lands. This lack of harmonisation generated mixed signals for farmers and weakened incentives to adopt sustainable practices. AREECA sought to align policy implementation by facilitating joint planning between forestry and agricultural extension services, but the need for stronger national level integration remains.

Rwanda

In Rwanda, the policy framework for restoration was strong and clearly articulated, yet challenges emerged in translating ambitious national targets into practical and locally adapted measures. For example, the push for rapid woodlot establishment sometimes prioritised fast-growing exotic species without sufficient consideration of long-term ecological impacts. This illustrates the difficulty of balancing national energy security objectives with biodiversity and soil conservation goals.

9.1.3 coordination gaps

Cameroon

Coordination gaps between ministries responsible for forestry, agriculture, and land tenure occasionally delayed implementation. Competing interests between agricultural expansion policies and conservation objectives hindered restoration in frontier areas. AREECA promoted inter-ministerial dialogue, but the persistence of siloed mandates limited the effectiveness of coordination.

Kenya:

Communication between national and county governments was inconsistent, causing delays and misalignment of priorities.

Malawi

In Malawi, coordination challenges appeared most clearly at the district level. While district councils were tasked with integrating restoration into development plans, line ministries often provided vertical instructions that were not always aligned with local priorities. This fragmented communication sometimes resulted in duplication of effort or delayed approval of restoration activities.

Rwanda

In Rwanda, the hierarchical governance system reduced inter-agency conflict, but coordination gaps arose between central directives and local implementation capacity. Districts struggled to secure adequate resources to meet national restoration targets, creating a mismatch between expectations and delivery.

9.2 Challenges deriving from the project set up

9.2.1 Aligning country specific and general FLR approaches

Cameroon, Kenya Malawi, and Rwanda

Across the four countries, alignment between locally appropriate FLR practices and broader consortium-wide strategies required careful adaptation. Cameroon emphasized sacred forest protection and agroforestry, which differed from Malawi's focus on woodlots and soil conservation, and from Rwanda's large-scale SWC activities and woodlot establishment. While this diversity enriched the consortium, it also made harmonization of monitoring indicators and reporting frameworks more challenging. Continuous exchange among partners was needed to translate site-specific practices into general lessons without losing contextual nuance.

9.2.2 Information flow/ communication barriers

Cameroon

In Cameroon, communication barriers were linked to limited infrastructure and weak digital connectivity in rural areas. Project messages were often delayed or could not reach remote communities, especially during the rainy season when roads became impassable. This occasionally disrupted seedling distribution and monitoring schedules.

Kenya

The project encountered several difficulties in communication and information dissemination. During the rainy seasons, many beneficiaries were occupied with agricultural work, which delayed the reception and response to project communications. In some cases, messages were delivered on short notice, limiting the ability of stakeholders to react appropriately. Additionally, unclear communication led to misunderstandings and inefficiencies in coordination. Compounding these issues, poor road conditions during the rainy season made transportation and logistical coordination challenging, thereby hindering timely implementation and monitoring of activities.

Malawi

In Malawi, the reliance on local languages and the dominance of oral communication posed challenges for consistent information flow. Messages from district authorities did not always reach community members in a timely or clear manner. Seasonal agricultural workloads also limited availability for training sessions.

Rwanda

In Rwanda, communication systems were more robust, but rapid top-down information flow sometimes created misunderstandings at community level. Instructions were issued quickly, leaving limited time for dialogue or adjustment to local circumstances. This reduced flexibility in responding to local needs.

9.3 Other challenges

Cameroon
Climate variability affected Cameroon's forest margins, with shifting rainfall patterns undermining regeneration efforts and increasing fire risk in savanna transition zones. Market access for non-timber forest products remained weak, limiting incentives for restoration. Insecure recognition of sacred forests also created uncertainty for communities investing in long-term conservation.

Kenya
The AREECA project in Kenya faced several other operational and contextual challenges. Climate change posed a persistent threat, with extreme weather events such as drought and crop destruction undermining both restoration progress and local livelihoods. Market linkages were found to be weak, limiting the commercial viability of restoration-based enterprises and nature-based livelihoods

Malawi
Malawi faced recurring droughts and floods that undermined restoration gains. Limited access to markets for agroforestry products reduced economic incentives. Fire outbreaks in community woodlots destroyed young plantations, highlighting the need for more robust fire management systems.

Rwanda
In Rwanda, restoration was challenged by high population density, which left little land for ecological set-asides. Competing land-use demands often created tension between food production and restoration. In some cases, promotion of exotic species in woodlots threatened biodiversity, illustrating the difficulty of balancing energy needs with ecological goals.

9.3.1 Legal uncertainties

Cameroon
Legal ambiguity around land tenure in Cameroon hindered restoration, especially in areas where logging concessions overlapped with community claims. The absence of formal recognition for sacred forests created insecurity for communities managing these areas.

Kenya
Long policy and legal approval processes emerged as a considerable barrier to FLR implementation. As previously mentioned, important bills such as the Benefit Sharing Bill failed to gain traction in parliament, while strategic documents required multiple revisions before acceptance. These legal ambiguities created uncertainty for both community beneficiaries and implementing partners, hindering long-term planning and investment.

Malawi
In Malawi, uncertainty around the rights to benefit from community woodlots discouraged investment of labour and time. Lack of clear legal mechanisms for sharing revenues from restored areas created tension between communities and authorities.

Rwanda
In Rwanda, legal frameworks were clear, but rapid policy reforms created confusion at the community level, as rules and targets were frequently updated. Communities sometimes lacked sufficient guidance on how to align with new policies.

9.3.2 Incentives for private participation in FLR activities

Cameroon
Private sector engagement in Cameroon remained limited. Cocoa companies expressed interest in shade tree planting but lacked structured incentives to support large-scale agroforestry. The absence of clear benefit-sharing frameworks discouraged investment in restoration.

Kenya
Private sector engagement remained limited, largely due to the absence of sufficient incentives and linkages. The project identified a need to better connect beneficiaries with markets and to strengthen marketing groups. This includes providing digital marketing training and seed capital and enhancing the capacity of existing market players to operate effectively within restoration value chains. The lack of robust support structures for small enterprises also discouraged investment from private actors.

Malawi
In Malawi, weak value chains for forest products limited private participation. Smallholder farmers lacked access to markets for tree products, and private companies showed little interest in investing in community-led restoration.

Rwanda
In Rwanda, private sector engagement was stronger, particularly through energy-related woodlots, but many companies focused on short-term returns. Incentive mechanisms to support biodiversity-friendly restoration were still underdeveloped.

9.3.3 Land use conflicts

Cameroon
Competition between agricultural expansion and forest protection was acute in Cameroon, particularly in cocoa-growing regions. Conflicts also arose over access to sacred forests, with younger generations sometimes challenging restrictions imposed by traditional leaders.

Kenya
Land use conflicts, especially those involving human-wildlife interactions, presented serious challenges to project activities. Crop raiding by wildlife contributed to food insecurity and deepened poverty in some of the already vulnerable communities. In response, the AREECA project worked with conservancy leadership and the NEMA to mitigate these issues, particularly around sustainable water abstraction and landscape planning. These efforts aimed to balance conservation goals with the livelihood needs of the local population.

Malawi
In Malawi, land use conflicts were evident in areas where grazing and cultivation overlapped with restoration zones. Farmers were reluctant to restrict land use when immediate food security was at stake.

Rwanda
In Rwanda, high population density created frequent competition between agriculture and restoration, especially on steep slopes where cultivation is risky but essential for livelihoods.

9.3.4 Intersectoral cooperation on land tenure

Land tenure represents one of the most complex challenges for FLR, as it determines who has the rights, responsibilities, and incentives to manage land and forest resources sustainably. In many African countries, tenure systems are characterized by overlapping statutory and customary rights, fragmented responsibilities across ministries, and inconsistent enforcement. These conditions often undermine restoration by creating uncertainty for communities and investors, discouraging long-term commitments to sustainable land management.

The need for intersectoral cooperation is particularly acute, since tenure issues intersect with multiple policy areas (forestry, agriculture, water, and rural development) each governed by separate institutions with differing mandates. Without harmonization, interventions risk being delayed, contested, or reversed. In practice, many restoration projects struggle to navigate this institutional fragmentation, leading to a gap between political ambition and operational implementation.

AREECA encountered these challenges in several contexts. In Malawi, the introduction of multi-use forest blocks required negotiation between forestry authorities, district governments, and traditional chiefs, highlighting the importance of bridging stat-

utory and customary tenure systems. In Cameroon, the recognition of sacred forests demonstrated that cultural governance structures can be integrated into formal land-use planning, but only when supported by legal recognition and intersectoral dialogue. Kenya and Rwanda illustrated the difficulties of aligning land-use planning across agricultural and forestry sectors, particularly in densely populated areas where competing claims are strong.

The key lesson is that intersectoral cooperation on land tenure cannot be achieved through technical measures alone. It requires political will, participatory dialogue platforms, and legal reforms that clarify rights and responsibilities while protecting the interests of vulnerable groups. For FLR to succeed at scale, land tenure must be addressed as a cross-sectoral governance challenge rather than as a sector-specific issue.

10
Recommendations

10.1
Technical aspects

10.1.1 Site selection

Accurate and context-sensitive site selection is the foundation of successful FLR. Restoration measures are most effective when they are targeted to areas where degradation drivers are most acute, ecological recovery potential is high, and socio-economic conditions allow for sustained management and in apolitically table context. Site selection therefore requires an integrated approach that combines biophysical assessments, socio-economic and political analyses, as well as institutional considerations.

From a biophysical perspective, baseline studies must first identify the degree and type of degradation. Remote sensing tools (e.g., Landsat, Sentinel-2, or drone-based surveys) are increasingly used to map degraded areas, supported by ground-truthing and soil sampling. Criteria include vegetation cover, soil fertility, slope steepness, hydrological function, and connectivity to natural habitats. For instance, steep slopes above 30% gradient are highly erosion-prone and should be prioritized for SWC measures such as terracing or contour bunds. Literature suggests that contour bunds should be established every 1.5–2 meters of vertical fall on slopes between 15–35%, with reinforced vegetative strips for stabilization. Degraded riparian zones are best suited for agroforestry or riverbank stabilization using deep-rooted indigenous trees, while compacted rangelands require reseeding with perennial grasses combined with rotational grazing schemes.

The socio-economic dimension of site selection is equally critical. Areas must be chosen where communities are both willing and able to participate. Social Impact Assessments can help identify risks of exclusion, land-use conflicts, or short-term livelihood losses from measures such as area closures. Selecting sites in consultation with local user groups and traditional authorities, as done in Malawi's multi-use forest blocks or Cameroon's sacred forest mapping, ensures legitimacy and reduces the risk of contestation. Moreover, accessibility plays a role: roadside plantations and peri-urban sites often guarantee higher visibility, which helps mobilize political and financial support, while remote areas may be ecologically important but demand stronger institutional backing.

From an institutional angle, restoration sites should align with national and district development plans to guarantee continuity. The AREECA experience shows that site selection embedded in multi-stakeholder platforms (e.g., Kenya's Water Resource User Associations, Rwanda's District Environmental Committees) ensures that restoration is not a stand-alone intervention but complements agricultural, water, and forestry agendas.

A final but decisive factor is the goal orientation of restoration. If the primary driver is fuelwood scarcity, fast-growing exotics (e.g., eucalyptus spec., grevillea robusta) may be justified in community woodlots. If the goal is to restore ecological functionality, species selection must reflect the PNV to ensure biodiversity recovery and long-term resilience.

This "function-first" logic must be embedded already at the site-selection stage, since the ecological and social objectives determine which locations are most suitable for specific interventions.

AREECA examples illustrate this principle:

- In Rwanda, steep slopes were prioritized for terracing and agroforestry, directly addressing erosion as a key degradation driver.
- In Kenya, restoration targeted upper catchments of the Tana River Basin, linking ecological gains with downstream water supply security.
- In Malawi, degraded forest reserves were selected where governance reforms (co-management agreements) could ensure long-term compliance.
- In Cameroon, sacred forests were mapped and integrated into land-use plans, highlighting the role of cultural legitimacy in site prioritization.
- Recommendation: Future FLR initiatives should adopt a multi-criteria site selection framework, combining remote sensing, participatory assessments, and policy alignment. Sites must be chosen not only for their ecological degradation but also for their restoration potential, community acceptance, and governance feasibility. By embedding social, ecological, and institutional criteria, site selection becomes a strategic entry point for ensuring sustainability, scalability, and long-term impact.

10.1.2 Land degradation

Addressing land degradation is at the core of FLR, as degraded soils, vegetation, and water cycles undermine both ecosystem services and human livelihoods. Effective interventions must be carefully matched to the specific type and severity of degradation. Technical standards, ecological functionality, and socio-economic acceptability all determine whether interventions are successful and sustainable.

Steep Slopes and Soil Erosion

On steep slopes, erosion is the dominant degradation process, leading to nutrient loss, declining agricultural productivity, and increased flood risk downstream. Literature suggests that soil erosion rates increase exponentially on slopes above 15%, with critical thresholds at 30% where farming without stabilization becomes unsustainable (Morgan, 2005).

Key interventions include:

- Terracing (radical and progressive terraces): Applied on slopes above 25–30%. Radical terraces reshape the slope into level platforms, while progressive terraces use vegetative strips to gradually form terraces over years.
- Contour bunds and hedgerows: Bunds (earthen embankments) should be placed at intervals of 1.5–2 m vertical distance on 15–35% slopes (Critchley & Siegert, 1991). Hedgerows of vetiver or napier grass reinforce these bunds, adding fodder value.
- Mulching and cover crops: Reduce splash erosion and improve soil moisture retention.
- AREECA example: In Rwanda, radical terraces combined with agroforestry trees (Grevillea robusta, Markhamia lutea) reduced erosion by >40% and increased maize yields. Community ownership was supported by linking terraces with the CECF.

Sustainability:

- Ecological: Restores soil fertility, reduces sedimentation.
- Social: Labor intensive but creates employment during construction.
- Economic: High initial cost but long-term productivity gains

Rangeland Degradation and Overgrazing

In semi-arid zones, overgrazing and trampling cause soil compaction, loss of vegetation cover, and desertification. Without intervention, rangelands lose fodder productivity and carbon storage capacity.

Key interventions include:

- Grass reseeding: Using drought-tolerant native species (e.g., Rhodes grass, buffel grass). Requires temporary closure (6–12 months).
- Rotational grazing: Pastures divided into paddocks, with resting phases of 30–60 days to allow regrowth.
- Soil and water retention structures: Micro-catchments, zai pits, or semi-circular bunds capture water and aid grass establishment.
- AREECA example: In Kenya's Amboseli-Chyulu landscape, rotational grazing agreements were introduced, combined with reseeding using native grasses. Pasture productivity increased significantly, while conflicts between pastoralists and conservation authorities declined.

Sustainability:

- Ecological: Restores vegetative cover, improves infiltration.
- Social: Requires strong community agreements to enforce closures.
- Economic: Low-cost once agreements are in place; improved livestock health enhances household incomes.

Riparian Degradation and Wetlands

Riverbanks and wetlands are often degraded by farming, sand mining, and tree cutting, leading to siltation and loss of water quality.

Key interventions include:

- Riparian buffers: Planting strips of native trees/shrubs (30–50 m on each side of rivers, FAO 2012).
- Spring protection: Small catchment protection zones fenced and planted with deep-rooted indigenous trees.
- Wetland restoration: Rewetting drained wetlands, blocking drainage ditches, and replanting sedges and papyrus.
- AREECA example: In Kenya, restoration along tributaries of the Upper Tana Basin improved water quality for Nairobi Water. Partnerships with water utilities created a PES mechanism, directly linking restoration to urban water security.

Sustainability:

- Ecological: Critical for biodiversity corridors, sediment control, and groundwater recharge.
- Social: Restricts short-term cultivation, requiring alternative income measures.
- Economic: Strong case for PES models when downstream users (e.g., utilities) benefit financially.

Forest Degradation and Fuelwood Dependence

Deforestation for fuelwood and charcoal is a major driver across AREECA countries.

Key interventions include:

- Community woodlots: Fast-growing species (e.g., eucalyptus, grevillea) established near villages to supply biomass.
- ANR: Protection of degraded forest patches to allow regrowth of native species.
- Energy-efficient cookstoves: Reduce household fuelwood demand by 40–60%.
- AREECA example: In Malawi, woodlots under co-management agreements provided fuelwood while conserving core forest zones. In Rwanda, efficient stoves reduced fuelwood demand per household by ~50%, directly alleviating pressure on surrounding forests.

Sustainability:

- Ecological: Balances immediate biomass needs with long-term forest recovery.
- Social: High acceptance when linked to tangible benefits (energy savings).
- Economic: Low-cost technology with immediate household-level returns.

Cross-Cutting Lesson

Land degradation cannot be addressed by single interventions. AREECA shows that matching intervention type to degradation driver is the only way to achieve ecological and social sustainability. Technical guidelines (e.g., slope thresholds for terraces, minimum buffer widths for riparian zones) must be applied rigorously, while ensuring community participation and livelihood co-benefits.

Recommendation: Future FLR programmes should employ a decision tree for land degradation types, linking diagnostic indicators (slope, vegetation cover, soil fertility, land use) to the most appropriate restoration measure. This structured approach ensures interventions are both technically sound and socially acceptable, providing a model for scaling in diverse ecological and governance contexts.

10.1.3 Social aspects

Social dimensions are central to the success of FLR. Even technically sound interventions fail if they are not socially accepted or if they exacerbate inequalities. A Social Impact Assessment is therefore an indispensable part of site planning and intervention design. Social Impact Assessments ensure that restoration activities are adapted to local realities, minimize negative impacts, and generate equitable benefits. It also creates transparency and strengthens community ownership, which is crucial for long-term sustainability.

Participation and Community Ownership

Effective FLR depends on active involvement of local communities in decision-making. Top-down interventions risk resistance, poor maintenance, or even active sabotage. Participatory processes allow communities to identify their own priorities, link restoration to livelihoods, and negotiate trade-offs. Tools such as PRA, focus groups, and community mapping have proven useful for identifying degraded sites and selecting appropriate FLR measures.

In Malawi, the co-management of multi-use forest blocks was based on extensive dialogue with village natural resource committees and chiefs. This participatory approach allowed for locally accepted rules on grazing, wood harvesting, and fire prevention, creating a sense of ownership and responsibility.

Conflict Sensitivity and Land-Use Trade-Offs

Restoration often imposes short-term restrictions on land use like area closures, grazing limits, or reduced fuelwood collection, which can generate conflicts. Without conflict-sensitive planning, these measures can intensify disputes between community groups, or between communities and government authorities. Social Impact Assessments should therefore systematically assess who gains and who loses from specific interventions. Conflict mapping, stakeholder analysis, and negotiation platforms help to anticipate tensions and design fair compensation or alternatives.

In Kenya, rotational grazing schemes required agreements between herder groups with overlapping rangeland claims. The project facilitated dialogue through Water Resource User Associations, reducing disputes and establishing agreed grazing calendars.

Gender and Social Inclusion

Gender inequality and the exclusion of vulnerable groups (youth, minorities, landless households) are recurrent challenges in natural resource management. Women, for example, are often the primary users of forest products (fuelwood, fodder, water) but underrepresented in decision-making structures. Social inclusion strategies must ensure that restoration does not reinforce inequalities but actively contributes to empowerment.

Technical measures can be tailored to maximize inclusivity. For instance, energy-efficient cookstoves reduce women's workload and health risks, while agroforestry with fruit trees provides income opportunities for women and youth. Structured quotas or bylaw provisions can guarantee representation in decision-making bodies.

In Rwanda, the CECF prioritized loans to women and youth groups that complied with environmental agreements, directly linking social inclusion with restoration incentives.

Livelihood Integration

Restoration measures are more sustainable when linked to concrete livelihood benefits. Households facing immediate subsistence needs cannot be expected to invest in long-term ecological goals without short-term returns. Social Impact Assessments must therefore identify opportunities to integrate income-generating activities into restoration plans like beekeeping, tree nurseries, or non-timber forest product value chains.

In Cameroon, recognition of sacred forests was coupled with support for non-timber forest enterprises ensuring that communities derived tangible benefits while respecting cultural traditions.

Sustainability Dimensions

- Ecological: Socially accepted rules reduce illegal encroachment and enhance ecological effectiveness.
- Social: Participatory planning fosters equity, reduces conflict, and strengthens trust between communities and authorities.
- Economic: Linking restoration with income-generating activities ensures households perceive direct benefits, motivating long-term engagement.

Recommendation

Future FLR initiatives should institutionalize Social Impact Assessments as a standard step in project planning, alongside biophysical diagnostics. Social Impact Assessments s must cover participation, conflict sensitivity, gender and inclusion, and livelihood integration. Embedding social criteria in decision-making ensures that restoration is not only ecologically sound but also socially just and economically viable. Scaling such approaches requires clear guidelines, training for facilitators, and integration into national FLR strategies, so that social sustainability becomes a non-negotiable element of restoration planning.

10.1.4 Complementation of FLR implementing entities

The success of FLR depends not only on technical soundness or community engagement but also on the institutional constellation of implementing entities. Restoration is inherently multi-sectoral: forestry, agriculture, water, energy, and rural development all converge on the same landscapes. No single actor can address this complexity alone. Instead, effective FLR requires that different institutions contribute their complementary strengths and avoid duplication or competition.

AREECA demonstrated how such complementarities can be leveraged when roles are clearly defined and mutually reinforced. International NGOs often act as technical facilitators, providing expertise on ecological methods, community mobilization, and monitoring systems. Governments, by contrast, bring legitimacy and ensure that restoration activities are embedded in national frameworks and budgets, which is essential for long-term sustainability. Research institutions add another layer, by generating evidence, developing locally adapted methodologies, and providing training for practitioners. Finally, the private sector contributes through investment, innovation, and market linkages, especially where restoration intersects with value chains such as timber, fruit, or water services.

Examples from AREECA underline this interplay. In Rwanda, government leadership ensured that terracing and agroforestry were scaled through district development plans, while NGOs facilitated training and access to finance for farmers. In Malawi, the co-management of forest blocks only succeeded because forestry authorities provided legal recognition, communities enforced local by-laws, and civil society actors mediated between the two. Kenya's water funds showcased another type of complementarity, where downstream utilities financed upstream restoration, NGOs acted as intermediaries, and government institutions created the enabling legal environment. In Cameroon, cultural leaders safeguarded sacred forests while external actors provided the technical tools for mapping and formal recognition.

Such complementarities are not free of tension. Coordination challenges, overlapping mandates, or competition for funding can undermine collaboration. Nevertheless, the lesson is clear: FLR functions best where institutions are not expected to do everything but instead contribute what they do best, in a division of labour that builds on comparative advantages.

Recommendation:
Future programmes should institutionalize mechanisms that make these complementarities explicit; through memoranda of understanding, joint planning platforms, or shared monitoring frameworks. By clearly distributing roles and aligning contributions, FLR partnerships can achieve outcomes that no single entity could deliver in isolation.

10.2
Decision on FLR types

The decision on which FLR intervention to apply depends on a careful diagnosis of land degradation type, slope, soil fertility, water availability, and social priorities. Below is a decision-support table that can serve as a simplified "decision tree" for practitioners.

Site Condition	Driver of degradation	Recommended FLR intervention	Technical Criteria thresholds	Example from AREECA
Steep slopes (>15 – 30%)	Soil erosion, nutrient loss	Terracing (radical or progressive), contour bunds with vegetative strips	Bunds every 1.5 – 2m, vertical fall, terraces above 25- 30% slopes	Rwanda/Cameroon: radical terraces with agroforestry reduced erosion
Gentle slopes (5-15%)	Surface runoff, moderate erosion	Agroforestry, contour planting, mulching	Integration of multipurpose trees (fruit, fodder, N- fixing) between crops	Malawi: agroforestry increased yields and reduced soil loss
Degraded rangelands/ drylands	Overgrazing, compaction	Reseeding with native grasses, rotational grazing, area closures	Temporary closure 6-12 months; reseeding with drought- tolerant species	Kenya: rotational grazing agreements improved pasture productivity
Riparian zones wetlands	Cultivation, deforestation, sand mines	Riparian buffers, spring protection, wetland rewetting	Buffer strips 30- 50m on riverbanks; planting deep- rooted species	Kenya: riparian planting improved Tana River water quality
Deforested community areas	Fuelwood extraction	Community woodlots (fast growing exotics or mixed species)	Species selection depends on goal: exotics for fast biomass; natives for ecological restoration	Malawi: woodlots reduced pressure on forest reserves
Sacred/ culturally important forests	Encroachment, lack of formal protection	Community – based protection, mapping, legal recognition	Integration into local by-laws and land use plans	Cameroon: sacred forests formalized under community conventions
Urban/ roadside areas	Deforestation, low visibility of FLR activities	Roadside plantations, urban greening	Use fast growing drought tolerant trees; design for visibility and awareness	Rwanda: roadside planting liked to urban beautification campaigns.

Tab. 1: Decision on FLR type

Recommendation

Restoration planning should adopt such a diagnostic decision framework. By systematically linking site conditions with intervention types, programmes avoid one-size-fits-all solutions and ensure measures are technically, socially, and ecologically appropriate. This decision tree can be further developed into GIS-based tools for planners, where field data and satellite imagery automatically suggest suitable FLR interventions.

10.3 Follow-up and Long-Term Vision

FLR is a long-term process; ecological recovery and social transformation cannot be achieved within a typical project cycle. Effective restoration requires structured follow-up mechanisms that ensure continuity after the initial establishment of interventions. Monitoring should not only assess tree survival or soil stability in the first years but also track medium- and long-term impacts on biodiversity, ecosystem services, and livelihoods. This demands adaptive management frameworks where monitoring results directly inform corrective actions.

AREECA has shown that community structures such as Village Natural Resource Committees in Malawi or District Environment Committees in Rwanda are well suited to carry responsibilities for long-term management, provided they receive adequate training and modest financial resources. Embedding follow-up responsibilities in local governance systems increases legitimacy and resilience against staff turnover or political change.

From a sustainability perspective, the long-term vision of FLR must go beyond hectares restored and instead focus on functional landscapes that balance ecological integrity with productive land use. This requires strong links to climate strategies (NDCs), biodiversity targets, and national development agendas. Future programmes should therefore formalize exit strategies that hand over responsibilities to local actors while maintaining a regional or national support architecture for guidance and technical backstopping.

10.4 Scaling of FLR interventions

Scaling is often cited as a challenge, as many successful pilots remain isolated. To scale effectively, interventions must be technically replicable, socially acceptable, and economically viable. AREECA has provided evidence that scaling is possible where restoration is embedded in existing governance systems and supported by sustainable financing.

For example, Kenya's water fund model linked upstream restoration with downstream water utilities, creating a financing stream that can expand beyond individual sites. In Rwanda, the integration of terraces and agroforestry into district plans provided the policy anchor for replication across entire provinces. Malawi's co-management agreements allowed scaling by creating a standardized framework that could be replicated in other forest reserves with minimal adaptation.

The critical lesson is that scaling requires both a horizontal approach (replicating interventions across similar ecological and social contexts) and a vertical approach (embedding them into national policy and financing structures). Without both, scaling remains ad hoc and vulnerable to external shocks. Future FLR must therefore invest in scaling pathways that are intentionally designed from the start, supported by capacity building and continuous peer-to-peer learning across regions.

10.5 Exit strategy

An effective exit strategy ensures that restoration outcomes continue after donor-funded projects end. Exit strategies should be based on three pillars: (1) strengthening local ownership and governance structures, (2) ensuring sustainable financing, and (3) embedding interventions in policy frameworks.

AREECA's experiences underline the importance of gradual handovers. In Cameroon, sacred forest protection was first facilitated by NGOs but progressively anchored in community conventions and municipal land-use plans. In Rwanda, the CECF created financial incentives that continued to function beyond the project's direct involvement. In Malawi, forest co-management agreements provided the legal framework for continued community stewardship once external support was phased out.

A strong exit strategy must be planned from the outset, not as an afterthought at project closure. By identifying local institutions and financing mecha-

nisms early on, FLR can secure its legacy and ensure that ecological gains are not reversed.

10.6 Organizational and administrative recommendations

10.6.1 Communication

Clear and consistent communication is a prerequisite for effective FLR implementation. Restoration touches multiple sectors and stakeholders, without a common understanding, interventions risk fragmentation. Communication strategies must therefore operate on three levels: internal communication among implementing partners, vertical communication between national authorities and local actors, and external communication to the broader public and donors.

AREECA highlighted the value of structured communication platforms. In Kenya, quarterly stakeholder meetings ensured that technical updates were translated into practical guidance for field teams. In Rwanda, community radio proved essential for informing farmers about agroforestry techniques and mobilizing participation. Visual communication, such as participatory maps or before-and-after satellite imagery, helped illustrate progress and maintain motivation.

Recommendation: FLR programmes should institutionalize communication strategies that go beyond reporting, using dialogue formats, visual tools, and multi-language channels to strengthen ownership and accountability.

10.6.2 Knowledge transfer

Knowledge transfer is central to scaling restoration. Without systematic learning and dissemination, best practices remain localized. AREECA demonstrated the effectiveness of peer-to-peer learning through expert exchanges, South-South visits, and training of trainers. For instance, Ethiopian experts in SWC shared their technical standards with Malawian counterparts, while Kenyan practitioners introduced payment-for-ecosystem-service models to colleagues from Rwanda.

Knowledge transfer should also leverage digital platforms. Interactive knowledge hubs, standardized toolkits, and open-access monitoring data can ensure that innovations spread quickly. Yet, face-to-face exchanges remain indispensable, particularly where context-specific adaptations are needed.

Recommendation: Future programmes should combine digital repositories with structured learning alliances and exchange visits, ensuring that knowledge is both technically robust and socially embedded.

10.6.3 Policy recommendations

Policy frameworks set the conditions under which restoration can succeed or fail. Fragmented or contradictory policies (e.g. conflicting mandates between forestry and agricultural authorities) often undermine local initiatives. AREECA showed that policy alignment can unlock scaling: in Rwanda, integration of FLR into district development plans provided political legitimacy and access to public financing.

At the same time, policies must balance ecological and livelihood objectives. Restrictive measures such as area closures require accompanying social policies (alternative grazing schemes, livelihood support) to remain viable. Policy recommendations must therefore go beyond technical prescriptions and address governance, rights, and equity.

Recommendation: FLR should be embedded in cross-sectoral national strategies, linked explicitly to climate (NDCs) and biodiversity (NBSAPs) frameworks. Policymakers should ensure that enabling legislation clarifies land tenure, incentivizes private sector engagement, and mandates long-term monitoring.

10.6.4 Role of the government

Government institutions hold a dual role in FLR: they are both regulators and facilitators. Their authority provides legitimacy to restoration initiatives, while their convening power ensures coordination across sectors. Yet, governments often face capacity gaps at decentralized levels. AREECA demonstrated the importance of decentralized governance structures, such as district environment committees or village natural resource management bodies, which can bridge this gap when adequately resourced.

Governments also play a crucial role in mobilizing finance, whether through national budgets, green bonds, or climate funds. In Malawi, government endorsement of co-management agreements was critical to their acceptance; in Kenya, water utilities could only engage in PES schemes once government agencies provided a regulatory framework.

Recommendation: Governments should not be seen merely as overseers but as active partners in FLR. By investing in decentralized capacity, aligning restoration with national budgets, and creating enabling legal environments, they can secure long-term sustainability and accountability of restoration efforts.

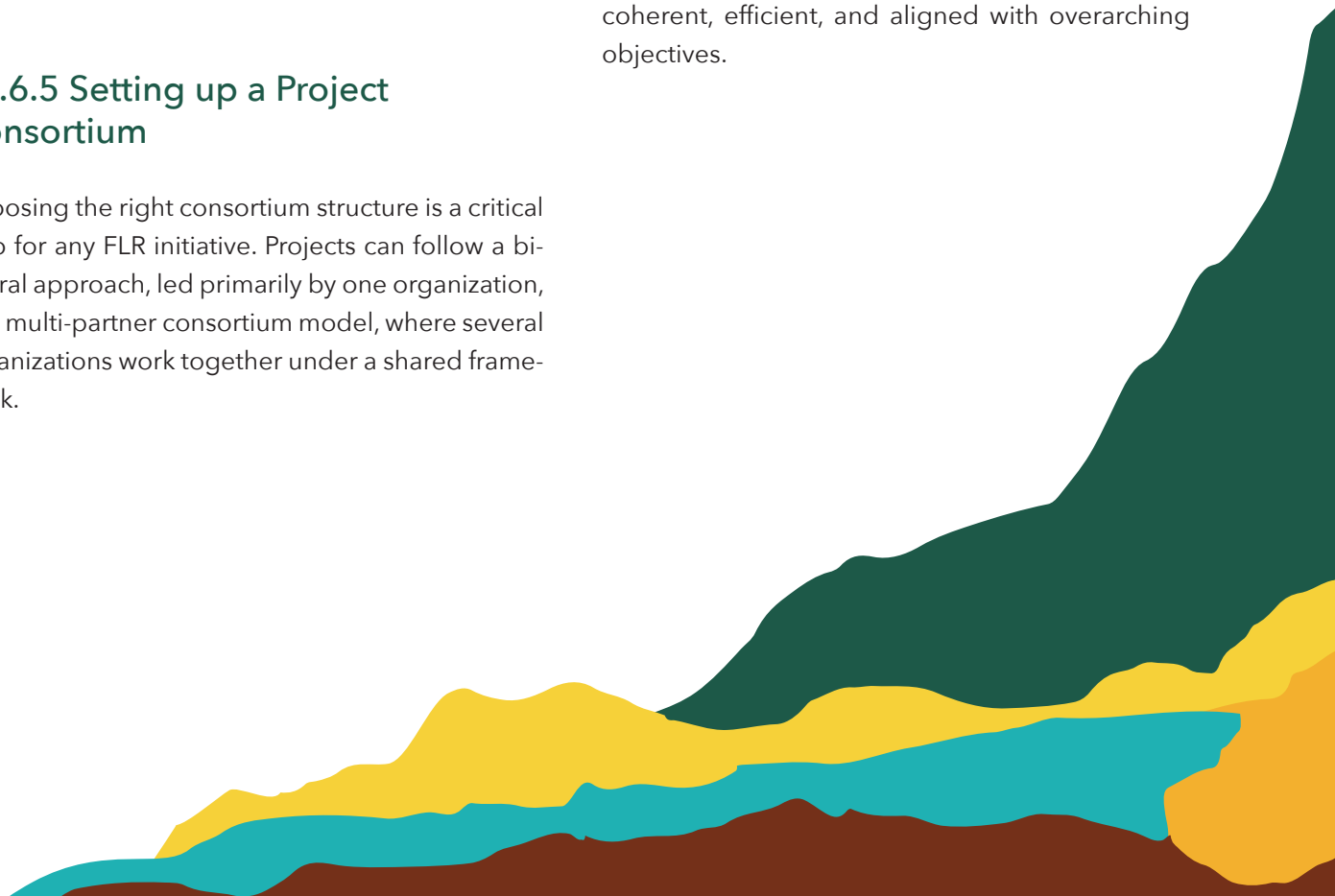
10.6.5 Setting up a Project Consortium

Choosing the right consortium structure is a critical step for any FLR initiative. Projects can follow a bilateral approach, led primarily by one organization, or a multi-partner consortium model, where several organizations work together under a shared framework.

Bilateral projects are often simpler to manage. Decisions can be made quickly, roles are clear, and accountability rests with a single institution. This model works well for scaling proven approaches or when strong internal coordination is essential. The trade-off is that it may limit technical diversity and reduce the sense of ownership among other stakeholders.

Consortium-based projects, as demonstrated by AREECA, bring together partners with complementary strengths. They provide broader expertise, greater credibility, and better access across different governance levels. They also allow knowledge sharing, joint learning, and more integrated approaches to restoration. At the same time, consortia need strong coordination, clear roles and responsibilities, and agreed procedures for reporting and budgeting. Without these, complexity can slow progress.

Recommendation: To maximize impact, FLR projects should establish a well-structured consortium from the outset. This includes setting up governance mechanisms early, defining partner roles and responsibilities clearly, and maintaining regular coordination meetings. Such practices ensure that the diverse strengths of multiple partners are effectively combined, while keeping project implementation coherent, efficient, and aligned with overarching objectives.



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Conclusion

The AREECA programme has demonstrated that FLR is both feasible and impactful when pursued through an integrated and multi-actor approach. Across the four focal countries FLR interventions addressed distinct drivers of degradation, ranging from shifting cultivation and fuelwood dependence to overgrazing and erosion on steep slopes. By tailoring interventions to local contexts while embedding them within broader policy frameworks, AREECA contributed not only to ecological recovery but also to livelihood enhancement and local economic development, governance innovation, and regional knowledge sharing.

One of the programme's central achievements lies in its ability to show that restoration must be more than tree planting. Terracing, rangeland reseeding, riparian buffers, and community woodlots all illustrate that restoration is a multifaceted process that must be grounded in both ecological realities and social needs. Technical methodologies were refined and adapted to each landscape, producing models that can be replicated elsewhere. At the same time, interventions such as the recognition of sacred forests in Cameroon or the development of payment-for-ecosystem-service models in Kenya highlight the importance of linking ecological goals with cultural and economic dimensions.

Another defining lesson is the role of partnerships and institutional complementarities. AREECA showcased how governments, NGOs, research institutions, private actors, and traditional authorities can each contribute unique strengths to restoration. Effective collaboration proved most successful where roles were clearly defined and supported by participatory platforms. The combination of community legitimacy, technical expertise, and policy embedding ensured that interventions were both grounded and scalable. However, the experience also revealed that coordination remains a persistent challenge, particularly where overlapping mandates or conflicting policies exist.

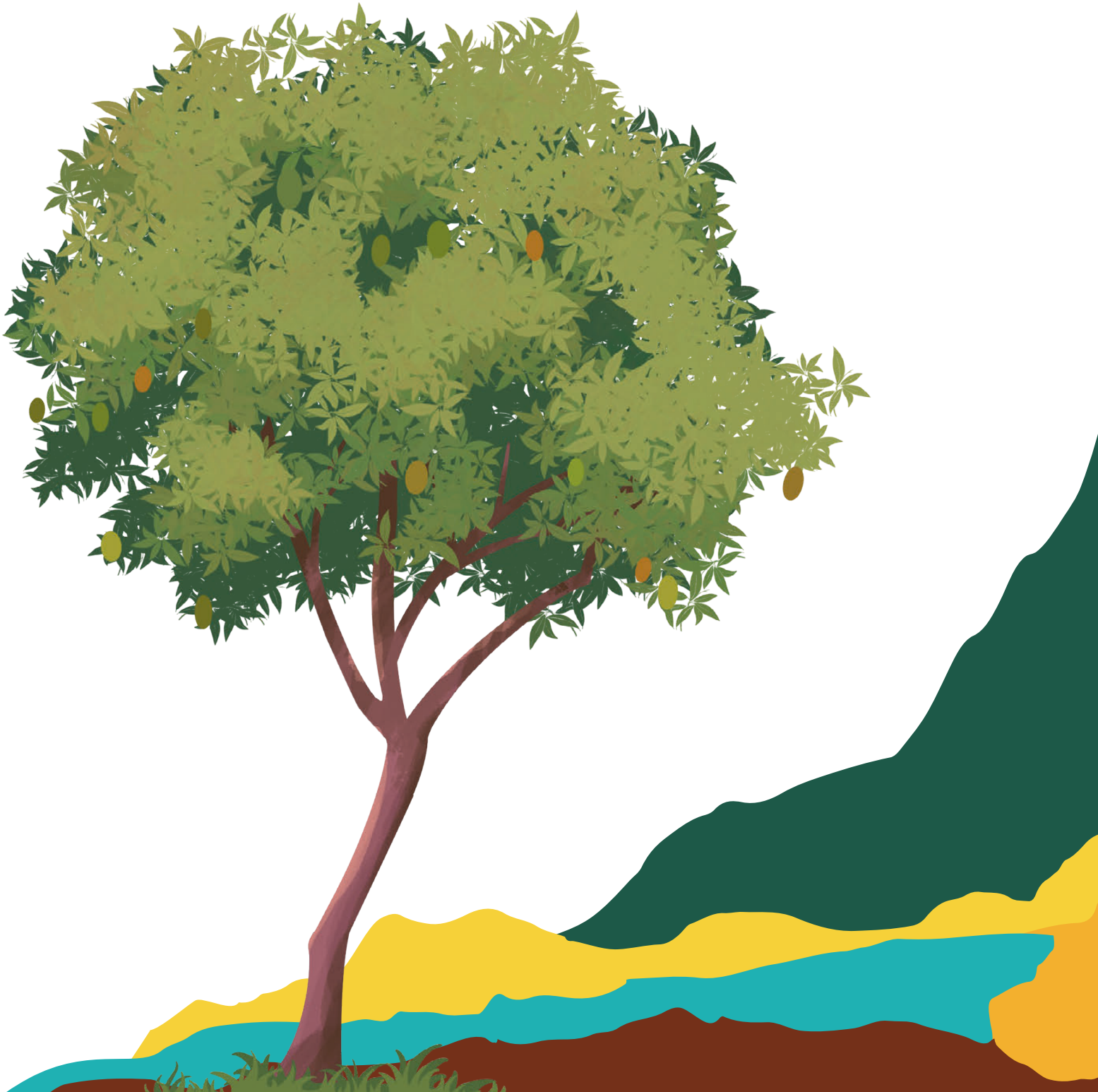
The programme further highlighted the importance of social inclusion and equity. Restoration cannot succeed if it excludes or disadvantages vulnerable groups. Women, youth, and marginalized households play critical roles in natural resource use and therefore must be actively engaged in restoration planning and benefit-sharing. AREECA's innovations, such as linking environmental compliance to microfinance schemes in Rwanda or providing alternative livelihood opportunities in Malawi, demonstrated how restoration can serve as a platform for social empowerment.

From a long-term perspective, sustainability hinges on institutionalization and financing mechanisms. Donor-funded projects alone cannot sustain restoration outcomes; exit strategies that transfer responsibilities to communities, businesses, local governments, and national authorities are essential. AREECA's approaches to co-management, community environmental funds, and PES schemes show promising pathways, but these need to be further anchored in national budgets and linked to international climate and biodiversity finance.

Finally, AREECA contributes to the broader continental and global agenda. Its results directly support the Bonn Challenge and AFR100 initiative, moving from political declarations to operational models that deliver measurable impacts. The programme's technical standards, governance innovations, and knowledge products provide a blueprint for other African countries and beyond.

In sum, AREECA offers compelling evidence that restoration works when ecological, social, and institutional dimensions are treated as interdependent rather than separate. The programme demonstrates

that degraded landscapes can be transformed into resilient socio-ecological systems, if interventions are carefully matched to context, ownership is fostered at all levels, and financing is secured beyond project lifecycles. These lessons provide not only closure for AREECA's first phase but also a roadmap for future restoration efforts in Africa and globally.



Annex 1

Further reading material

Topic	Resource/link	Decription
Foundational FLR concepts	https://portals.iucn.org/library/sites/library/files/documents/2011-017.pdf	Global principles that define FLR and guide implementation
	https://www.bonnchallenge.org	Global FLR platform with restoration commitments, methods, and progress updates.
FLR Assessment & Planning Tools	https://iucn.org/resources/grey-literature/guide-restoration-opportunities-assessment-methodology-roam	Standard methodology for identifying and prioritizing restoration opportunities
	https://www.wri.org/research/restoration-diagnostic	Framework for assessing institutional readiness and barriers to FLR scaling
Technical restoration guidance	https://www.fao.org/land-water/land/sustainable-land-management/slm-practices/en/	Technical description of SWC, agroforestry, rangeland restoration and related practices
WRI – Global Restoration Initiative	https://www.wri.org/initiatives/global-restoration-initiative	Global research and practical FLR guidance, including case studies.
Monitoring & Evaluation	https://openforis.org/tools/collect-earth	Remote-sensing tool for landscape monitoring and field data validation.
WRI – Land & Carbon Lab	https://www.landcarbonlab.org	Advanced datasets on land use, carbon fluxes and restoration progress.
AUDA-NEPAD – AFR100 Monitoring Resources	https://www.nepad.org/programme/african-forest-landscape-restoration-initiative-afr100	Continental FLR tracking guidance and country progress information
Climate & Carbon Accounting	https://www.fao.org/in-action/epic/ex-act-tool/suite-of-tools/ex-act/en/	Tool for estimating greenhouse gas impacts of land-use interventions
	https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html	Authoritative reference for emissions/removals from agriculture, forestry and land use.
Community Engagement & Governance – IUCN	https://iucn.org/resources/grey-literature/enhancing-integration-governance-forest-landscape-restoration	Approaches for inclusive, transparent and equitable FLR governance.
WWF- CBNRM Manual	https://wwfeu.awsassets.panda.org/downloads/cbnrm_manual.pdf	Practical guidance on community-based natural resource management.
Africa- specific FLR frameworks	https://afr100.org	African restoration commitments, resources and country information
	https://www.afr100.org/resources	Collection of Africa-focused FLR tools, policy briefs and case studies