



Good Practice No. 13

Restoration and Conservation of Mangrove Forests in Kilifi County

A Guide for Mangrove Forests Adjacent Communities and Extension Agents



Degraded mangrove ecosystem



Mangrove forest restored through planting

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1.0 Introduction

Mangroves are salt tolerant trees and shrubs that grow in intertidal zone of tropical and sub-tropical coastlines. Mangroves are important as they: control soil erosion; trap

sediments; enhance fishery productivity by acting as a nursery ground for fish, prawns and crabs; and act as habitats for aquatic life. Mangroves also store carbon and are among the

most carbon-rich forests in the tropics. The mangrove ecosystem also provides important goods and services to communities living adjacent to mangrove forests. However, provision of these goods and services is threatened by high rate of mangrove loss.

The main causes of mangrove ecosystem degradation include; overexploitation for wood products such as timber and fuelwood, pollution, coastal development, human settlement, and conversion to aquaculture. Effects of climate change such as a rise in sea level, and sedimentation also adversely affect mangrove ecosystems. To protect mangrove ecosystem from further degradation, there is a need to restore and conserve mangrove forests. Ihaleni Kakuluni Mangrove Conservation Group, located in Mavueni Takaungu location, Kilifi County, is one group involved in conserving and restoring mangrove forests within the county.

2.0 Objectives

- To conserve and restore degraded mangrove vegetation
- To improve communities income through enterprises associated with restored mangrove forest

3.0 Approach

Ihaleni Kakuluni Mangrove Conservation Group acquired skills in mangrove restoration from various institutions including; Kenya Forestry Research Institute (KEFRI), Kenya Marine and Fisheries Research Institute (KEMFRI) and Kenya Forest Service (KFS). Restoration of mangrove forests is done through planting and protection. Planting at degraded sites can be done through use of seedlings raised in the nursery, direct planting of propagules or use of wildlings.

To establish a mangrove nursery, mature propagules/seeds of appropriate species are collected directly from mangrove trees or from the forest floor and on the water, immediately

after falling from mother trees. Potting soil is collected from muddy to soft clay areas within the mangrove ecosystem and sometimes mixed with forest soil. The selected propagules are then planted directly into potted tubes by inserting one-third of the propagules into the potting media. The seedlings are then placed in the nursery and watered with sea water during dry periods. Propagules sprout within three weeks and can attain a height of 100 to 125 cm in 10 months. Where seed is used this can be sown directly into the potted bags or in seedbed and transferred to potted bags upon germination.

For direct planting, mature propagules, which are light green in colour and about 50 cm long, and have not yet rooted, can be planted directly in the degraded sites. Planting involves making shallow holes of about 10 cm deep in muddy to soft clay sites using sharpened sticks. Planting holes should be spaced at 0.5 m apart. The propagules are planted by inserting one-third of their length into the hole. Wildlings can also be planted directly in the degraded sites.

During planting, the Ihaleni Kakuluni Mangrove Conservation Group involves the whole community in the exercise. The Group has successfully restored about 20 hectares of mangrove forest. The group and the adjacent community members guard the mangrove forest and report any unauthorized activity to law enforcement agencies.



Mangrove propagules



Mature *Rhizophora mucronata* propagules



Mangrove nursery

4.0 Impact

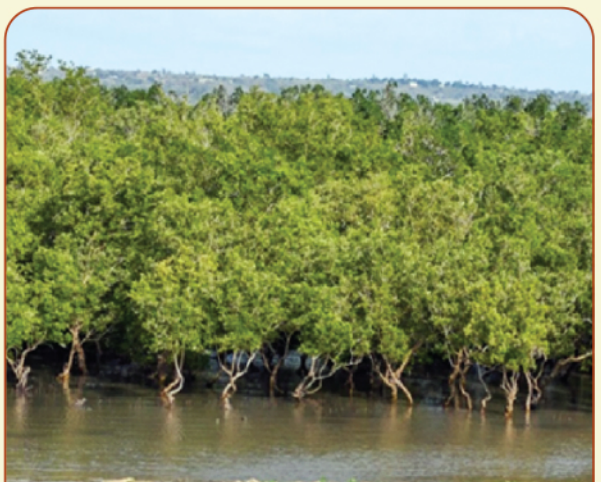
- Protection of coastal area as mangroves filter and trap sediment from run-off and river water before it reaches adjacent ecosystem reducing turbidity of the water
- Enhanced mangrove ecosystem stability
- Rehabilitated mangrove sites have restored habitat and breeding sites for marine life
- Sustainable provision of wood for timber, construction materials and woodfuel from mangroves
- Improved livelihood and income from sale of honey
- Improved aesthetic value of the degraded areas, creating recreation activities for eco-tourism



A beehive in a mangrove forest



Restored mangrove forest



A healthy mangrove forest

5.0 Sustainability

- Community involvement in mangrove forest restoration promotes ownership of forest by community members
- Income derived from restored mangrove forest is a motivation for continued restoration and conservation
- Enhanced awareness and training empowers more people to adopt mangrove restoration practice

6.0 Innovation

Additional livelihood activities that include: beekeeping supported by enhanced biodiversity and ecotourism

7.0 Constraints

- Intensive labour required to remove top soil from main land brought through erosion. This type of soil is not favorable for mangrove growth.

- Resistance from mangrove forest encroachers
- Inadequate policies to protect mangrove vegetation

8.0 Lessons Learnt

- Awareness creation on the importance of mangrove promotes community-based conservation and restoration
- Training communities on best practices for mangrove restoration encourages community participation

9.0 Conclusion

Mangrove restoration and conservation through community involvement is an effective approach as it promotes ownership, biodiversity and livelihoods improvement for the mangrove forest adjacent communities through provision of various goods and services.

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