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Reshaping the terrain
Forest and landscape restoration in Kenya

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Photo by Patrick Shepherd/CIFOR

Introduction

The Mau Forest Complex forms the largest closed canopy forest ecosystem in Kenya and is an asset of great national and regional importance. The complex supports a wide range of environmental services crucial for the socioeconomic development of the region. Despite its critical importance in sustaining current and future economic development, the forest has been adversely affected by extensive illegal, irregular and ill-planned settlements, in addition to illegal forest resources extraction. Kenya Forest Service (KFS), has been undertaking efforts to mitigate the effects of degradation with the ultimate aim of securing and sustainably managing the Mau Forest Complex.

Reforestation approaches

The objective was to restore degraded forest landscapes with a focus on participatory rehabilitation of water catchment areas and lost biodiversity. Specific interventions were dictated by degradation levels, germplasm availability, related cost, the size of degraded area and its proximity to an existing natural forest. In Mau, conditions ranged from bare soil to grasslands, bushlands, woodlands and modified natural forest. In Sururu and Likia forest blocks, interventions focused on areas with bare soil and modified natural forest.

Bare soil- mixed species planting

Interventions were prioritized in areas with bare soil resulting from illegal conversion from forest to crop cultivation. The exercise was conducted in partnership with the Mau-Sururu-Likia community forest association (MASULICOFA). Efforts included propagation of appropriate tree seedlings by communities with the guidance of local foresters. Preference was given to propagating pioneer species, which were subsequently purchased for rehabilitation purposes. This income generating activity for the communities served as an incentive towards embracing conservation efforts. Mixed species planting was undertaken, with species that previously colonized the area prioritised. Characteristically, a spacing of 4m x 4m was used, although this spacing was either increased or decreased depending on the level of degradation. After planting, the area was protected by community scouts who worked closely with KFS rangers. Spot weeding around planted saplings was done twice a year to remove competition. Protection also allowed natural regeneration to take place, thus accelerating the rehabilitation process. The regenerates were protected and maintained through spot weeding to allow for faster colonization. A total of 1,000 hectares of Sururu and Likia blocks were rehabilitated using this method.

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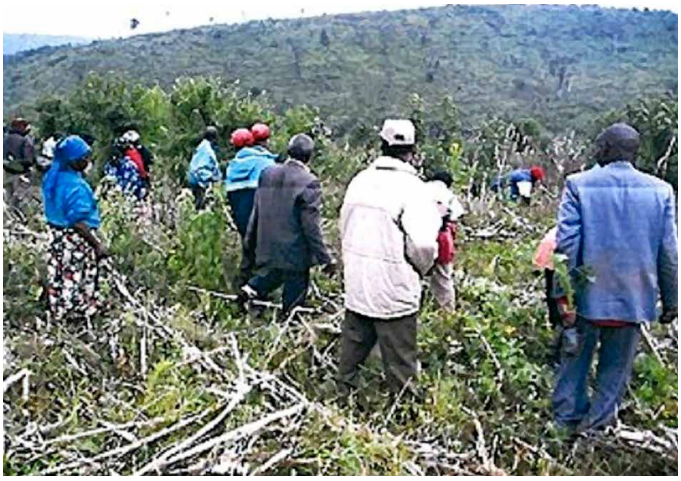

BEFORE: April 2007- Sururu-Likia Community Forest Association members planting indigenous tree seedlings in Sururuforest block.

AFTER: July 2018- Restored Sururu forest block

A fish pond at Sururufores t: One of the Income Generating Activities (!GA 's)provi ded to the CFA which motivated them to embrace conservation

Natural regeneration

This method was used in areas where natural forest was disturbed through illegal harvesting, leaving gaps in the forest cover. This method, which allowed the site to deliberately restore itself, is applicable where there are sufficient young regenerates such as wildlings, saplings and mother trees. The strength of this method is to encourage the young regenerates to grow to maturity at a considerable lower cost. The steps used for natural regeneration are summari zed below.

- Assessing the site to en sure there are adequate natural regenerating wildlings
- Determining whether competing species, such as invasive species, are present and assessing their prevalence
- Where competition appears to suppress the regenerates, removal of suppressants is done within a 1 meter radius
- Protection using community scouts and periodic monitoring to ensure sustainability of further intervention, e.g. removal of suppressa nts and reduction of risks of other degrading agents such as fire.

Using this method, a total of 1,500 hectares were restored in SuruE11Likia block.

Enrichment planting

This entailed planting tree species in a modified natural forest or secondary forest to create a high forest dominated by desirable species. Remnants of trees that originally colonized the area, combined with introduced species increased species diversity and population. Initially, an inventory was undertaken to determine species diversity. Using an adjacent intact forest or indigenous knowledge as the benchmark, the species that were not represented/ or underrepresented were thereafter introduced through gapfilling. Rare, threatened or species of high value were prioritized for introduction. Subsequently, protection by community scouts and KFS rangers was undertaken. In Sururu/Likia block, 1,500 hectares were rehabilitated.

Lessons learned

- Effectiveness of the method, whether natural or assisted, is dependent on the site condition at intervention. If it has been reduced to bare soil, then assisted is more effective because diverse, healthy seedlings will be more quickly established. However, this technique is more costly than natural regeneration. In areas where the forest is dominated by a considerable number of young regenerates and mother trees, tnatural regeneration will be more appropriate and less costly.
- Stakeholder participation in planning, execution and monitoring of project implementation is key

Constraints on reforestation and suggested remedial measures

Constraints	Suggested Remedial Measures
Drought	Strengthening early warning systems for reliable rainfall forecasting
	Prioritize drought-resistant species
Competing land use, especially forest vs. agriculture	Secure forests through acquisition of title deeds by the government
	Sensitization of forest-adjacent communities on critical ecological/ economic services offered by forests
	Participation of communities in forest conservation as key stakeholders
	Use of nature based incoming activities in forest areas to encourage forest conservation
Poverty	Incorporate income generating activities into forest conservation efforts to provide alternative livelihoods
	Use Payment of Environmental Services (PES) schemes to contribute to livelihoods
Livestock grazers interfering with regeneration	Establishing the carrying capacity of specific forest blocks Zoning of forest areas to protect areas earmarked for regeneration
	Intensified community policing in conjunction with government rangers
	Promote other more efficient I productive livestock rearing practices such as zero grazing
Invasive species	Develop a management regime/protocols and for invasive species control

to success, ownership and sustainability of forest conservation

- For communities to embrace forest conservation initiatives with sometimes intangible long term benefits (such as climate change mitigation), it is important to incorporate income generating activities as incentives to the conservation efforts.
- The prevailing social political environment within the area under consideration is key to the success of any rehabilitation activity.

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