



Republic of Kenya

MINISTRY OF ENVIRONMENT, NATURAL RESOURCES AND REGIONAL DEVELOPMENT AUTHORITIES

NATIONAL MANGROVE ECOSYSTEM MANAGEMENT PLAN



Summary for Policy Makers

2017 - 2027



APPROVAL PAGE

This mangrove management plan is approved for implementation and will be amended as need arises.

Emilio N. Mugo

DIRECTOR, KENYA FOREST SERVICE,

Date



20/2/2017

MANGROVE TECHNICAL COMMITTEE

Chairman	James G. Kairo	<i>Kenya Marine and Fisheries Research Institute</i>
Co-chair	Albert Nyabuti	<i>Kenya Forest Service</i>
Members	Agnes Mkazalla	<i>State Department of Fisheries</i>
	Mohamed Omar	<i>Kenya Wildlife Service</i>
	Mbuvu Musingo	<i>Kenya Forestry Research Institute</i>
	Mohamed Pakia	<i>Forest Conservation Committee – Coast</i>

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Recommended Citation. GoK (2017), National Mangrove Ecosystem Management Plan. Kenya Forest Service, Nairobi, Kenya

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1. Mangrove wood products, Gazi bay
2. A mangrove nursery, Gazi Bay
3. Mangrove planting campaign, Port Reitz
4. 20-year *Rhizophora* plantation, Gazi Bay
5. Fishing activity around mangrove area, Vanga
6. Students learning about the mangrove ecosystem, Gazi Bay
7. Mangrove ecotourism, Gazi Bay
8. Mariculture activity in a mangrove area, Kilifi Creek
9. Riverine mangrove with *Avicennia*, Mwache Creek

INTRODUCTION

For a long time, the management of mangrove resources in Kenya was based on harvesting of wood products and not on other essential roles that the ecosystem plays in; fishery production, climate change regulation, biodiversity conservation, and shoreline protection. Although this has improved considerably, lack of a management plan to guide utilization of mangrove resources has led to losses and degradation of mangrove ecosystem.



The World Bank, through Kenya Coastal Development Project (KCDP), supported the development of a National Mangrove Ecosystem Management Plan. The goal of the management plan is to enhance mangrove ecosystem integrity and its contribution to the economy of Kenya through sustainable management and rational utilization.

A nationally constituted Mangrove Technical Committee coordinated the development of the management plan for mangroves; with members drawn from lead government

institutions implementing KCDP. In addition, a member from Forest Conservation Committee was co-opted in the committee to represent community interests.

THE PROCESS

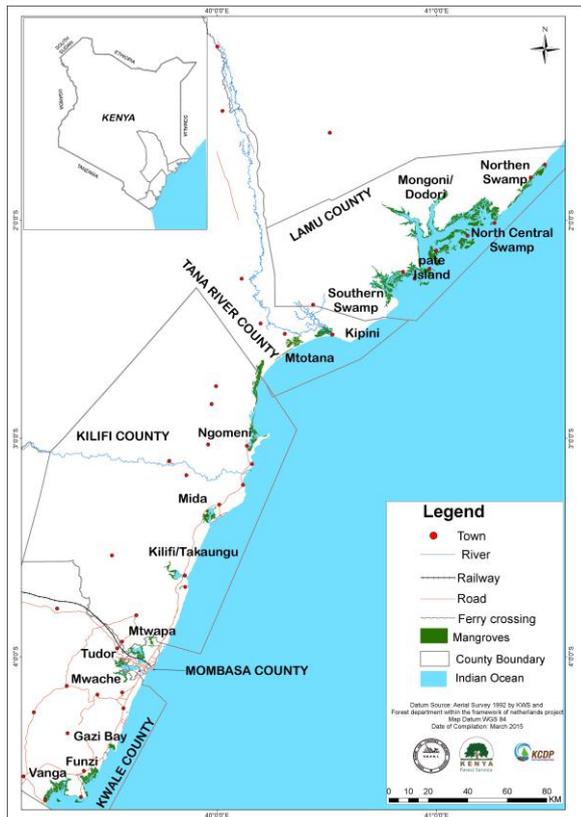
The technical committee worked consultatively through a series of workshops, fieldworks, literature reviews and personal contacts with expert groups, non-governmental organization, government agencies, local communities, and other stakeholders. Overall, 24 consultative meetings and workshops were held from August 2012 to October 2016. The initial drafts of the Plan were circulated to internal and external experts for reviews. A final national stakeholders' workshop was held in October 2016 to review and validate the Plan.

LEGAL STATUS OF MANGROVE FORESTS

Through Proclamation No. 44 of 30th April 1932, mangroves were declared government forest reserve. Under this "Gazette Notification for Mangrove Forests in Kenya" all land between high water and low water marks are described as mangrove areas. These forests are currently managed by the Kenya Forest Service (KFS) either alone; or with KWS when they fall in the marine protected area.

MANGROVE DISTRIBUTION

Mangrove forests are found in tidal estuaries, creeks, and protected bays along the entire Kenyan coastline (Figure 1).



These forests cover an estimated 61, 271 ha, representing only 3.0% of the national forest area. The largest coverage of mangrove forests occurs in Lamu County (61%) with Mombasa and Tana River Counties having the least (Box 1).

Box 1: Mangrove coverage in the counties along the Kenyan coast

County	Area (ha)	% cover
Lamu	37,350	61
Tana River	3,260	5
Kilifi	8,536	14
Mombasa	3,771	6
Kwale	8,354	14
Total	61,271	100

Figure 1: Mangrove distribution in Kenya

All the nine mangrove tree species recorded in the Western Indian Ocean (WIO) region occur in Kenya. The forest is however, dominated by *Rhizophora mucronata* (Mkoko) and *Ceriops tagal* (Mkandaa), that occupy more than 70% of the formation.



Figure 2: Artistic impression of the arrangement of different mangrove tree species along a tidal flat, typically known as zonation (Source VLIZ-KMFRI)

VALUING MANGROVE GOODS AND SERVICES

Mangroves provide goods and services that are of economic, ecological, and environmental value to the people. Using the broad Millennium Ecosystem Assessment (MEA) categories, the goods and services provided by mangroves in Kenya could be summarised as in Table 1.

Table 1: Mangrove goods and services

Usage category	Specific usage
Provisioning role	Wood products (building poles, fuelwood) Non-wood forest products (fishery, local medicine)
Regulatory	Shoreline protection; carbon sequestration; nutrient, pollutants and sediment filtration
Supporting services	Nutrient cycling, primary production, habitat, breeding grounds
Cultural services	Sacred sites, education, research, tourism, recreation

Based on empirical data, the total economic value of mangroves in Kenya has been estimated at more than KSh. 200,000 /ha/yr (Table 2).

Table 2: Valuation of mangrove ecosystem in Kenya

Product and services	KES ha ⁻¹ yr ⁻¹
Building poles	30,659.5
Fuelwood	4,505.0
Onsite fisheries	9,612.7
Beekeeping	1,249.5
Integrated aquaculture	408.0
Education & Research	65,469.6
Tourism	782.0
Carbon sequestration	21,896.0
Shoreline protection	134,866.1
Total	269,448.3

(Source: KMFRI)

**Plate 1:** Mangrove biodiversity at Mida Creek

(Source VLIIZ-KMFRI)

ROOT CAUSES OF LOSSES AND DEGRADATION OF MANGROVES

Mangrove forests in Kenya face a number of threats arising from both anthropogenic as well as natural causes. Between 1985 and 2009, the country lost about 20% of its mangrove

cover; translating to about 450 ha of mangrove area per year. At least 40% of mangroves across the coast are degraded (Table 3). Losses of mangroves are disproportionately higher in urban centres than in rural areas. In Mombasa County, for instance, the loss of mangroves is reported to exceed 80% in the last decade (Figure 3).

Table 3: Areal coverage of mangrove forest areas per county and the degraded proportion

County	Mangrove area (ha)	Degraded mangrove (ha)	% Degraded area
Lamu	37,350	14,407	38.6
Tana River	3,260	1,180	36.2
Kilifi	8,536	3,422	40.0
Mombasa	3,771	1,850	49.1
Kwale	8,354	3,725	44.6
Total (ha)	61,271	24,585	40.1

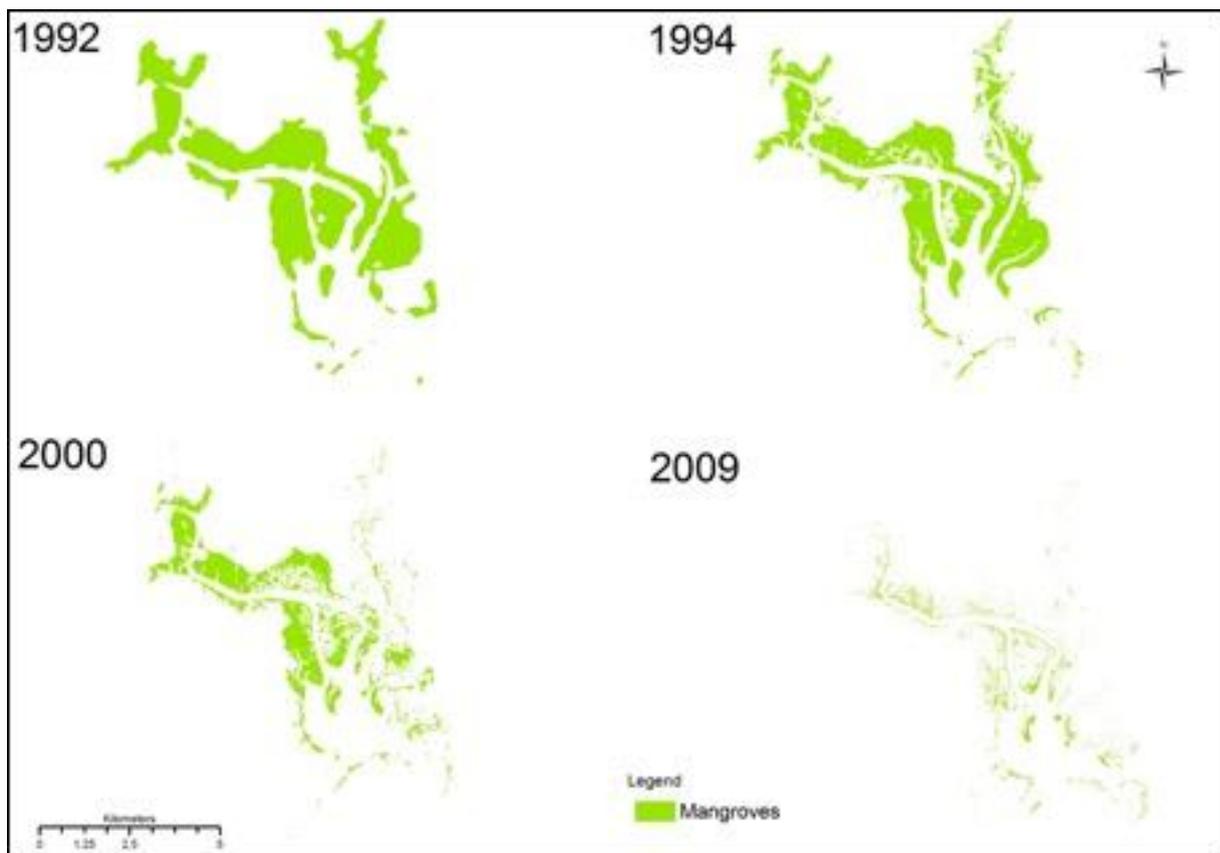


Figure 3: Mangrove cover change in Tudor Creek in the years between 1992 and 2009 (Source KMFRI)

The root causes of the loss and degradation of mangrove habitat have been identified as population pressure, poverty and inequality, low levels of education, economic development, and poor governance. Poor governance manifests itself in a range of management problems and deficiencies, and generates threats from forest encroachment, overexploitation of resources among other activities.

Based on the analysis of benefit and threats facing mangrove ecosystem in Kenya, six management programmes were developed to ensure an integrated approach to their management (Table 3). The programmes were developed based on the following objectives.

1. To **conserve and manage mangrove wood and non-wood resources** on a sustained yield basis;
2. To **manage and protect mangrove areas** for fisheries, erosion control, coastal stabilization and biodiversity conservation;
3. To **promote community participation** in mangrove resource management for improved livelihoods;
4. To **strengthen institutional capacities** of the institutions responsible for mangrove management;
5. To **promote tourism and recreation** in mangrove areas; and
6. To **promote research and education** on conservation and management of mangrove and associated ecosystem.

IMPLEMENTATION OF THE PLAN

The implementation of the national mangrove ecosystem management plan will take cognisance of various principles governing natural resources management, including; integrated ecosystem approach, gender parity, participatory management and equity among others. Director KFS remains the overall overseer of the implementation of mangrove management plan. A National Mangrove Management Committee (NMC) will be constituted, with membership of technical experts for mangrove ecosystem relevant disciplines, including; Forestry, Fisheries, Wildlife, Water, Land, and Climate, etc. The NMC will serve as advisory organ to inform HOC on the technical issues regarding mangrove management (Fig. 4). At least KES 3.8 billion will be required to implement the plan over a period of 10 years (Table 3). The main sources of finance will come from Government consolidated funds as well as from external partners.

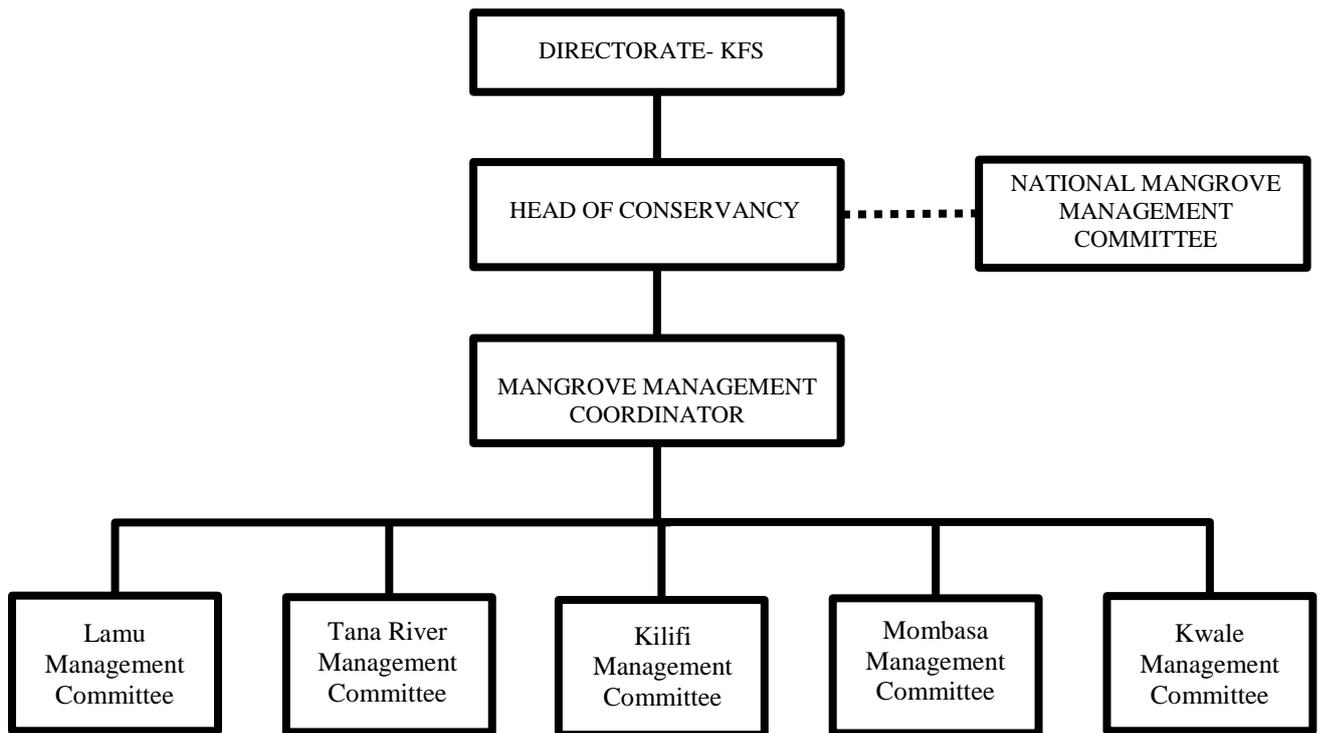


Fig. 4. Implementation Structure for the Mangrove Management Plan



Plate 2: Reforestation of degraded mangrove areas at Gazi Bay

(Source VLIZ-KMFRI)

Table 4: Summary of management programmes, purpose, and budget

Management programme	Programme purpose	Budget (KES) '000'000
Mangrove forest conservation and utilization	Ensure that forests are managed sustainably for wood and non-wood forests products while maintaining environmental integrity	817
Fisheries development and management	Sustainable management and conservation of mangroves as habitat and breeding grounds for fisheries and other wildlife	102
Community participation	Promote community participation and local institutional capacity in mangrove resource conservation and management for improved livelihoods and ecological integrity	566
Research and education	Promote conservation and management of mangrove ecosystems through problem oriented research, education and training	398
Tourism development	Enhance tourism development and management to maximize benefits and revenue streams, while safeguarding ecosystem integrity	527
Human resource and operations	Skilled motivated personnel, adequately equipped with appropriate tools and equipment to support best practise in mangrove management	1,411
Totals		3.8 billion



**For more information of the national mangrove ecosystem management plan, please
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