KENYA
Forest Service

MOMBASA MANGROVE FOREST PARTICIPATORY MANAGEMENT PLAN

2015-2019

UNDP SGP The GEF Small Grants Programme gef WWF KFWG OKICFA NATURECOM GROUP
linking Environment, People & Development

APPROVAL PAGE

MOMBASA MANGROVE FOREST PARTICIPATORY MANAGEMENT PLAN

This Management Plan is hereby approved; its implementation will be guided by the signed Forest Management Agreement between KFS Mombasa Kilindini Community Forest Association (MOKICFA) and will be based on approved annual work plans**.**

The plan may be amended as need arises through mutual agreement of both parties.

…….

Emilio N. Mugo

Director, Kenya Forest Service

Date……

ACRONYMS

ASL	Above Sea Level
CBD	Convention on Biological Diversity
CBOs	Community Based Organizations
CDF	Community Development Fund
CDTF	Community Development Trust Fund
CFA	Community Forest Association
CGM	County Government of Mombasa
CITES	Convention on International Trade in Endangered Species
EA	Environmental Audit
EC	Ecosystem Conservator
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
FCC	Forest Conservation Committee
FMU	Forest Management Unit
FUG	Forest User Groups
GEF	Global Environmental Fund
GDP	Gross Domestic Product
GFP	Global Forest Principles
HoC	Head of Conservancy
IGAs	Income Generating Activities
KEFRI	Kenya Forestry Research Institute
KFS	Kenya Forest Service
KFWG	Kenya Forest Working Group
KWS	Kenya Wildlife Service
LPT	Local Planning Team
MDGs	Millennium Development Goals
MOALFD	Ministry of Agriculture, Livestock and Fisheries
MOKICFA	Mombasa Kilindini Community Forest Association
MoU	Memorandum of Understanding
NBE	Nature Based Enterprises

NEAP	National Environment Action Plan
NEMA	National Environment Management Authority
NGOs	Non-governmental Organizations
NMK	National Museums of Kenya
NMMP	National Mangrove Management Plan
NWFP	Non Wood Forest Products
PES	Payment for Environmental Services
PFM	Participatory Forest Management
PFMP	Participatory Forest Management Plan
PIC	Plan Implementation Committee
REDD	Reducing Emission from Deforestation and Degradation
SGP	Small Grant Programme
SGR	Standard Gauge Railway
SHG	Self Help Group
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WG	Women Group
WRMA	Water Resources Management Authority
WRUAs	Water Resource Users Association
WWF	World Wide Fund for Nature
YG	Youth Group

FOREWORD

Mangrove forests are considered to provide essential functions and services to coastal zones, biodiversity and human populations. Natural resource management trends in the world are moving away from the predominantly earlier practiced protective 'plan and control' management approach to more collaborative and participatory management approaches. Kenya has adopted a Participatory Forest Management (PFM) approach to forest management allowing co-management of forest resources amongst Kenya Forest Service (custodian to Kenya forest) the community and partnering organizations and institutions. The change to forest management approach is driven by the need to promote sustainable use and management of forests in Kenya. The high demand for forest resource products and services because of increase in human population, and the ever-changing environmental conditions have rendered the present use and management of mangrove forests as a resource unsustainable. It is for this reason that Mombasa Kilindini Participatory Forest Management Plan (PFMP) is formulated.

The United Nations Development Programme (UNDP) GEF Small Grants Programme (SGP) through the Sustainable Management of the Mombasa County peri-urban Mangrove Forest, Kenya Project supported the development of this Participatory Forest Management Plan (PFMP). Through consultative meetings stakeholders including government agencies, Non Governmental Organizations (NGOs), private sector, expert groups, and community based groups played a significant role in preparation of the Plan by providing invaluable information to the Technical Working Group (TWG) that coordinated the development of this plan.

Dedan Nderitu
Head Conservancy
Coast

Lucas Fondo
Chairman MOKICFA

Albert Nyabuti
Ecosystem Conservator,
Mombasa

EXECUTIVE SUMMARY

The Forests Act also incorporated communities in the management of the forests through Community Forest Associations (CFA) framework. This enticed a participatory forest management and utilization process, this has brought to realization and appreciation by the community the notion of the forest as their own resource. It is further in recognition that the communities as custodians for forest resources. Sustaining forest resources remains promising with the communities as stewards for public resources and goods. It is from this background knowledge that informs the development of this Participatory Forest Management Plan.

This plan is intended to provide guidance in the management of Mombasa County mangrove resources in cognizance of other existing policies such as environment, agriculture, wildlife, water, land and land use, and the newly developed National Mangrove Management Plan (NMMP). The larger part of Mombasa County mangroves are peri-urban forest spreading from Mtwapa Creek, through Tudor, Changamwe, Kilindindini to Mwache. The plan also recognizes the inter-connectivity among ecological, social-ecological, socio-economic, cultural, and institutional arrangements.

For effective management of mangroves Mombasa County, the Plan has proposed six management programmes, including; biodiversity and ecotourism; forest extension; community conservation and socio-economic development; protection and security; infrastructure, plants and equipment; education, research and monitoring; and human resource development. These programmes are envisaged to provide measures for conservation, rehabiliation, and sustainable management of mangrove ecosystem while enhancing the livelihood of the local community.

The period of the approved plan will be 5 years commencing the date of approval. It will be implemented jointly by the Kenya Forestry Service, the Community Forest Association and relevant stakeholders based on the Forest Management Agreement (FMA) signed between the Director of Kenya Forest Service and Mombasa Kilindini Community Forest Association (MOKICFA).

ACKNOWLEGEMENTS

The development of this Management Plan was made possible through support from UNDP GEF Small Grants Programme. The Mombasa Kilidini Community Forest Association would like to recognize and appreciate the effort of Albert Nyabuti-Ecosystem Conservator, Mombasa County and Alex Kathuku-Management Plan Coordinator Coast Region both of the Kenya Forest Service for the technical guidance and input in the development of the MOKICFA PFMP.

In addition, MOKICFA would like to recognize and appreciate the efforts of John Kareko and Dishon Murage of NatureCom, Lucas Fondo of CLARION, Joseph Kibugi-Former Forester, Mombasa County and Ms Risper Oteke of Kisauni Environment Project for facilitating community consultations and as well as in the development of the draft PFMP.

We would also like to acknowledge the worthwhile contribution of members of the Technical Working Group who represented the below mentioned institutions in the development of the PFMP, among them Bamburi Lafarge Ecosystems; Kenya Maritime Authority; Kenya Wildlife Service; Mombasa County Government; NatureCom Group; Wildlife Clubs of Kenya; and Worldwide Fund for Nature.

Additionally, the production of the PFMP would not have been successful without the input from Mr John Macharia and Ms Anne Itubo both of KFS Head Office.

Local community contribution was vital in both the socio-economic and biodiversity surveys as well as in the participatory mapping exercise. Community contributions during the consultative meetings to develop the PFMP are also highly appreciated.

We are greatly indebted to the UNDP GEF SGP for funding support in the development of the draft PFMP and the Kenya Forest Working Group (KFWG) for their support in making the final stakeholders' validation workshop possible. Finally, since it is not possible to mention each person engaged in the development of the PFMP, we appreciate all the others who participated directly or indirectly in the preparation and completion of this document.

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CHAPTER 1: GENERAL INTRODUCTION

Mangroves have played a long and important role in the history of human activity on the East African coast. Records indicate that along with slaves and ivory, mangrove poles made up a major regional trade by the 9th Century. Mangrove exploitation for building poles forms a subsistence livelihood for local people the Kenya Coastal Counties, with highest dependence in Lamu County. For many years, house construction in Arab countries was dependent on mangrove poles brought by dhows (traditional Arab boats) from the East African coast.

1.1 JUSTIFICATION OF THE MANAGEMENT PLAN

The Forests Act, 2005, Section 35(1) states that "Every state forest, local authority forest and provisional forest shall be managed in accordance with a management plan that complies with the requirements prescribed by rules made under this Act". Section 46 strongly supports the participation of stakeholders in the conservation and management of the forest resources through collaborative management. The recognition of the communities adjacent to forests as key stakeholders and users of natural resources is a vital consideration if successful management is to be achieved. It is on this basis that communities living adjacent to the Mombasa mangrove forest wish to engage with the Kenya Forest Service in order to sustainably manage the forest. The management plan will give the communities a legal right to enter into an agreement with Kenya Forest Service to get rights to utilize the forest in a sustainable manner.

Although the preparation for a 10 year National Mangrove Management Plan (2015 – 2025) is in progress, it is necessary to develop an operational management plan for Mombasa Mangroves, which addresses the aspirations and wishes of all stakeholders and makes specific recommendations for implementation. The plan will also inform the managers and stakeholders in decision making while also providing a platform for conflict mitigation.

1.2 APPROACH TO PLAN DEVELOPMENT

A participatory and consultative process was applied to develop MOKICFA PFMP. The PFMP initiated through 'Sustainable management of the Mombasa County peri-urban mangrove forest, Kenya' project initiated in December 2013, and funded by the UNDP GEF SGP.

The project overall objective was to provide for sustainable use and management Mombasa County Mangrove forest while ensuring related biodiversity is protected to improve its integrity, function and productivity. Initial meetings to raise awareness on the proposed development of the PFMP were held with representatives from the communities, during the awareness meetings Local Planning Team (LPT) was formed with representatives from the communities and key stakeholders, thereafter followed by the establishment of a Technical Working Group (TWG). Training on PFMP guidelines was conducted to LPT for two days and this equipped them to carry out socio economic survey, biodiversity survey, resources mapping and zonation of the PFM area.

Development of the PFMP has followed a series of steps. The process was initiated by an experiential learning visit by the Local Planning Team (LPT) at Gede Forest in 2013 to familiarize with the PFMP process. Thereafter, A Technical Working Group was established in 2014 comprising with representatives of key institutions drawn from the both public the and private sector engaged in the management or utilization of the mangrove forest. A leaders' sensitization meeting was held in Mombasa to sensitize local leaders in December 2014. Leaders from Junda, Majaoni, Tudor, Mikindani, Mtongwe and Mwakirunge were sensitized on the planned PFMP. Community sensitization meetings on the planned PFMP process were conducted in Majaoni, Mishomoroni, Junda, Changamwe and Mwangala.

Trainings of the TWG on the PFMP process were conducted in December 2014 in preparation for development of PFMP draft format in early 2015. In addition, a participatory map of the Mombasa Kilidini Mangrove forest was developed in 2015 through facilitation and technical support from both MOKICFA and KFS. A small team comprised of members of the TWG was established and charged with the responsibility to develop a zero draft of the PFMP and share the same with the PIC and TWG in 2015. The Management Plan draft was finally shared with stakeholders through a stakeholder's workshop before the first draft submission to KFS Headquarters for final review and approval.

1.3 IMPLEMENTATION OF THE PLAN

The period for this Participatory Forest management Plan (PFMP) implementation will be 5 years from the date of approval. Kenya Forest Service (KFS) and the Community Forest Association (CFA) with the involvement of other relevant stakeholders will implement the plan jointly. All activities on establishment not limited to, management and conservation; issues relating to consumptive and non-consumptive forest products and benefits to stakeholders shall be in accordance with terms and conditions contained in the Forest Management Agreement (FMA). The Director of Kenya Forest Service and the Mombasa Kilindini Community Forest Association (MOKICFA) will sign the FMA.

The management plan adopts a continuous monitoring approach during the implementation phase. Where necessary, amendments will be undertaken and especially with the recommendation in the plans' midterm review. The plan is subject to review after 5 years. Any necessary amendments will be made in conformity with the plan objectives by KFS in consultation with other stakeholders.

1.4 Funding of the Management Plan

The funding of this management plan will partially comprise of direct budgetary allocation from KFS and support from stakeholders, development partners and well-wishers. Additional resources will be solicited from the users/beneficiaries of the forest resource. Where possible projects and sub-programmes will be developed around management plan programmes and specific activities, funding will be sought from the relevant donors.

CHAPTER 2: DESCRIPTION OF THE FOREST

2.1 GEOGRAPHICAL LOCATION, LEGAL AND ADMINISTRATIVE STATUS

Geographical Location

Mombasa has a 100 km long creeks coastline that runs from the Port Reitz Area in the south to the Mtwapa Creek in the north; between latitudes 3°56´South and 4°10´South and longitudes 39°34´E and 39°46´E (Fig 1). Mombasa county has 3, 769.7 ha, mainly dominated by *Ceriops* and *Rhizophora* species. The mangrove forests are distributed mostly along Tudor, Port reitz and Mwache Creeks.

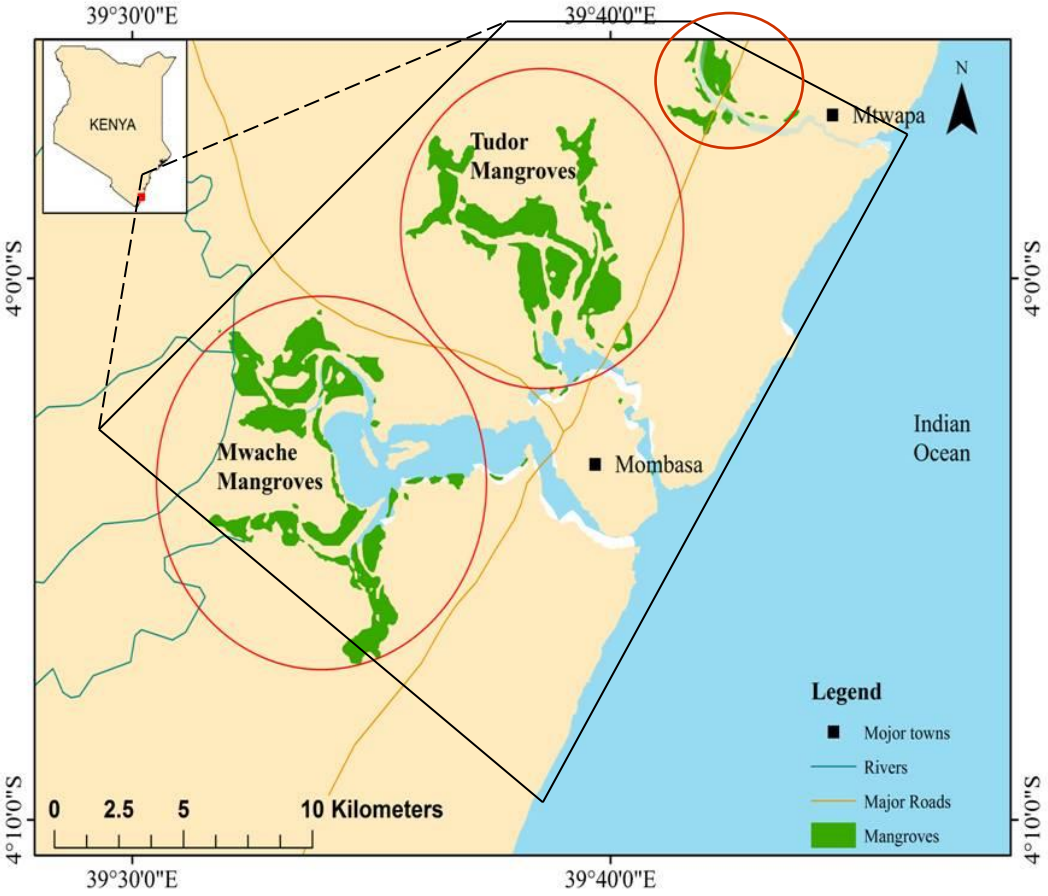

Figure 1: Distribution of Mangrove Forests in Mombasa County (*modified from* Bosire, *et al*. 2014).

Legal and administrative status

Mangroves were declared government reserve forests by the Proclamation No. 44 of 30 April 1932, and later by Legal Notice No. 174 of 20 May 1964. This "Gazette Notification for Mangrove Forests in Kenya" includes all land between high water and low water marks (ordinary spring tides) in the localities described below. On the mainland and islands adjacent to the coast from Kimbo Creek in the South, to the village of Kiunga on the mainland in the north; On the banks of Tana river (northern branch) between Kipini and Kao (Kau); On the mainland and islands to the coast from the mouth of the northern Kilifi river in the north, to RasNgomeni in the south; The following creeks and all branches thereof: Mida (Uyombo), Kilifi (Southern), Takaungu and Mtwapa; All tidal areas lying to the north west, west and south west of the straight line between Ras Kinangone (Flora point) at the entrance of Port Reitz, and Ras Junda (southernmost point mainland North at the entrance to Port Tudor, but excluding any portion of the shore of Mombasa island).

Administrative responsibilities to manage mangroves are bestowed on the Kenya Forest Service either singly, or in partnership with the Kenya Wildlife Service (KWS) when they occur in the marine protected areas (MPA). The Major management unit is the Ecosystem Conservator of forests in Mombasa. There are four KFS Sub Counties in Mombasa of which all at have mangroves (Table 1). The Ecosystem Conservator (EC) is vested with the responsibility for protection of the forest, issuance of harvesting permits and the collection of revenue.

Table 1: Administrative units of Mombasa mangrove

Sub County	**Creek**	**Block**	**Outposts**	**Remarks**
Kisauni	Mtwapa	Majaoni	-	Required
Likoni	Port Reitz	Port Reitz	-	Required
Island	Tudor	Junda	-	Required
		Tudor	-	Required
Changamwe	Miritini	Mkupe	Jomvu Kuu	Renovation or rebuild

2.2 BIOPHYSICAL DESCRIPTION OF THE FOREST

Climate

The coastal area of Kenya has a hot and humid tropical climate with temperatures ranging between 24°C and 30°C. Mean annual rainfall range between 500 and 900 mmyr-1 in the North Coast to between 1000 and 1600 mmyr-1 in the south. The relative humidity is constantly high throughout the year, with an optimum of up to 90% during the rainy season. The rainfall seasons at the coast are strongly influenced by the monsoon winds. Thre are two main rain seasons at the coast, the short and long rain seasons. The long rain season (March to May) occurs during the South East Monsoon while the short rains occur during the North East Monsoon (October to December).

Drainage Pattern

The mangrove forests are found within the soleline marking the sealevel (O-level altitude), and thus marking the drainage end point. One of the distinctive features of the Kenya coastal area is a fringing reef system that runs parallel to the coastline. Mwache, Kombeni and Tsalu rivers are three notable seasonal rivers in Mombasa draining in to the Indian Ocean. There are three permanent springs Mwachisinsa, Mlongondoni and Tembo. The mangrove forests occur within a number of distinct coastline geophysical categories of drowned river valleys at Mombasa and Mtwapa protective outcrops of coral limestone.

Soils and Geology

Coast line rises from sea level to 140 m. Soils in Mombasa areas are predominantly unconsolidated coraline, with poor water holding capacity and extreme alkalinity. The porous parent rocks of sedimentary origin generally give rise to soils of low fertility. However, patches of highly productive soils occur in areas of alluvial deposits.

MANGROVE BIODIVERSITY AND REHABILITATION

2.3. BIODIVERSITY (VEGETATION AND WILDLIFE)

Flora

Mangroves are salt tolerant woody plants that grow at the harsh interface between land and sea in tropical and subtropical regions. In Kenya, mangroves are found in creeks, bays and estuaries covering an estimated total area of 54,000 ha along the Kenyan coastline. There are nine species of mangroves found in Kenya; *Rhizophora mucronata, Avicennia marina, Ceriops tagal*, *Lumnitzera racemosa*, *Bruguiera gymnorrhiza*, *Sonneratia alba*, *Xylocarpus granatum*, *Xylocarpus moluccensis* and *Heritiera littoralis. R. mucronata, C. tagal* and *A. marina* are the dominant species making 70% of the formation. Mangroves in Mombasa display typical zonation pattern of the mangroves in Eastern Africa and the zonation is based on prominent trees and the seaward side is occupied by *Sonneratia-Rhizophora*-giant *Avicennia* community followed by *Rhizophora-Bruguiera-Ceriops* in the mid zone and dwarf *Avicennia-Lumnitzera-Xylocarpus* complex on the landward side. Table 2 indicates the intensity of mangroves and species percentage cover.

Table 2: Mombasa County mangrove formation

Mangrove formation in Mombasa County **Classification**	**Area (ha)**	% cover
Avicennia	464.9	12.3
Avicennia mix	76.5	2.0
Ceriops	317.7	8.4
Ceriops mix	127.2	3.4
Ceriops-Rhizophora	1,728.9	45.9
Rhizophora	201.9	5.4
Rhizophora mix	580.0	15.4
Sonneratia	99.6	2.6
Sonneratia-Rhizophora	172.9	4.6
Total mangrove	**3,769.7**	100

Fauna

There are about 87 species from different taxa with the decapod crabs recording the highest species (28) followed by 8 Lepidoptera (Butterflies and moths), 6 Gastropoda (snail mollusc), 2 Dendrobranchiata (penaeid prawns) and 1 Aves (bird) among others. Mikindani creek recorded the highest total species (66) and unique species (20) while Mkupe creek recoded the least total (44) and 4 unique species.

2.5: SOCIO-ECONOMIC STATUS

The population living adjacent to mangrove forest has largely depended on the mangrove forest resources for their livelihood and in meeting their basic needs. In this section a profile and a description of the population living adjacent to Mombasa mangrove forest is provided.

The population of Mombasa based on the 2009 census report is 939370 persons, of which 486924 are males and 452446 females. Benefits from mangrove forest resources accrue to population living adjacent to mangrove forest, but also spill over to the wider population, mainly from the ecological services (eco-services) that mangrove forests provide. Mangrove forests by their location at the ocean shore which stands at sea level bears the burden of population far and wide from proximal connectivity such as catchments and river systems. The trade chain of mangrove forest resources link and influence the activities of the forest with the wider population.

Household profile

Married couples with a few with single parents head the majority of households adjacent to mangrove forests. The average persons per household in are 4 persons per household in Kisauni and Changamwe, and 5 persons per household in Likoni. On gender balance the ratio of female to males in the survey area is 1:1. Majority of the households have attained primary education, a third have attained secondary education, only 2% of the population adjacent to Mombasa mangrove forest have attained a tertiary education while only a few households have no education at all. The primary occupation for household in Likoni is farming, Changamwe and Kisauni has fewer households engaging in farming with the majority of households opting to employment, business and casual work. Secondary occupations mainly consist of poultry farming and fishing. Business and employment are the most important source of income, with small scale fishing serving as supplement.

The land tenure of the area adjacent to the mangrove has no clear ownership, majority of the households have no Title Deeds or letter of allotment. The sizes of the land occupied by households ranges between 0.25ha to 6ha. The government, church, or trust land owns the land.

Education Levels

The literacy level of households adjacent to the Mombasa mangrove forest is relatively low. As depicted in Figure 2, although generally households had low literacy levels, Kisauni had relatively higher levels of education over other areas with more persons having attained secondary and tertiary education. However, majority of households have attained at least some primary education, with exceptionally few households with no education at all.

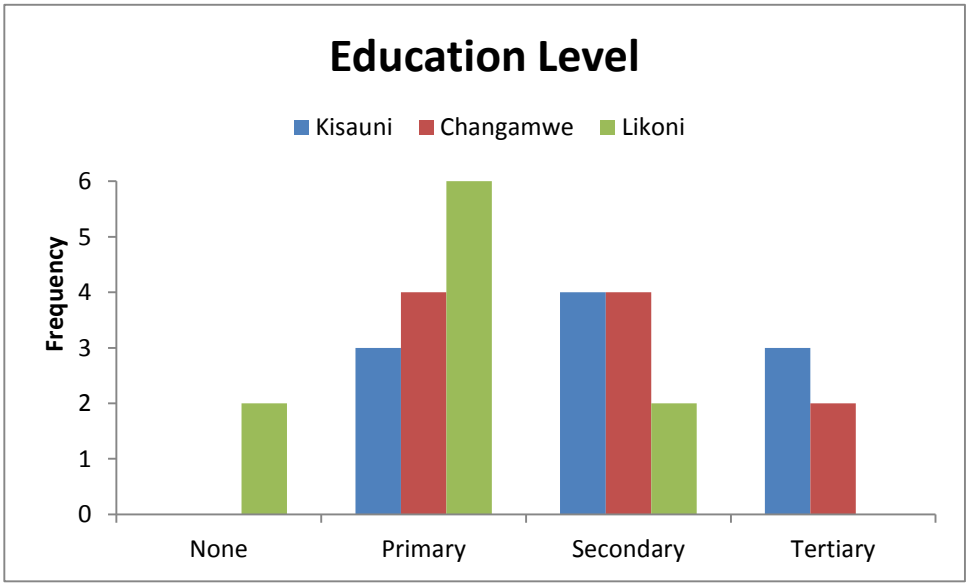

Figure 2: Household education levels for Kisauni, Changamwe and Likoni

Household Income

Households adjacent to mangrove forests have highly depended and presently depend on mangrove forest resources for their income and livelihoods. There is a general trend in the way households made their incomes in the three sub-counties as depicted in Figure 3.

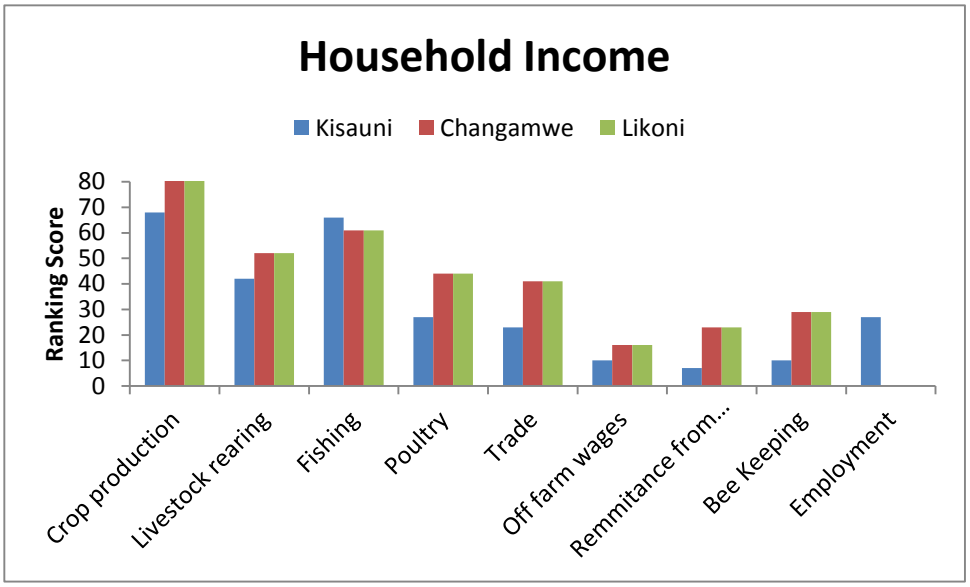

Figure 3: Income sources for households for Kisauni, Changamwe and Likoni

Ranking on household income indicate that the majority of households living adjacent to Mombasa mangrove forest depend on income from crop production, and closely followed by fishing activities (Table 3). Other income earning activities include livestock rearing, poultry, trade and bee-keeping. There is a higher level of engagement in trade in Kisauni households over other areas, this can be attributed to a higher literacy level with the majority households having attained secondary and tertiary level of education.

There is clear evidence that higher literacy and education level drive households to seek alternative income earning activities away from mangroves resources, these activities include employment and trade. The diversification of income earning activities eases pressure on mangroves resources and thus serves well to mangrove conservation efforts.

Table 3: Household income activity rankings

Site	**#1 income**	**#2 income**	**#3 income**	**#4 income**
Kisauni	Crop production	Fishing	Livestock rearing	*Employment*
Changamwe	Crop production	Fishing	Livestock rearing	*Poultry & trade*
Likoni	Crop production	Fishing	Livestock rearing	*Poultry & trade*

Mangrove Forest Utilization

The communities living adjacent to mangrove forests largely depend on the mangrove forest for provision of their basic needs, material and services. Some mangrove provisions of value to households include source of building materials, source of fuel wood, fishing areas, tourism sites, recreation areas and bee keeping areas. Housing and fuel wood are more pronounced activities for mangrove utilization mainly because of the nature of houses the community build, and the level of income in households leaves little room for alternative sources of energy.

Housing Characteristics

The most common type of housing in the survey area adjacent to mangrove forest is mud housing with iron sheets roofs and earth floors.

House roofs: Roofing in Kisauni and Changamwe is dominant iron sheet roofs, while grass thatched (makuti) roofs dominates in Likoni.

House walls: The majority of houses had mud walls, with a few exceptions that had a combination of stone, brick, cement and mud.

House floors: The majority of house floors are earth with a few exceptions of a combination of stone, brick, cement and mud.

The type of housing by the community living near the mangrove forest is highly dependent on the mangrove forest resources, which include wood for the roof thatch, terraces and mud walling. The extraction and excavation of mud both for walls and for floors contribute towards mangrove forest degradation through erosion and sedimentation, notwithstanding the removal of substrate and nutrients for mangrove development.

Community Mangrove Forest Value

The community values to mangrove forest reflect on meeting basic needs and as a supplement to livelihoods. The community highly valued mangrove forest for provision of building raw materials (Figure 4). Other important values include fishing areas and a source of fuel wood. The community has a general value of mangrove forests as tourist sites, habitat for wildlife with an emphasis on inhabiting bees for bee-keeping, hence enabling some income earning from selling honey to improve on their livelihoods. Use of mangrove forests as salt extraction sites, dumping sites, source of employment and timber provision are not as highly valued by communities as activities attributed with the mangrove forests.

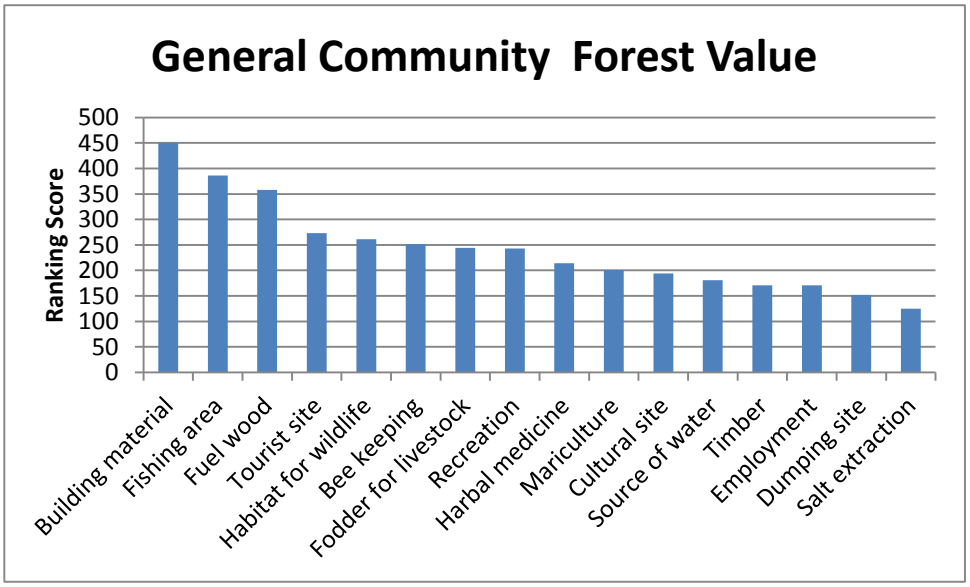

Figure 4: A general ranking on community value for mangrove forest resources

The Changamwe and Likoni communities have higher values for the mangrove forest provisions and services than Kisauni community (Figure 5) does. This may be attributed to Kisauni community depending less on the mangrove forest, and seeking alternative livelihood through employment and trade.

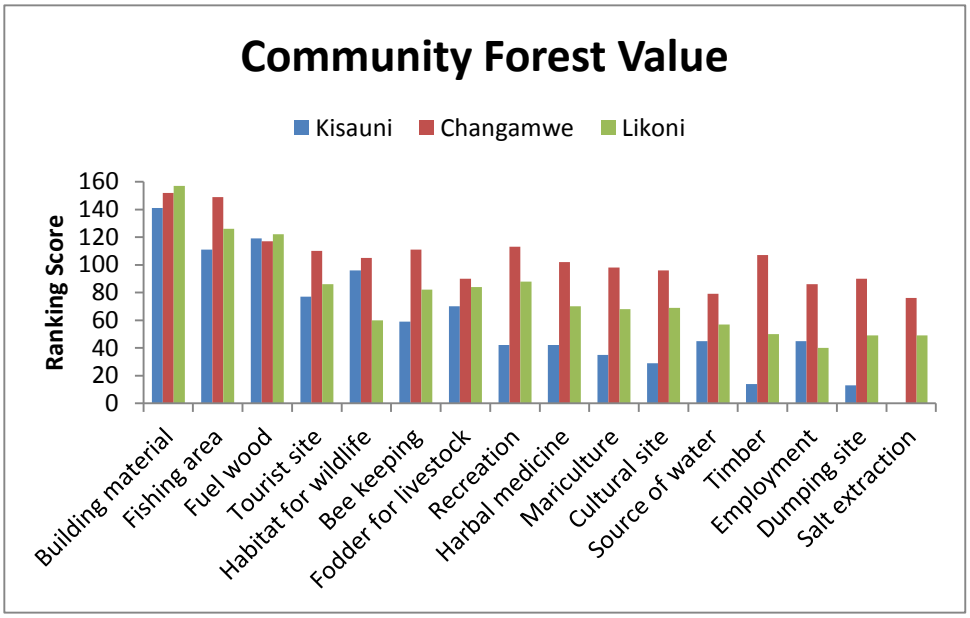

Figure 5: Ranking on communities' value for mangrove forest resources.

Alternative source of timber and poles

Timber and poles harvesting both for domestic and commercial use has played a role in degrading mangrove forests. The nature of housing that communities build along the mangrove forest increases the demand for poles and timber, unless an alternative source for poles and timber is identified, with the increase in population and thus an increase in demand for housing, mangrove forest will continue to degrade.

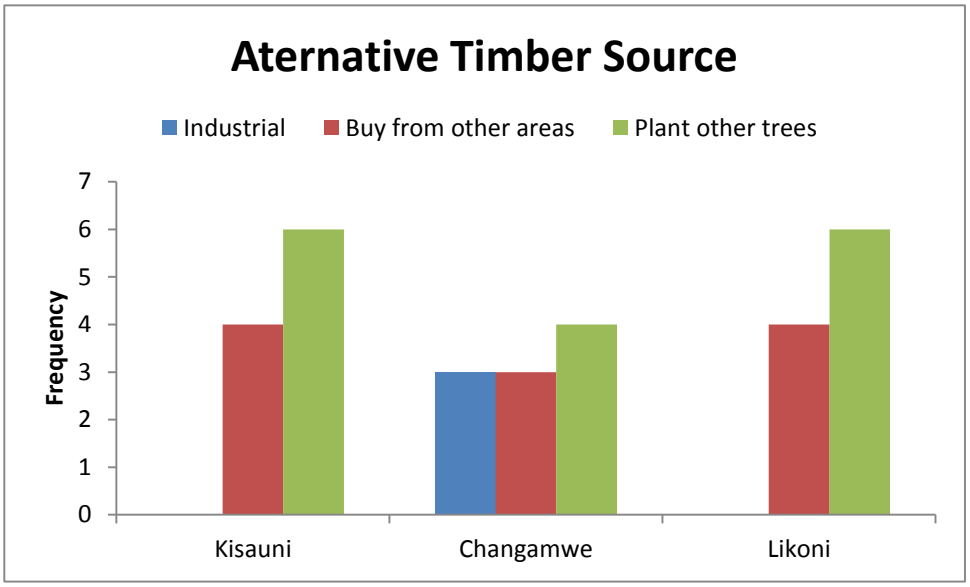

Figure 6: Alternative timber sources from mangrove utilization

As depicted in Figure 6, the community views a need to plant other trees as an alternative source of timber a supplement for firewood. Another suggested alternative for timber is buying timber from other areas and use of industrial material in an attempt to save mangrove forests.

Changes within Mangrove Forest

A general trend on changes on mangrove forest indicates a decrease in mangrove forest in terms of cover and area over time. However, as shown in Figure 7, a few households indicated the mangrove forest not having changed at all, this is expected with the varying and staggering times that different households have lived in the respective areas. The increase in mangrove coverage and area reported is mainly from the rehabilitation and re-planting exercise is carried out in the different areas within the Mombasa mangrove forest areas.

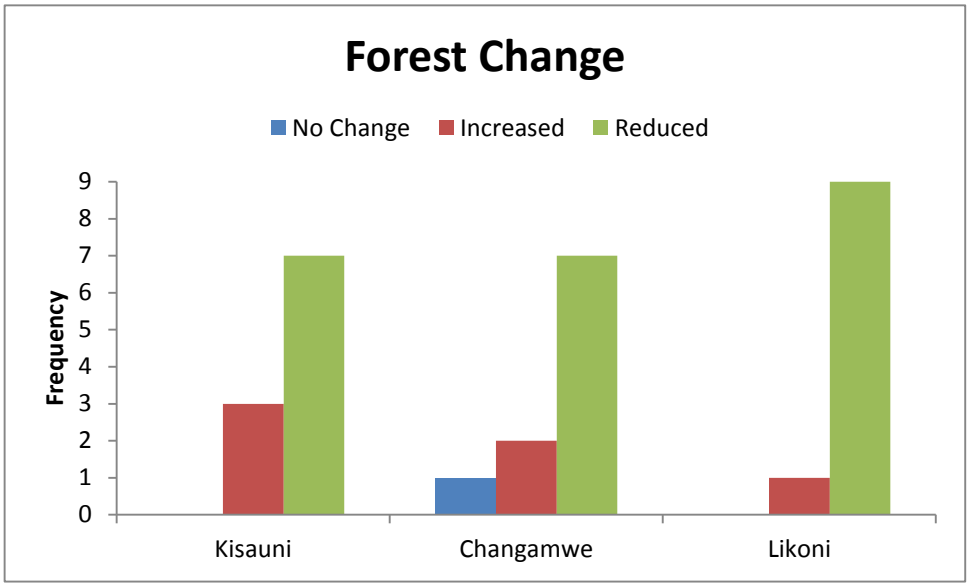

Figure 7: Suggested changes in mangrove forest

Species disappearance

Amongst the eight species of mangroves, the communities cited *Rhizophora mucronata* and *Ceriops tagal* species to have significantly reduced and disappeared in some areas. The disappearance of these species is attributed to the high demand of the species for timber, poles, firewood and their suitability for charcoal production.

Status of Mangroves

The general indication that mangroves within the Mombasa County are degraded (Figure 8), and that action need to be taken to curb the degradation.

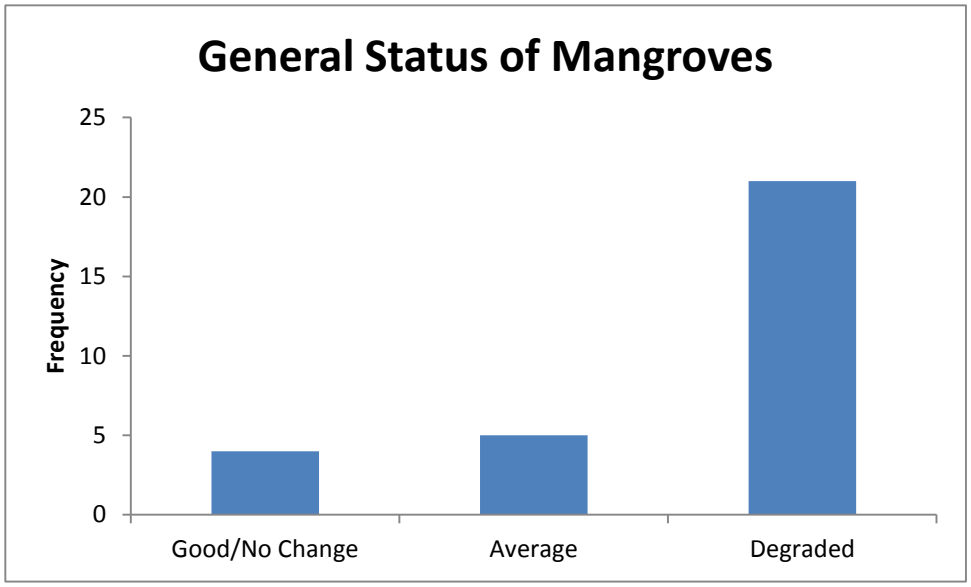

Figure 8: A general status of Mombasa peri-urban mangroves

The status of mangroves at site level (Figure 9) indicates that Changamwe has most degraded mangroves, followed by Kisauni, while Likoni has least degradation of mangroves.

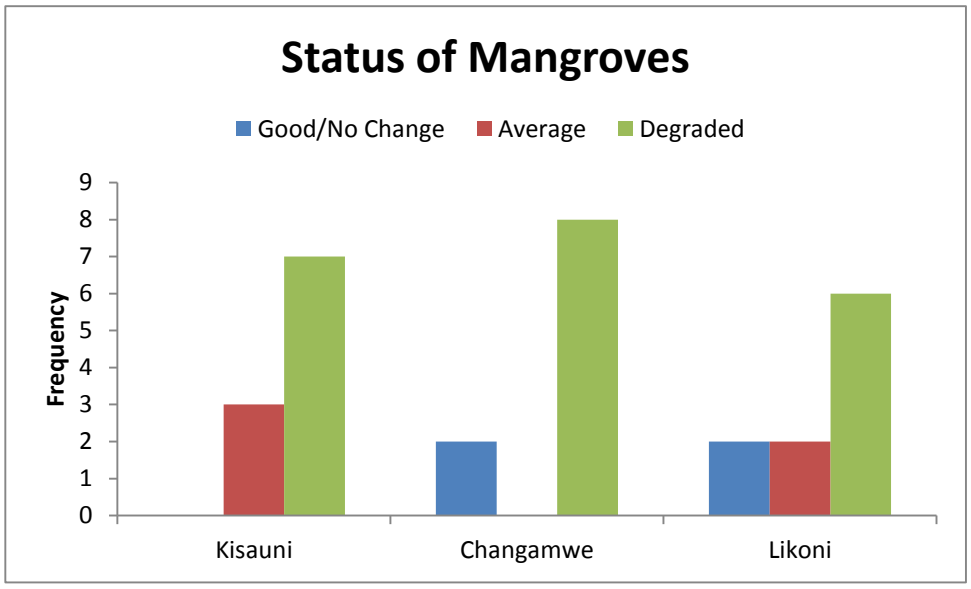

Figure 9: Status of Mombasa mangrove forests

Utilization of mangroves

There is a general indication that there is a high level of utilization of Mombasa mangroves forests, although there is a slight indication of a decrease in level of utilization especially in Likoni as indicated in Figures 10 and 11 below.

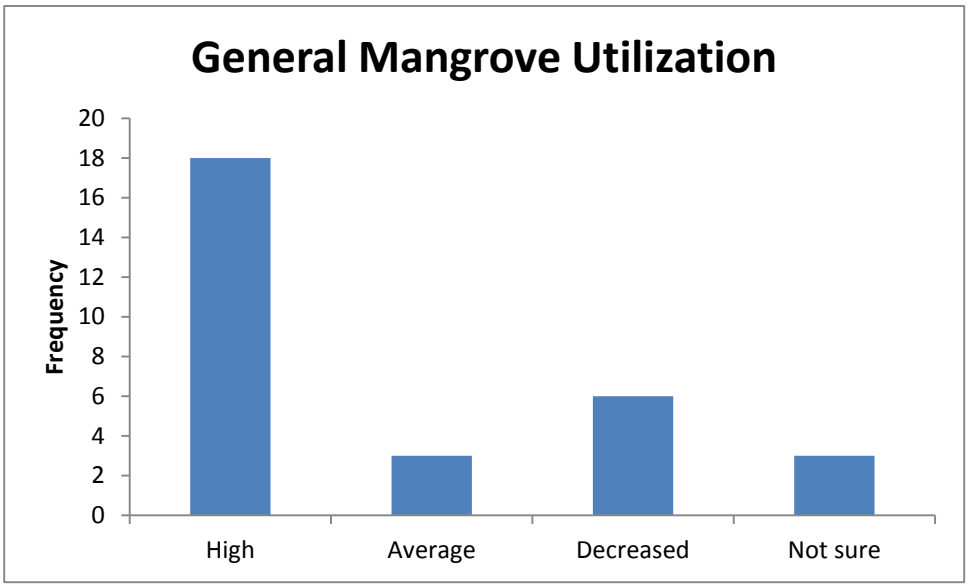

Figure 10: A general utilization levels for Mombasa mangroves forest resources

On site-to-site bases, although all areas surveyed indicated a high utilization of mangroves, a higher number of respondents in Kisauni felt that utilization of mangroves is high compared to other areas. Likoni is indicated to have a high utilization of mangroves but also some respondents felt that the level of utilization of mangroves was on the decrease compared to other areas. It is worth noting that despite the Changamwe community indicating a higher dependence on mangrove forest over other communities, fewer respondents indicated there to be high utilization of mangroves, and had a larger number of respondents not being sure of the level of utilization.

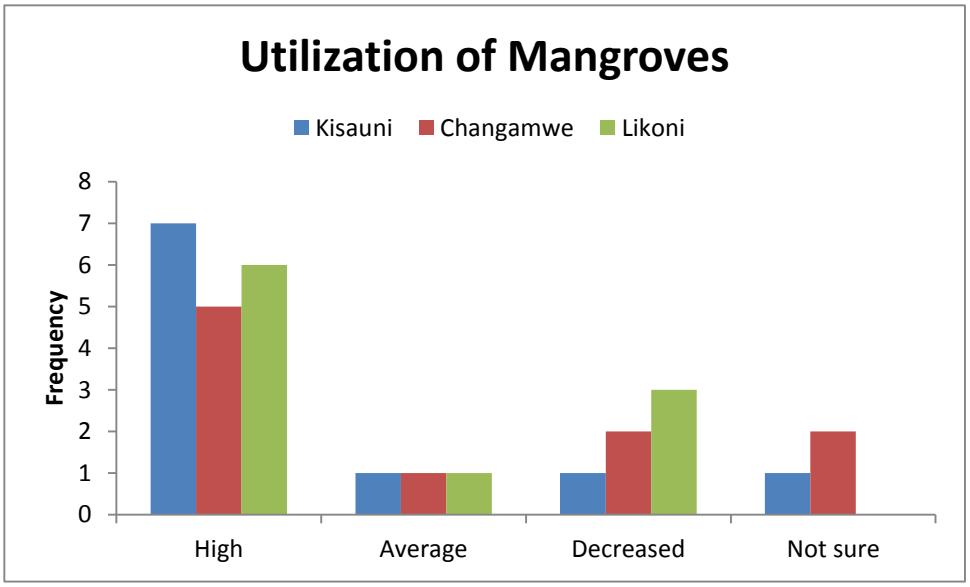

Figure 11: Status of mangrove forest utilization in the survey areas

Forest Management and Benefits

Benefits

The communities have a mixed feeling on the benefits attributed mangroves as indicated in Figures 12 and 13. The larger part of community indicate to have benefited from training on mangroves and conservation issues, the other significant benefit was the source of income, either directly from mangrove products and activities surrounding mangrove rehabilitation and conservation. Other benefit accruing from mangrove forest in a small way is product marketing. Worthwhile to note as indicated in Figure 12 is that quite a substantial portion of the community particularly from Changamwe indicates not to have perceived any benefits from mangrove forests at all (Figure 13).

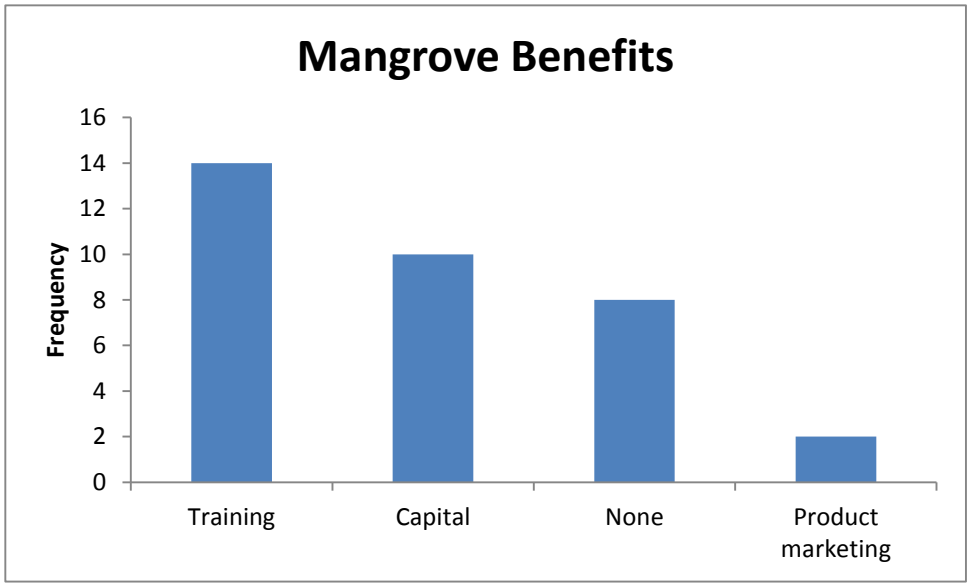

Figure 12: General Mombasa peri-urban mangrove benefits

The Kisauni and Likoni communities indicate to have benefited more from mangrove conservation through training, while Changamwe community indicate to benefit from capital accruing from mangrove forest activities in term of mangrove activity projects such as replanting activities and seedling nurseries that attract funding from donors.

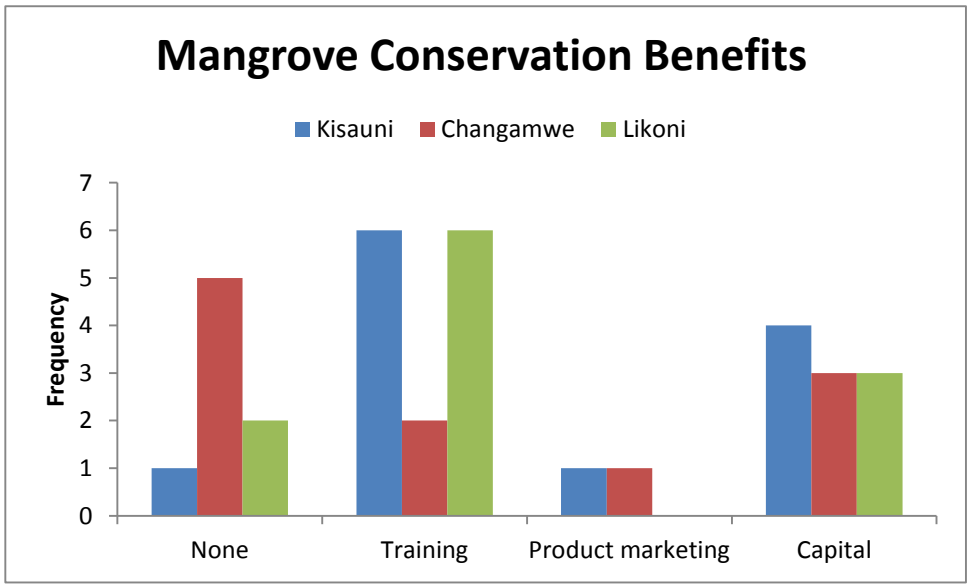

Figure 13: Mangrove forest benefits per survey areas

Mangrove Rehabilitation

There have been tremendous and encouraging efforts to rehabilitate mangrove forests in Mombasa. The larger community living adjacent to mangrove forest indicates to have participated in mangrove rehabilitation. In the rehabilitation efforts, two mangrove species have dominated in replanting, these are mainly *Rhizophora mucronata* and *Ceriops tagal.*

The results indicate that the success in the mangrove rehabilitation has a positive correlation with the number of training persons participating in the rehabilitation activity (Table 3). A high ratio between the trained persons and the number of people participating in the rehabilitation reflect a higher degree of rehabilitation success over where the ratio is low.

Table 4: Success in mangrove rehabilitation success based on stakeholders training

	Kisauni	Changamwe	Likoni
Participated	10	7	8
Trained Persons	8/10	4/7	4/8
Ration of participated/Trained	(0.8)	(0.57)	(0.5)
Rehabilitation Success	10/10	6/7	5/8
Rehabilitation Success Status	1	0.85	0.63

This is a clear indication on the importance of training for rehabilitation of mangroves to be successful. It is also an indication that trained persons are keen on participating in the rehabilitation of mangroves.

Mangrove rehabilitation training has been conducted by various institutions which included Kenya Marine and Fisheries Training Institute (KMFRI), Kenya Forest Service (KFS), NGOs such as Kwetu, and community initiatives. In all situations, the communities appreciated the training and associated the training to the success in the rehabilitation initiatives.

Cultural related Mangrove uses

Although there was not any major indication of an overriding cultural use of mangrove forest, the community cited some uses of mangrove forest resources such as:

- *Avicenna marina* as source of chalk
- *Rhizophora mucronata* as a source of coloring dye
- Herbal medicine
    - *Rhizophora mucronata* boiled bark – treatment for malaria
    - *Rhizophora mucronata* boiled roots – treatment for stomach ache
    - *Avecinia marina* – treatment for pregnancy

It is however noted that the Mombasa mangroves being in a peri-urban area, the community living adjacent to mangrove forest is multicultural, and thus has to larger extent limited knowledge on cultural and medicinal use of mangroves. There was not much emphasis on the use of mangrove forests as cultural sites either, this is probably because of the mix of culture and the shift of traditional way of life to urbanization due to the respondents proximity to urban areas.

Challenges in mangrove rehabilitation

Community challenges in mangrove rehabilitation are knowledge based, mainly a lack of technical skills in mangrove rehabilitation. The community is not knowledgeable on the various aspects that are required for effective mangrove rehabilitation. Most of these aspects are research based and can only be attained through training by the relevant institutions.

Another challenge that has affected mangrove rehabilitation has been sustainability, care and maintenance of rehabilitated areas. While there is a collective effort to rehabilitate mangrove forest, after the rehabilitation event often there is no after care mechanisms and processes for continuity purposes. Other challenges include the way the use of mangrove forests is administered, such that the community is busy rehabilitating the mangroves while outsiders and individuals are licensed by different institutions to exploit the very resource, this undermines the community's rehabilitation effort, and thus affecting the community's morale to rehabilitate mangrove forest for other groups benefit.

Mangrove Forest Products and Income Sources

The communities living near and adjacent to mangrove forests depended on mangrove forests for their basic needs and a supplement to their livelihoods. The communities benefit from forest products through direct use of mangrove products and services, and as a source of income. As shown in Figure 14 construction poles, fuel wood and fish were the most promising products that generated most income to the communities, and further benefited the communities in meeting their basic needs.

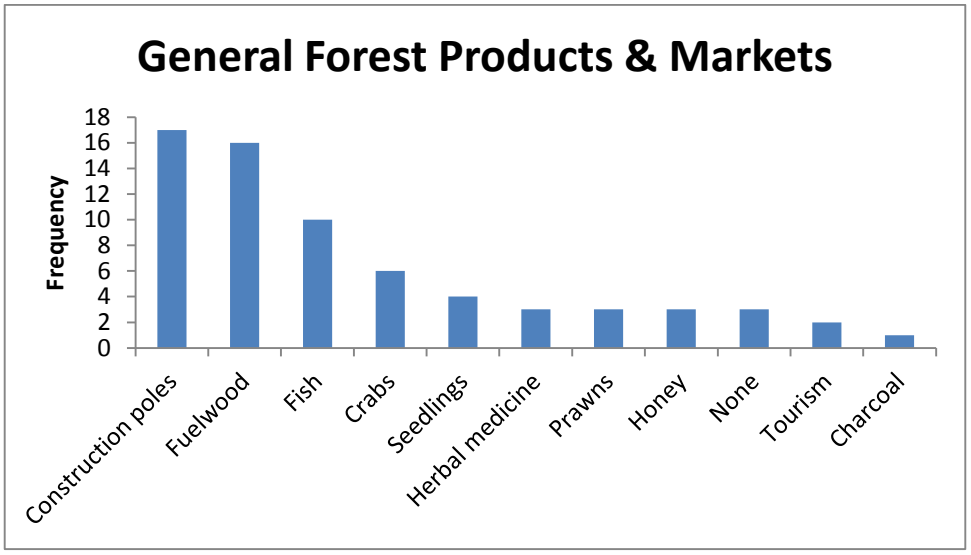

Figure 14: General Mombasa peri-urban mangrove forest products and markets

Site-specific products and market indicate a variation on forest products and markets in the different survey areas. As shown in Figure 15 the communities depend on mangrove forest for fuel wood. Kisauni and Likoni communities depend on the mangrove forest as fishing areas, and a source for timber.

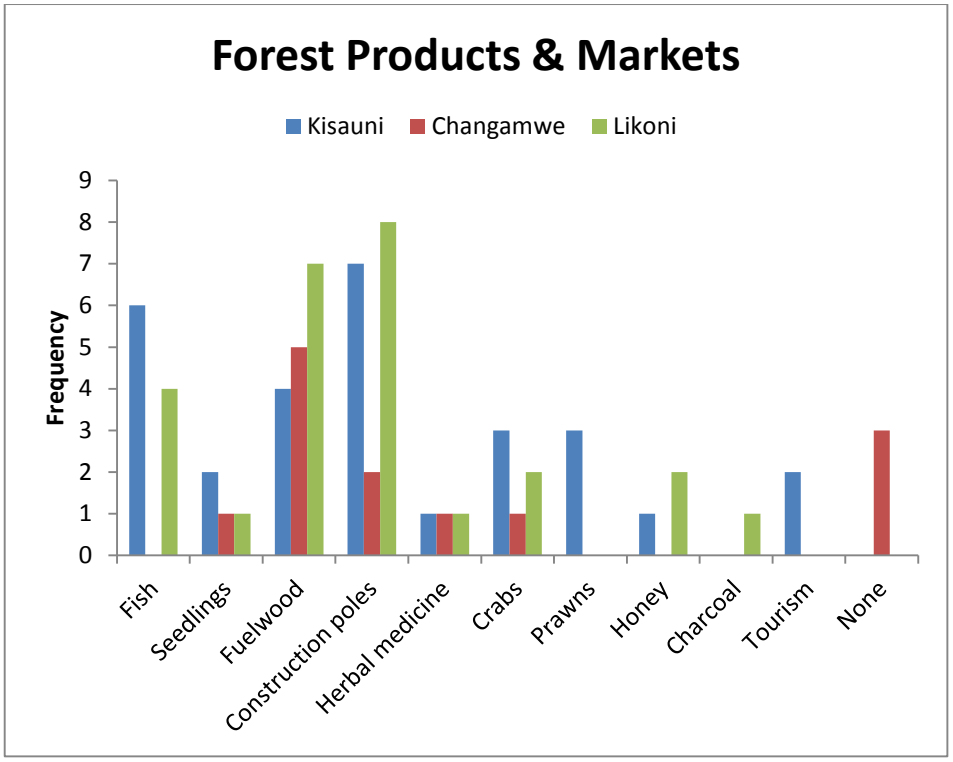

Figure 15: Mangrove forest resources products and markets per survey area

It is clear that part of the community in Changamwe did not attribute any benefits to mangrove forests, this is an indication for a need for increased awareness on the general benefits of mangrove forest resources. There is also need to explore on how the communities living along mangrove forest can benefit more by exploiting products such as herbal medicine, crabs, prawns, honey, charcoal and tourism while conserving the forest.

Local Community Rights and Privileges

The finding of this survey is that the majority of communities living along the mangrove forests were not clear with their mangrove forest user rights. Neither were they clear with who was in charge of mangrove management. Individuals had their own channels in the way they utilized the forest and obtained authority to exploit mangrove forest resources. While a few were aware of the need for permits to conduct some activities within the mangrove forests, the majority of the community members were not aware of who they needed to contact for the exploitation of the mangrove forests. Some of the avenues for authorization on exploitation of mangrove forests included, village heads (Mzee wa mtaa), KFS, Chiefs,

Community Forest Association (CFA) while others did not have to contact anyone to exploit the mangrove forest resources.

The respondents who were aware of the need for permits to exploit mangrove forest resources expressed their dissatisfaction and cumbersome nature of obtaining the permits from KFS as a key contributor to illegal exploitation of mangrove forest resources. Through CFAs the communities will get enlightened in their rights and privileges in the use and management of the mangrove forest resources.

Threats Facing the Mangrove Forest

It was unanimous with the communities that mangrove forests in Mombasa are under threat. The major threat of mangrove forests is labeled on the uncontrolled cutting of mangroves leading to environmental degradation (Figure 16). The ongoing degradation on mangrove forest through uncontrolled cutting of mangrove can be attributed to dependence on the community living along the mangrove forest to meet their basic needs such as building materials (timber and poles), and fuel wood. In Changamwe to some extent the uncontrolled cutting is contributed by cutting mangrove forests for commercial timber, timber trade was marginal in Kisauni and Likoni. Charcoal production to some extent contributed to mangrove forest degradation in Likoni.

MANGROVE THREATS

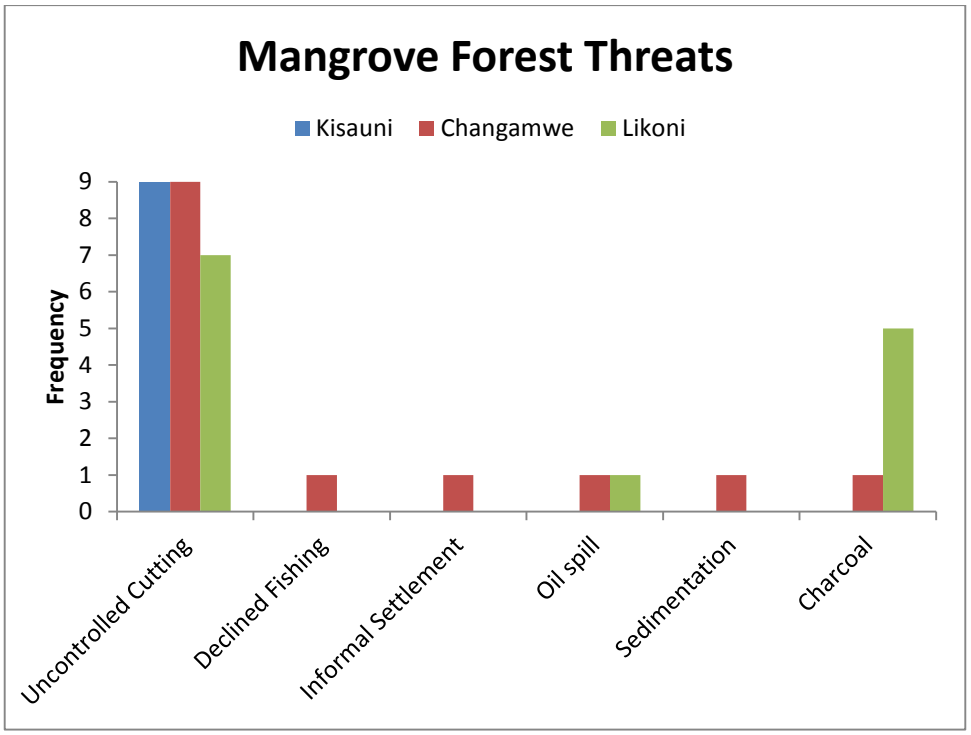

Figure 16: The main mangrove threats of Mombasa peri-urban mangroves

Through observation during the data collection period it was evidenced that sedimentation although not being perceived by the communities as a threat, sedimentation has significantly contributed to mangrove forest degradation. It is evidenced that sedimentation affected the regeneration of mangrove seedlings, with little and poor generation of seedlings in sediment areas. The sedimentation was in the larger part attributed to poor land-use practices, cutting of terrestrial trees on land sloping to the mangrove forests and over grazing by livestock on coastal slopes which aggravated erosion.

The key threats to mangrove forests are:

a) ***Illegal harvesting of mangroves:*** the harvesting is mainly for commercial purposes such as trade in building poles, commercial charcoal and fuel wood.

b) ***Uncontrolled domestic cutting of mangroves***: mainly for domestic use purposes. The cutting is motivated by the need for domestic construction material by the community living adjacent to mangroves. Distilling of Chang'aa (local beer) especially in Tudor creek in has highly contributed to degradation of mangrove forests through illegal cutting of mangrove trees for fuel wood.

c) ***Sedimentation***: Sedimentation in the mangrove forest can be attributed to poor land use practices in the adjacent land. The poor land practices include cultivating on slopes edging mangrove forests, The sedimentation situation was worsened during the 1997/98 El Nino rains that hit the country causing massive death of mangroves in many areas along the coast. Sedimentation is a threat to mangrove forest.

d) Encroachment: encroachment of mangroves through both commercial development and informal urban settlement is rampant in Mombasa County. The encroachment has highly contributed to mangrove degradation through clear felling mangroves to pave way for building and settlement, pollution by disposing both solid and effluent waste into mangrove areas.

e) ***Oil spill***: the spill has been reported at Kilindini mainly due to its proximity to the port. For instance, between 1983 and 1993 Mombasa port and surrounding waters experienced 391 680 tonnes of oil spills that affected mangroves of Port Ritz and Makupa creeks. On a smaller scale, some illegal landing of used oils from offshore boats and ships by small-scale traders has been cited to cause oil spills that affect young mangroves around the undesignated landing points. This has been reported in Likoni and Changamwe.

f) ***Climate Change:*** an emerging threat to mangroves in Mombasa and globally in general is climate change. The threat is attributed to the projected rise in sea level and temperatures. Climate change impacts are also associated with increased flooding/sedimentation and aridity. Since coastal area where mangroves occur is low-lying land, a small increase in sea level will mean that mangrove will be submerged unless they can migrate to new areas mainland. Looking at the Kenyan coast, most areas where mangroves could migrate to have already been settled by human or have infrastructure. Evidence of death of mangroves due to climate change impacts has

been observed in several areas along the coast such as Gazi bay, Mwache creek. Impacts on mangrove forest may adversely affect the community livelihood.

g) ***Poverty:*** High level of poverty exists among communities adjacent to Mangrove forest have depended on Mangrove forest resource for their livelihood. Poverty has widely been attributed to degradation of forests in the developing countries and globally at large. Inequality has contributed to unsustainable use and management of forest because the poor, who rely on natural resources more than the rich do, deplete natural resources faster as they have no real prospects of gaining access to other type of resources.

2.6 STAKEHOLDERS ANALYSIS

There are various stakeholders with interests in this forest. However, their contribution in activities related to forest conservation and management has not had noticeable impact. The simple reason is that in the past there has not been meaningful effort to involve them in the establishment, management and conservation of forests not to mention benefit/cost sharing.

Roles and Responsibilities of Stakeholders

The stakeholders as identified by communities and TWG during the PFMP development meetings and their roles in the use and management of mangrove forest resources are summarized in Table 4.

Table 5: List of stakeholders

Stakeholder	Status	Roles	Responsibilities
Kenya Forest Service (KFS)	State corporation	Management and protection of state forest and forest extension	Establishment, protection and sustainable management of forest, maintenance of roads within the forest, promotion of farm forestry, promote forest ecotourism
County Government of Mombasa	County Government	Collection of revenue and provision of public services	Roads maintenance, tree planting, cess collection, issuance of trade licenses, fund forest based activities e.g. seedling raising
National Environment management Authority (NEMA)	State Corporation	Enforcement of environmental regulation	Approval, licensing and Coordination of EIA/EA Awareness creation on environmental matters
Kenya Wildlife Service (KWS)	State corporation	Wildlife conservation and management	Custodian to Kenyan wildlife
National Museums of Kenya (NMK)	State Corporation	Collect, preserve, study document and present Kenya's past and present cultural and natural heritage	Protection and preservation of national heritage sites
Kenya Maritime Authority (KMA)	State Corporation	To regulate, coordinate and oversee maritime affairs	Develop, coordinate and manage a national oil spill contingency plan for coastal waters Ensure, in collaboration with such other public

Stakeholder	Status	Roles	Responsibilities
			agencies and institutions, the prevention of marine source pollution, protection of the marine environment and response to marine environment incidents
Mombasa Kilindini Community Forest Association (MOKICFA)	Community based Organization (CBO)	Promotion of IGA's, Collaboration In management of Forest With KFS	Assisting in establishment, protection & sustainable management of mangrove forest, Farm Forestry, provision of labour, Management of IGA's and collection of revenue from FUG's
WWF, KFWG, WCK, CLARION	Non-Govenmental Organization (NGO)	Capacity building and advocacy Promotion of sustainable forest management of natural resources	Promote environmental conservation, livelihood improvement -Funding, awareness creation -Education on conservation issues
Research Institutions and Universities	State Corporation, Institutions of higher learning	Forest research and education	Undertake research on emerging forestry challenges, dissemination of research findings, seed collection and storage, effective PFM arrangements

Stakeholder	Status	Roles	Responsibilities
State department of Interior coordination	Government Department	To provide strategic leadership ,policy direction ,a secure environment and set the agenda for achieving social economic and political development direction Law enforcement and public administration	Provide security and community mobilization and administration, conflict resolution
MOALFD	Government Department	Responsible for food security through improved farming methods	Promotion of better farming methods and farm forestry Soil and water conservation on farmlands
Ministry of Energy	Government Department	Technical Advice on tapping and packaging various types of energy	Provision of Knowledge on energy production and saving
KPA, KENGEN, KAA, Kenya Ferry, Kenya Railways, CDA, Kenya Power, KENHA	State Corporation	Social Corporate Responsibility	Support to Conservation , tree planting, Capacity building
La-Farge Ecosystems, Shell BP, Grain Bulk, NatureCom Group	Private Sector	Partnerships, Advisory Social Corporate Responsibility	Support to afforestation

CHAPTER 3: PLANNING CONSIDERATIONS

3.1 POLICY AND LEGAL FRAMEWORK

The preparation, planning and implementation process of Mombasa Mangrove Forest Management Plan recognizes the existence of various policies and legislation, whose objectives have a direct impact to sustainable conservation, management and utilization of the Forest. These include Forest Policy and Act, 2005, Water Act, 2002, Wildlife Management and Conservation Act 2013, EMCA, 1999. These policies and laws are briefly analyzed below. Some other national, regional and global policies and agreements are also included.

The Constitution, 2010

a) The constitution, 2010 Chapter 5, Part 2 section42 and 69 (a, b & d) requires the state to:-

b) ensure sustainable exploitation , utilization, conservation of the environment and natural resources ,and ensure the equitable sharing of the accruing benefits.

c) Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya.

d) Encourage public participation in the management, protecction and conservation of the environment.

e) Equitable distribution of natural resources.

Fourth Schedule

(Article 185 (2), 186 (1) and 187 (2))

Implementation of specific national government policies on natural resources and environmental conservation, including—

(a) Soil and water conservation; and

(b) Forestry

Article42.

Every person has the right to a clean and healthy environment, which includes the right—

a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
b) to have obligations relating to the environment fulfilled under Article 70

The Forest Policy and Legislation

Kenya's first forest policy was formulated in 1957 through White Paper No. 85 then subsequently restated in 1968. A draft Forest policy 2014 is in place and awaiting parliamentary approval. It emphasizes the involvement of forest adjacent communities and other stakeholders in forest management and conservation. The draft policy recognizes the inter dependence of local communities livelihoods on forests for spiritual, cultural and material benefits. It provides for measures and strategies in enhancing the community in environmental conservation.

The Forests Act Cap 385 was applicable to gazetted forest areas (Forest Reserves) only, and so did not directly apply to forests in trust and private lands. In drafting this plan cognizance of the provisions of Forests Policy (Sessional Paper No.1 of 2007) and the Forests Act No. 7 of 2005 were considered. The Forests policy and the Forests Act 2005 provide for community participation. The goal of the Policy is to enhance the contribution of the forestry sector in the provision of economic, social and environmental goods and services. The Forests Act too addresses the needs of the local communities and provides for partnership in the management of state forests.

The Forests Act, 2005 requires that all forests be managed through approved management plans and participation of stakeholders. In Part IV section 46 (2), Communities living adjacent to Forest Reserve have a provision to apply to the Director for permission to

participate in the conservation and management of a state or local authority forest in accordance to the provision of the Forests Act, 2005. The functions of a forest association approved by the Director are stipulated in section 47 (1a-h). To undertake these functions, the CFA needs to negotiate and enter into a Forest Management Agreement with the Director KFS (section 47 (2).

Water Policy (Sessional Paper No. 1 of 1999) and Water Act 2002

The main objective of the water policy is the supply and the distribution of water resources throughout Kenya. It recognizes that increased human activities in the catchment area have reduced forest cover and hence is a threat to water resources.

Water Act lays out a mechanism for development of a national water resources management strategy and subsequently catchment management strategy, gives effect to the water rules which together with catchment management strategy (CMS) act as tools for water resource management and conflict resolution, for the protection, storage, use, development, conservation and control of water resources. It is through the CMS that important water catchments are determined as a link to the forest sector. The Act devolves the authority over the conservation of such catchment to local stakeholders who manage the catchment in collaboration with WRMA. The strength of this Act is in its liaison with other bodies for better regulation and management of water through the formulation of CMS for the management, use, development, conservation, protection and control of water resources.

The Wildlife Policy and Legislation

The Wildlife Conservation and management act 2013 became operational on 10th January 2014. The new law has as one of its guiding principles as devolution of conservation and management of wildlife to land owners and managers in areas where wildlife occurs, through in particular the recognition of wildlife conservation as a form of land-use, better access to benefits from wildlife conservation and adherence to the principles of sustainable utilization. Thus, wildlife conservation and management is recognized as a form of land-use that has equal recognition with other land uses types such as agriculture.

Section 18 -20 of the Act clearly states that Governance and decision-making on wildlife matters will be largely devolved to a County level through formation of County Wildlife Conservation and Compensation Committees (CWCCC). The CWCCC is responsible for: registering wildlife user rights; overseeing development and implementation of management plans on community and private land, and ensuring benefits from wildlife are accordingly distributed. The CWCCC brings together stakeholders for effective land use planning; monitoring and implementation of management plans for National Parks in their area together with KWS; developing and implementing mechanisms for human-wildlife conflict mitigation; reviewing and recommending on claims for compensation from wildlife damage or loss. Compensation for human death, injury or damage to property has significantly increased under the new law (Section 25). The Act requires the equitable sharing of benefits and having direct incentives derived from managing wildlife, hence helping in improving the living standards of those who live in wildlife areas yet are very poor.

Environmental Management and Coordination Act of 1999

The Environmental Management and Coordination Act (EMCA) No. 8 of 1999, embraces all environmental management issues in the country. The Act addresses the environmental concerns and safeguards against environmental degradation within and outside protected areas.

The Act provides the legal framework for the implementation of National Environment Action Plan (NEAP), which gives due regard to ensuring that people live in a clean and healthy environment. It also emphasizes maximum participation by stakeholders in the development and implementation of policies, plans and processes for the management of the environment.

Grass Fires Act, Cap 327

The grass fire act Cap 327 provides for protection of the vegetation by regulating burning of bushes, shrubs, grass, crops and stubble through issuance of permits to carry out planned

burning processes within protected areas, Trust land and in private lands. Controlled burning is used as a natural resource conservation measure, which helps in controlling pests, invasive plant species and improving pasture. It also requires a two weeks notification be given to the neighbors before burning the vegetation in his/her farm. This is not mandatory to national reserves.

Chief's Act (Cap 128)

The Chiefs' Authority Act was amended in 2003 to read Chiefs' Act. The application of the Chiefs' Act predominantly relate to law and order but as far as conservation and management of forests is concerned; interior coordination will be responsible in mobilization of communities for awareness creation through barazas, field days, tree planting and in conflict resolution. This Act has proved to be useful when dealing with forestry, prevention of fires, illegal logging and transportation of illegal forest produce and boundary tree planting disputes, problems outside gazetted forests and use of resources on public land for the local community development. This should be in conformity with the constitution.

Agriculture Act – Cap 318 (Agriculture farm forestry Rules 2009)

The objectives of the Agriculture Act are, maintaining a compulsory farm tree cover of at least 10% of any agriculture land holding, conserving water , soil and biodiversity, protecting riverbanks, shorelines, riparian and wet land areas, sustainable production of wood, charcoal and non-wood products, providing fruit and fodder, carbon sequestration concentration and other environmental services. Any person who owns or occupies agricultural land shall establish and maintain minimum of 10% of the land under farm forestry and such may include tree on soil conservation structures, range land and crop land in any suitable configuration provided the species of trees or varieties planted shall not have adverse effect on water sources. No agricultural land owner or occupier shall grow or maintain any *Eucalyptus spp* in wet lands and riparian areas.

Under this Act, the Director of Agriculture can issue land preservation orders to land owners that may prohibit the clearing of vegetation or the grazing of livestock in vulnerable

ecosystems, require the afforestation of land to reclaim areas threatened with degradation or demand the use of farming techniques compatible with conservation requirements. The government has the responsibility of creating the environment that will facilitate sustainable conservation efforts, raising farmers' income through improved marketing arrangements, better roads, increased farm-products prices, and reduced taxes that would stimulate farmers to improve the land use and management of resources.

National Energy Policy and Energy Act 2006

Biomass is the largest form of primary energy consumed, accounting for 68 % of the total national primary energy supply. The principal drivers of biomass energy demand are population growth, lack of access to biomass energy substitutes and the growing incidence of poverty among Kenyans. The biomass energy supply and demand imbalance is exerting considerable pressure on the remaining forest and vegetation stocks, thereby accelerating the processes of land degradation. In addition, the production of biomass energy poses a threat to competing land use systems such as agriculture, forestry and human settlements.

The Energy Act 2006 provides the framework on energy in Kenya and hopes to ensure that the relevant ministries, NGOs and other organizations address environmental problems associated with the supply and use of energy (charcoal and firewood). The broad objective is to ensure adequate, quality, cost effective and affordable supply of energy to meet the demands while protecting and conserving the environment.

Provide sustainable quality energy services for development.

a) Utilize energy as a tool to accelerate economic empowerment to urban and rural development.

b) Improve access to affordable energy services.

c) Provide an enabling environment for the provision of energy services.

d) Enhance security of energy supply.

e) Promote development of indigenous energy resources.

f) Promote energy efficiency and conservation as well as prudent environmental, health and safety practices.

National Land Policy

National Land Policy under the Ministry of Lands deals with among other problems, wanton destruction of forests, catchment areas and areas of unique biodiversity and severe competition between wildlife's needs and those of human settlements. The policy seeks to ensure that the management and utilization of land-based natural resources by public entities take into account the need to share benefits with local communities and that such communities are fully involved in the management and development of the resources including forests. More specifically, it advocates for forest conservation in order to protect water catchment areas from further degradation. These provisions support the Forests Act 2005 and the Draft Forest Policy.

The Fisheries Act, Cap 378.

The Act provides for the development, management, exploitation, utilization and conservation of fisheries Resources. The National oceans and Fisheries policy, 2008 is the fisheries policy document. The settler community's interest in recreational and ornamental fisheries is what informed the fisheries legislations that were enacted by the colonial governments. The colonial government enacted the Fish Protection Act (Cap 379 of the laws of Kenya). In 1905, Trout was introduced in the rivers around Mt. Kenya. In 1948, Trout Ordinance (CAP 380) was enacted to regulate the exploitation of trout. The Fisheries Protection Act (CAP 379) was amended to create the Departments mandate to include commercial exploitation of fresh water, marine fisheries and aquaculture development. In 1989 Fisheries Act (Cap 378) was enacted to provide legal framework for the expanded mandate of the Department and is principal statute that regulate and govern fisheries to date. The Oceans and Fisheries policy, 2008 was developed and operationalized with some of the objectives being:

a) To promote conservation and management of oceans and fisheries resources

b) To enhance food supply and food security

c) To develop aquaculture

The Government encourages investment in small, medium and large-scale commercial aquaculture for domestic and export markets. The government will promote private sector investment in the development of recreational and ornamental fisheries through provision of incentives and infrastructure.

The Kenya Maritime Authority Act (2006)

The act established the Kenya Maritime Authority, which advises the government on legislative and other measures for implementing international conventions, protocols and agreements. The act also provides for collaboration with such other public agencies and institutions, to ensure the prevention of marine source pollution, protection of the marine environment and respond to marine environment incidents.

The Maritime Zones Act No. 6 of 1989

This act is one of the statutes, which has been enacted by Kenya for application to territorial waters and the continental self. The Act is meant to provide for the delimitation of the exclusive economic zone of Kenya. It is also meant to provide for the exploration conservation and management of the resources of the maritime zones. Section 5 of the Act provides for Kenya's sovereignty with respect to the exploration, conservation and management of the resources in the zone. Section 9(1) (b) specifically mandates the minister to make regulations for prescribing measures for the protection and preservation of the marine environment.

The Merchant Shipping Act of 2009

The Merchant Shipping Act 2009 makes provision for, among others, the registration and licensing of Kenyan ships. It further has a crucial role in regulating shipping activities in the

inshore areas and extending to the EEZ, provides for maritime safety, security, pollution control and environmental conservation.

3.2 LINKS TO DEVELOPMENT BLUE PRINTS

Development of a participatory forest management plan marks a beginning of a road map for deliberate co-management approach and organized forest management. However, the plan cannot be effective and successful if implemented in isolation, and thus the need to link the plan to other development blue prints.

Vision 2030

This is the country's development blue print covering the period 2008-2030. It aims at making Kenya a newly industrializing middle-income country providing high quality life for all its citizens by the year 2030. The vision comes after a successful implementation of the Economic Recovery Strategy for Wealth and Employment Creation (ERS). The vision is based on three "pillars" namely; the Economic pillar, the Social pillar and the Political pillar. The economic pillar aims at providing prosperity of all Kenyans through an economic development programme aimed at achieving an average Gross Domestic Product (GDP) growth rate of 10 % per annum for the next 25 years.The Social pillar seeks to build "a just and cohesive society with social equity in a clean and secure environment." The Political pillar aims at realising a democratic political system founded on issue-based politics that respects the rule of law, and protects the rights and freedoms of every individual in the Kenyan society.

Payment of Environmental Services (PES)

Payment of Environmental Services (PES) is a mechanism for creating incentives to manage natural resources, address livelihood issues for the rural poor and provide sustainable financing for protected areas. The basic idea is that beneficiaries to the services should compensate those who provide environmental services by conserving natural ecosystem.

Natural ecosystem provide a wide range of environmental services from which people benefit and upon which all life depends e.g. provision of food, fuel, building materials and fresh water, climate regulation, flood control, nutrient & waste management, maintenance of biodiversity and cultural services.

It is a new market-based approach to conservation that aims to change incentives for land use in order to maintain or restore natural ecosystems so that they continue to provide the desired environmental services. The basic principle is that those who provide environmental services should be rewarded for doing so. This is achieved through a variety of arrangements that transfer compensation from those who conserve, restore and manage the natural ecosystem that provides it. Compensation may be monetary or in a kind and may involve private sector or government financing and can be made at local, national & global levels. Compensation to land manager must make them meet benefits derived from maintaining environmental services to be greater than those derived from alternative land users.

PES can be combined with other sources of financing for protection of natural resources. It's expected to have a positive impact on the rural poor, both as beneficiaries of PES scheme and through conservation of the natural ecosystem upon which they are reliant for their livelihood, health and security. In providing a means of dialogue and agreements, it may help poverty-alleviation programmes to run more efficiently through establishment of well-defined relations between natural finance and social capital. It further has the potential role in solving social conflicts such as those between extractive industries and local communities by stimulating the development of new skills and strengthening the co-operative and hierarchical arrangements in which the poor depend.

PES provides an opportunity for the stakeholders managing Mombasa mangrove Forests to gain incentives for conserving the forest and delivering environmental services such as watershed services, carbon sequestration, and landscape beauty and biodiversity conservation

Reducing Emissions from Deforestation and Degradation (REDD)

Reducing Emissions from Deforestation and Degradation (REDD) is a proposed mechanism under the UNFCCC to slow the loss of forests in order to mitigate against climate change, address rural poverty and preserve biodiversity. The concept embraces all the degraded areas

in Mangrove forests and promotes conservation of Mangrove species. Countries that are willing and able to reduce emissions from deforestation should be financially compensated.

Links to Multilateral Environmental Agreements (MEAs)

The Government of Kenya is a signatory to international/regional treaties and conventions on conservation of threatened, endangered, endemic species and fragile ecosystems. The management plan will recognize the roles and responsibilities of the implementing stakeholders in the coordination of the relevant multilateral environmental agreements (MEAs); Convention on Biological Diversity (CBD), the Global Forest Principles (GFP), Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Ramsar Convention, Bonne Convention UNFCC, East African Community Secretariat (Cross border Natural resource management).

The Convention on International Trade in Endangered Species of Flora and Fauna (CITES)

The regulations of CITES are statutory and ensure that trade in specimens of wild animals and plants do not threaten their survival. There are several CITES agencies in Kenya. Trade in CITES listed species require clearance from the authorized offices. Plan strategies that impact on the exploitation and / or trade of specimens of CITES species will take cognizance of CITES requirements as directed by the relevant authorities.

Convention on Biological Diversity (CBD)

The Convention on Biological Diversity stipulates that it is the responsibility of states to conserve their biological diversity and to use their biological resources in a sustainable manner. It further notes that it is vital to anticipate, prevent and attack the causes of

significant reduction or loss of biological diversity at source, and that *in situ* conservation of ecosystems and natural habitats is a fundamental requirement for the conservation of biological diversity.

Kenya has undertaken activities that are consistent with the goals of the Convention, and has for example taken measures to develop a national strategy for the conservation of biological diversity and has established a system of protecting the endangered species both in the protected and dispersal areas. The interest of CBD is enshrined in the existing laws and policies.

United Nations Framework Convention for Climate Change (UNFCCC)-Kyoto Protocol

This international agreement aims to reduce both carbon dioxide emissions and the presence of greenhouse gases. Countries that ratify the Kyoto Protocol are assigned maximum carbon emission levels and can participate in carbon credit trading. Emitting more than the assigned limit will cause the violating country to be penalized by lowering its emission limitation in the subsequent period. The Kyoto Protocol separates countries into two groups. Annex I includes developed nations, while Non-Annex I refers to developing countries. Emission limitations are only placed on Annex I countries. Non-Annex I nations participate by investing in projects that lower emissions in their own countries. For these projects, they earn carbon credits. These credits can be traded or sold to Annex I countries, which allow them a higher level of maximum carbon emissions for that period.

Global Forest Principles (GFP)

The Global Forest Principles are a non-legally binding authoritative statement of principles for a global consensus on management, conservation and sustainable development of all

types of forests in the world. The Forest Principles arose from the realization of the importance of forest resources and concern over the threats to these resources worldwide. The principles apply to all types of forests, natural and re-established, in all geographic regions and climatic zones.

Forest Principles

Encourage forestry development by promoting participation of local communities, indigenous people, industries, labour organizations, NGOs, forest dwellers and women in development, implementation and planning of national forest policies;

a) Advocate that national policies and strategies should provide a framework for increased efforts in management, conservation and sustainable development of forests and forest lands;

b) Stress that decisions on management, conservation and sustainable development should be based on a comprehensive assessment of economic and non-economic values;

c) Develop policies and legislation that will ensure that unique vegetation types are conserved for cultural, spiritual, historical, medicinal and religious needs, as well as for biodiversity value and environmental services

d) Incorporate the process of environmental impact assessment into national policies, especially where actions are likely to have significant adverse impacts on critical forest resources.

Mombasa Mangrove forest is in line with those principles as evidenced by involvement of the local community in developing this participatory plan, which on implementation will ensure sustainability of the forest.

Millennium Development Goals (MDGs)

In September 2000, the United Nations General Assembly adopted the Millennium Declaration on a core of development issues including development and poverty reduction.

The resolution included freeing people from the abject and dehumanizing conditions of extreme poverty, creating national and global environments for development, gender equity and women empowerment, promotion of good governance among member states, promotion of trade and debt relief, and to address the special needs of small island developing countries and landlocked developing countries. The MDG directly related to environment is No. 7 which is concerned with ensuring environmental sustainability. These goals are envisaged to be attained by the year 2015; these respond to the world's main development challenges. All the goals cited are relevant for the area covered by the plan.

ICZM Policy and Action Plan

One of the major challenges facing the management of resources at the coast is a governance system based on a sectoral approach, which does not recognize the interconnectedness of ecosystems in resource management. Consequently, the sectoral approach to development planning and management, combined with population pressure and the intensity and complexity of human activities have resulted to resource use conflicts and adverse socio-economic and environmental effects. The draft Integrated Coastal Zone Management (ICZM) Policy and the Action Plan have identified various measures and strategies for implementation to reverse environmental degradation and promote sustainable utilization of coastal and marine resources. Development of this mangrove management plans is therefore part of the implementation of the ICZM Policy and Action Plan.

CHAPTER 4.0 RATIONALE FOR MANAGEMENT PLANNING

4.1 Value of the Forest Reserve

The planning procedure is motivated by the aspiration to use the best approach to manage the mangrove forest sustainably due to its uniqueness emanating from values. The forest is of considerable environmental and economic values that support the livelihood of communities living next to forests and beyond. The values of forest are divided into six categories as outlined in the sections below.

4.1.2 Research and educational value

The ecosystem and its associated plant and animal species including surrounding communities are a good laboratory for scientists studying different aspects therein. The scientists can generate important information to guide the development, conservation and management of the forest. Research and monitoring activities that have been taking place in the forest include ethno-botany, vegetation structure and composition, biodiversity and social economic surveys, and land use changes mapping. These have been undertaken by research institutions (KEFRI & KMFRI), Kenyan and international universities, especially those teaching environmental and natural resource management. In addition, such universities are using the forest as sites for educational tours and attachments for students studying environmental sciences.

4.1.3 Recreational value

Mombasa Kilindini has sceneries features and great potential for use as a recreation area that can be harnessed. There are unique geomorphologic features, cultural and historical sites that are of great tourism attraction. Mombasa being an ancient town hosts several tourists' attractions and world heritage sites among them Fort Jesus museum (UNESCO World Heritage site), sandy beaches and Mombasa Marine Park, The beaches along the Mombasa coastline are also an attraction to both domestic and international tourists. In addition, the forest has a variety of bird reptiles' species that attract visitors. As such, the area can offer a

diversity of tourism activities such as bird watching, board walking and fishing. It is possible to increase revenue by developing tourism in the area.

4.1.4 Climate modification

Due to the variations in altitude, aspect and vegetation cover, the forest influences the surroundings atmospheric temperatures and humidity that subsequently regulate the micro-climate of ecosystem and surrounding areas. The forests form major carbon sink as mangrove forest have the ability to sequestrate atmospheric Carbon dioxide (CO_2) that is required for photosynthesis. This results to production of Carbon, which is locked up in mangrove biomass.

4.1.5 Cultural and historical values

Ruins of forte Jesus is one of (a UNESCO World heritage site) site with long historical values. The forest has several shrines and one Kaya (Kaya Bombo along Bombo creek) which have both cultural and historical values.

4.1.6 Ecological values

The mangrove fauna play crucial functions within the ecosystem towards maintaining global biodiversity such as bioturbation of the soil, pollination (bees, birds), food sources, etc. Mangrove fauna such as the decapods crabs, polychaetes, mudskippers play a significant role in the functioning of the mangrove ecosystem. Some of the roles played by mangrove fauna including; bioturbation of soil through their burrowing activities affecting the soil sediment chemistry, topography and biogeochemistry by modifying particle size distribution and increasing soil aeration in the anoxic mangrove soil, they affect redox conditions and decrease the sulfide concentration in the sediment by burrowing, nutrient recycling and reduction of salinity regulation. Burrowing crabs create microhabitat for other fauna, for example the association of small burrowing fauna such as juvenile crabs, callianassids, polychaetes and gastropods within burrows of adult sesarmid crabs. Fiddler crabs feeding on

the sediment surface and plant matter promotes nutrient recycling and they thus play a significant role in controlling algal mat growth in mangrove substrata fundamental for the growth of mangrove seedlings and eventually for mangrove re-growth.

This demonstrate that mangrove ecosystem support adjacent ecosystems such as the coral reefs and seagrass beds by offering breeding and feeding grounds and by sediment traps thus offering protection. The benthic invertebrates are a source of food for crab larvae, which in turn are important food source for shallow-water fishes, and juvenile fish that enter the mangroves at high tide a clear indication that crabs help near shore fisheries. Adult crabs are food for endangered bird species such as the crab plover, *Dromas ardeola*. Mangrove crabs and snails are considered as keystone species. Herbivorous crabs are major seed predators in mangrove forests and thus play an important role in determining plant community structure through influencing the growth of mangrove seedlings by predation of propagules.

Based on the presence of diverse species, the ecosystem is of ecological values as all the species interact to influence the ecology of the forest.

4.1.7 Socio-economic values

The Mombasa mangroves are surrounded by settlement and other government infrastructure. Impacts from settlement have fundamentally changed the natural vegetation of the forest. Illegal poaching of trees, encroachment and firewood collection is a common phenomenon. Due to the scarcity of land in the area, illegal squatting and farming activities occur along the creeks. In a nutshell, the forest is therefore a vital source of support to the local community livelihood despite the use being illegal. There is a great potential that this management plan seeks to exploit in order to promote and enhance opportunities for community members to improve their livelihood through the benefits accruing from activities such as ecotourism enterprises, cultural tourism and community projects.

4.2 PROBLEM ANALYSIS

There has been an effort to conserve mangrove forests in Mombasa County and the region in general, however, despite the efforts, mangrove forests have continued to degrade. Although some success can be reported in some areas, managing sub-urban mangroves have been a challenge, hence threats and pressure on the forest persists. Some of this pressure arises from the way the community is organized in the exploitation of the resource. Cultural communities and resource user groups whose organization towards resource use is governed by cultural values and norms, urban population lack such structures. Lack of governance structures for peri-urban resource use and utilization has necessitated a need for adherent structures for management and governance, these include the formation of Community Forest Association (CFA), and a Participatory Forest Management Plan (PFMP) to guide in the use and management of mangrove resources. One main concern affecting mangroves forest is the lack of awareness of the importance of mangroves by the communities adjacent to the mangrove forest. This is contributed to by the composition of different cultures in the informal settlement. Mangrove forest resources are viewed as soft livelihood target by settlers as they set base and search for alternative livelihood.

Pressures and threats to mangrove forests mainly orient on unsustainable use of the forest driven by high poverty levels, population growth, low literacy levels and unemployment, lack of management skills and weak governance structures. Degradation of mangrove forest has been aggravated by lack of clear land tenure as majority of the people living in the adjacent land do not own the land in which they live. This has led to poor land use practices and clear felling of trees in the land adjacent to mangrove forest promoting erosion and sedimentation of mangrove forests. It is therefore necessary to invest in developing management and structure that would improve use and management of mangrove forest resources. Invest in creating awareness and enhancing mangrove knowledge to communities & schools to enable enhanced management and sustainable use of mangrove forest resources by community adjacent to the forest.

Threats and pressures that have affected Mangrove forest have been analyzed as follows:

a) Encroachment and excisions of Mangrove Forest for settlement, grazing and farming in the adjacent land.

b) Illegal exploitation of forest products for charcoal, poles and logs due to the high demand from the increasing population

c) Uncontrolled and unsustainable extraction of mangrove resource, mainly for commercial, subsistence and domestic use.

d) Pollution from various sources i.e. oil spill, solid and effluent waste leading to destruction of habitat.

e) Sedimentation in the mangrove forest mainly from poor land-use practices leading to death of mangrove and loss of habitats.

f) Climate change, the community is ill prepared to cope with emerging issues emanating from climate change.

g) Institutional constraints in forest management and governance, mainly in the human resources, finances and inadequate infrastructure.

h) High poverty level leads to mangrove resource degradation.

i) Conflicts arising between KFS and CFA in areas of access to resources licensing, cost and benefit sharing.

4.3 MANAGEMENT OBJECTIVES

Mangroves are habitat for fish and other wildlife, they provide many environmental services, such as; coastal protection, erosion control, and serve as a major sink for carbon; thus mitigating effects of climate change. In addition, mangroves provide direct economic products to the people in terms of firewood, building poles, charcoal; as well as habitats and nursery grounds for many commercially important fish and crustaceans. Communities also derive benefits from sustainable tourism. For these reasons, they should be protected and their natural ecology conserved. Any threats to the survival of mangroves must be mitigated. The management objectives of this management plan are therefore to:

a) To **conserve and manage mangrove wood and non-wood resources** on a sustained yield basis;
b) To **manage and protect mangrove areas for erosion control**, coastal stabilization, biodiversity conservation and fisheries;
c) To **promote community participation** in mangrove resource management for improved livelihoods;
d) To **strengthen institutional capacities** of the institutions responsible for mangrove management;
e) To **promote tourism and recreation** in mangrove areas; and
f) To **promote research, and education** for effective conservation and management of mangrove forests and associated ecosystems.

4.4 ZONATION

Rationale for Zoning

The mangrove Forests in Mombasa Kilindini were zoned using the multiple - use classification criteria, which considers the application of resource primary use along with secondary uses of the zoned areas. Broadly, the zones provide the application of specific policies and objectives to specific areas in conservation of biodiversity that have been considered in this management plan. The altitudinal and salinity characteristics of the forest have also influenced the zoning, with most areas in high tide targeted for rehabilitation and low tide areas restricted to protective management and biodiversity conservation with minimal human activity. The zonation also takes cognizance of areas of cultural significance to the local communities (Mijikendas). Mombasa mangrove forests have been divided into five zones. Consideration has been given to the capability, suitability, and feasible opportunities available that can be supported in different zones with due consideration to sustainability, protection and conservation, biodiversity conservation, policy provisions and needs of local community. These zones described below are based on specific management objectives:

Table 6: Proposed Forest Zones

Zone	Criteria	Management Objective	Management options
Conservation and Protection Zone	It is purely mangrove forests and serves as wildlife habitat (marine life)	Conserve unaltered and undisturbed wildlife habitats of mangroves cover only allowing non-consumptive utilization.	Conservation for ecosystem services, research and ecotourism with no extractive uses except for fish farming, bee keeping and education centers
Ecotourism Zone	Areas of cultural, beautiful scenery and visitor facilities	Development of ecotourism facilities	Promotion of ecotourism as an IGA for interested forest user groups
Rehabilitation Zone	All degraded sites in both the protected and gazette areas	Rehabilitation of all degraded areas	Rehabilitation of all degraded areas within the creeks, and Enrichment planting This temporary zone will be phased out within the lifespan of the PFMP.
Utilization Zone	The areas where controlled land use activities compatible with forestry can be practiced	Development of jetty to improve transport and communication Development for economic growth (special economic zone, SGR, Dongo Kundu bypass)	Support national growth Revenue generation
Intervention Zone	All the farm lands adjacent to the Mangrove forest	Promote IGAs to alleviate poverty and community dependence on Mangrove forests Promote farm forestry	Support nature based micro enterprises at community level. Conservation of riparian areas, improve farming methods and agro-forestry

Conservation and Protection Zone

The conservation and protection zone is an area covered by mangroves giving way to natural forest. The dominant mangrove vegetation is a mixture of *Ceriops tagal* and Rhizophora mucronata on the seaward side and at the landward belt *Avicennia marina* is dominant. There was no clear zonation of species mostly there were a mixture of species growing together e.g. *Avicinia-Rhizophora-Brugeria-Ceriops tagal* and *Sonneratia alba*. *Sonneratia alba* thrives in soft muddy sand and is the primary colonist on the open coast with *Rhizophora mucronata* up to the streams as *Rhizophora* is favored by soft silt. *Avicinia marina* is unable to tolerate continual water logging, probably because it prevents adequate aeration of the root system. The main objective is to conserve unaltered and undisturbed habitats of natural vegetation cover mainly allowing non-consumptive and controlled consumptive utilization.

Rehabilitation Zone

These are sites in the forests identified as degraded. This is a temporary zone earmarked for remediation and will be phased out once this is achieved. Degraded areas are majorly along the shoreline in Port Reitz Creek 80 ha, Tudor Creek 140 ha and Mtwapa Creek 20 ha which are caused mainly by frequent siltation, industrial waste and illegal harvesting. Similarly, water catchment areas that are degraded, the CFA will carry out reforestation along the water catchment areas such as along Mwache, Kombeni and Tsula Rivers. The community will participate in reforestation activities by use of species suitable for particular zones.

Figure 17: A degraded site along Tudor Creek

Biodiversity Conservation and Ecotourism Zone

Participatory Forest Management activities in the biodiversity and conservation zone in this plan have been based on recognition of the following aspects of Mombasa as an important ecosystem in the following areas:

- Biodiversity –there is significant need to ensure that any interaction is in the harmony with the broad biodiversity of the forest.
- The forest contains endemic species of both flora and fauna and any slight unchecked changes can mean extinction of these species.
- The guiding principal in management of this zone is to conserve and enhance unique biodiversity while at the same time ensure eco-friendly income generating activities. Among this can be guiding visitors for bird watching activities, nature walks, sacred groves where visitors can interact the traditions and cultural activities of Mijikenda people.

Intervention Zone

The intervention zone encompasses the adjacent farmlands. The main objective of this zone is to enhance rural development through promoting income generating activities with the aim of alleviating poverty and reducing community dependence on mangrove forests. Participation in the development of this zone will be through multi-stakeholder approach. During the field surveys for preparation of PFMP, the forest adjacent locations visited included Mtongwe, Miritini, Mikindani, Jomvu kuu, Maunguja, Junda, Mishomoroni and Majaoni Locations.

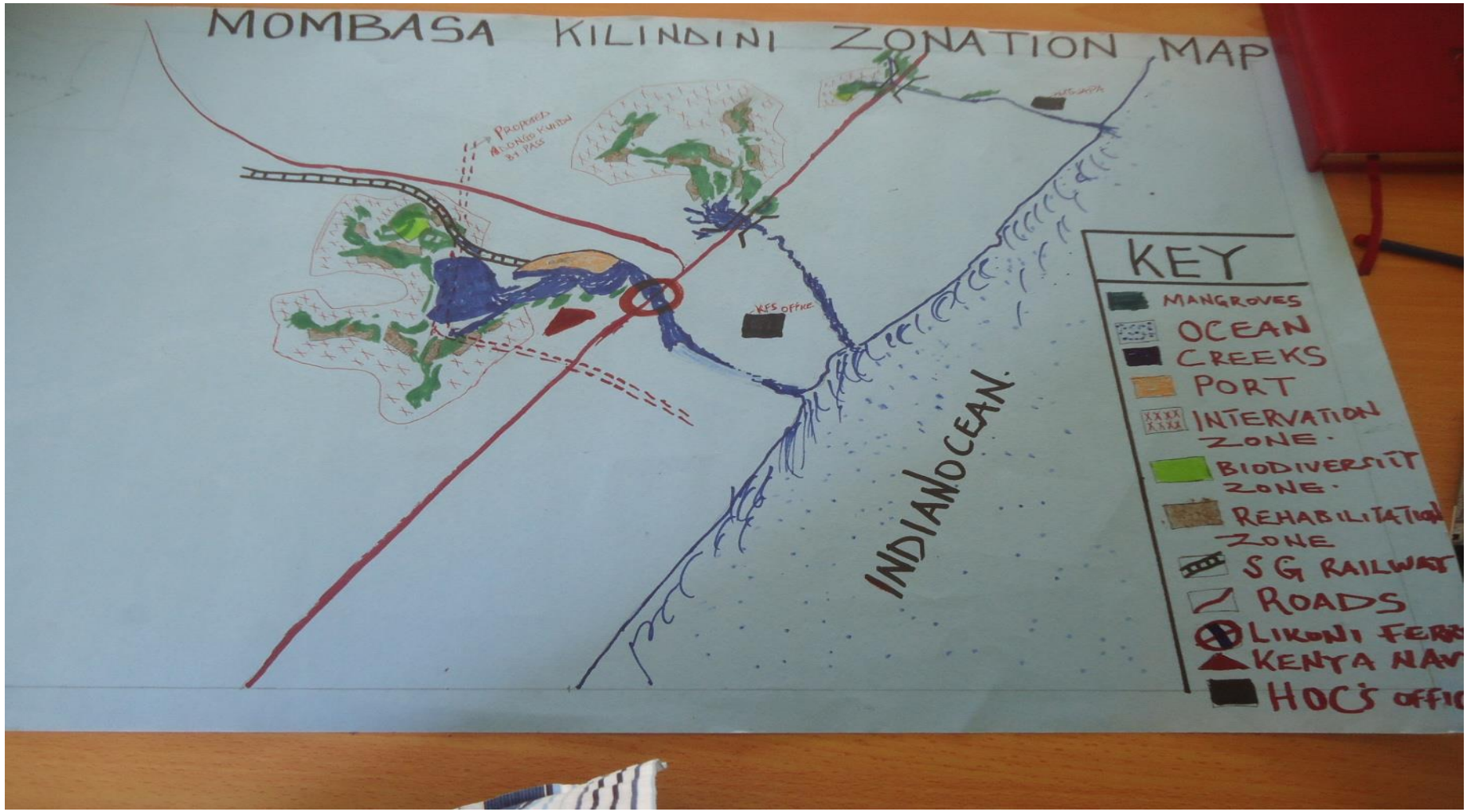

Figure 18: Mombasa Kilindini Participatory Zonation Map

5.0 MANAGEMENT PROGRAMMES

5.1 Biodiversity and Ecotourism Management Programme

Mombasa mangrove forest is along the coastal line mangroves stretching from Vanga in Kwale to Kiuga Lamu. This coastline is endowed with abundant flora and fauna and scenic beauty for tourism attraction. Mikindani, Tudor, Port Reitz and Mtwapa ecosystem rank high as important sites for biodiversity conservation. Mombasa mangrove forests have eight mangrove species of that provide a habitat of numerous micro and macro fauna such as fish, crustaceans, gastropods and the bivalves. This heterogeneity in species diversity is important sites for species conservation for tourism attraction. The biggest challenge that conservation faces in the Mangrove forest reserves is meeting the needs of the local and Peri-urban communities and their right to access the forest resources. Population increase in Mombasa has a large effect and put more pressure onto the forest as the need for resources and income increases.

The scenic sites coupled with human friendly diverse flora and fauna in Mombasa mangrove forest gives it a high potential for ecotourism. The Forests Act, 2005 section 47 (2a) provides for communities to enter into a management agreement with the KFS which confers upon the CFA user rights such as ecotourism and recreational activities. The sites of interest include; Majaoni, Junda, Mikindani, Mkupe and Port Reitz. Other factors that may contribute to ecotourism of the forest are its connectivity and accessibility as well as its strategic geographical position in the Coast. The forest is readily accessible from Kwale, Kilifi and Nairobi by the tarmac.

The general objective of the biodiversity and ecotourism development programme is to improve livelihoods through sustainable management and ecotourism

Management issues

- Lack of ecosystem biodiversity data
- The ecosystem has no well established ecotourism infrastructure and facilities
- Degraded ecotourism sites
- Lack of ecotourism promotion and marketing
- Inadequate community capacity to appropriately manage biodiversity and ecotourism resources

Management objectives

- To protect and conserve flora and fauna
- To promote and develop ecotourism infrastructure and facilities
- To establish and strengthen the capacity of community groups in ecotourism

Table 7: Summary of management actions for biodiversity and ecotourism management programme

Action	Unit	5yr targets	Means of verification	Budget	Time frame (yrs)				
					1	2	3	4	5
To protect and conserve flora and fauna									
Identification of critical biodiversity areas	No.	2	Number of sites identified		2	-	-	-	-
Protection of habitats from degradation	No.	2	Number of Ha						
Rehabilitation of degraded habitats	Ha	240	Number of Ha rehabilitated		X	X	X	X	X
Enhance community capacity to better manage biodiversity	No.	100	Number of people trained		20	20	20	20	20
To promote and develop ecotourism infrastructure and facilities									
Identification & mapping of ecotourism sites		6	Number of sites identified		6				
Capacity building on ecotourism initiatives	No.	7	No. of barazas		7				
Improve tourism marketing by linking with tourism marketing agencies.	No.	6	Number and type of linkage		6				
Develop tour-guiding and publicity materials.	No.	6	No. and type of publicity materials		6				
Product diversification	No.	3	No. and type of ecotourism products		3				
Development of visitor facilities and infrastructure	No.	6	No. of visitors facilities developed		2	1	1	1	1
To establish and strengthen the capacity of community groups in ecotourism									
Establish community ecotourism groups	No.	24	Group reports		5	5	5	5	4
Capacity build community ecotourism groups	No	24	Training reports		5	5	5	5	4

5.2 Forest Extension Programme

The forestry extension programme aims at meeting the general requirements of households in Mombasa and its environs in terms of fuel wood, poles, timber and other forest products by promoting tree planting on individual farmer's farms and institutions. This intervention will build the capacity of the local community hence reduce pressure on mangrove forest for forest products. The plan proposes to create awareness, promote agro-forestry, tree growing for commercial and domestic use, energy conservation and sustainable charcoal production. The areas adjacent to the mangrove forest especially in Kisauni, Likoni and Changamwe are primarily subsistence crop growing areas. Unsustainable charcoal production along the shoreline has lead to degradation of farmlands and mangroves. Poor farming practices on areas adjacent to the forest have lead to soil erosion and siltation of the ocean leading to death of mangrove forests. Some parts of the Mombasa experience water scarcity and rainy water harvesting and conservation will be emphasized. There are many CBOs and a few NGOs promoting mangrove planting campaigns in the area. However due to uncoordinated efforts very little has been achieved. To address and mitigate these challenges the following objectives and actions have been suggested for the forest extension programme.

Management Objectives

- To mobilization community and promote conservation awareness
- To promote soil and water conservation measures
- To encourage agroforestry

Table 8: Summary of management actions for forestry extension programme

Action	Unit	5 year target	Means of verification	Budget	Yr1	Yr2	Yr3	Yr4	Yr5
To mobilization community and promote conservation awareness									
Undertake sustainable community mobilization and awareness	No	6	Report		x	X	x	x	X
Capacity building the local community	no	50	Number of people trained		10	10	10	10	10
Promoting income generating activities	no	24	Number of IGAs promoted		4	5	5	5	5
To promote soil and water conservation measures									
Identification of areas to promote good farming practices	no	Areas identified and visited	Reports		X	X	X	X	X
Improve soil and water conservation measures	No	6 sites-one in every sub-County	Report		X	X	X	X	X
Water balance and demand management	lps	Various points in sub-counties	reports		x	X	x	x	X
To encourage agroforestry									
Enhance forest extension infrastructure	No	6	Reports		2	1	1	1	1
Promote tree planting within farms & adjacent areas	no	20	Reports and established woodlots		4	4	4	4	4
Increase income from tree products through value addition	no	2	Number of trainings on value addition		1	1			
Promote adoption of renewable energy technologies	HH	60	Level of acceptance of energy saving technology in 10 HH per sub-county.		12	12	12	12	12

5.3 Community Conservation and Socio-economic Development Programme

The involvement of the community in the management of the forest was prompted by the need for stakeholder participation due to the various challenges that were faced in forest management. Such challenges include illegal cutting of trees for poles and post, charcoal burning, and encroachment. As a result, in accordance to Forest Policy enactment 2005, the Mombasa Kilindini Community (MOKICFA) has since actively participated in Forest co-management hence leading to the reduction of the adverse destruction of the forest resources. The community conservation activities involve rehabilitation of degraded sites and forest protection through community scouts. Among the MOKICFA user groups that have emerged their livelihood through mangrove forest resources include firewood collectors, bee keepers, fishermen, herbalists and tour guides.

Management issues

- Provision of wood and non wood materials
- Poverty alleviation
- Illegal extraction of forest products
- Increase food production
- Protection of forest resources
- Degradation of mangrove forest
- Encroachment
- Waste management

Management objectives

- To promote agroforestry practices to reduce pressure from the forest
- To initiate Income Generation Activities(IGAs)
- To strengthen policing and patrols
- To encourage sustainable utilization of grazing areas
- To Protect rare and endangered medicinal species
- Capacity building on governance and conflict management

Table 9: Summary of actions for community conservation and development programme

Action	Unit	5yrs target	Means of verification	Budget	Time frame in years				
					1	2	3	4	5
To promote agroforestry practices to reduce pressure from the forest									
Establish on farm tree nurseries	No	50 trees nurseries	Reports		10	10	10	10	10
Establish commercial woodlots	No	20 farmers	Reports		4	4	4	4	4
To initiate Income Generation Activities (IGAs)									
Capacity building and sensitization	No	20 user groups	Report Photos Number of IGAs implemented		5	5	5	5	5
Formation of groups and initiation of IGAs: Bee keeping; Ecotourism; Herbalist; Fishermen	No	4 interest user groups	Reports and increased income			4			
Participatory monitoring and evaluation	No	20 visits	Report Photos		4	4	4	4	4

Action	Unit	5yrs target	Means of verification	Budget	Time frame in years				
					1	2	3	4	5
To strengthen forest protection through increased policing and patrols									
guards and community scouts 8 KFS,24 Scouts			security of the forest						
To protect rare and endangered medicinal species									
Carry out sensitization barazas on protection of endangered medicinal species	No	20	Reports Photos		4	4	4	4	4
By Laws enforcement and policing	Lps	Continuous patrols by rangers and scouts	Reduced illegal activities		x	x	x	x	X
Conduct EIA and Environmental audit.	No	various	Number of new sites assessed		x	x	x	x	x
Capacity building on governance and conflict management									
Training on governance	No	10	Reports		2	2	2	2	2
Development and Training on conflict management	No	10	Reports		2	2	2	2	2

5.4 Protection and Security Programme

Protection of the forest and security within the forest will be the responsibility of all stakeholders. The main challenges identified in Mombasa Kilindini Mangrove forest that require mitigation are illegal harvesting, encroachment, indiscriminate tree felling for charcoal production, oil spills and uncontrolled grazing. There is need for concerted effort in combating these threats. Other measures meant for protection of forests such as construction and maintenance of infrastructure such as roads, communication equipment shall mainly be the responsibility of KFS, County government and CFA. The control and protection of rehabilitated areas and prevention of further degradation is the responsibility of CFA and KFS. Protection and maintenance of infrastructure for protection is responsibility of CFA and KFS.

In order to address the protection and security challenges facing the forest, this management plan has identified management objectives of the protection and security programme. Under each management objective, relevant actions and activities are identified.

Management Issues

- Illegal logging
- Forest area encroachment
- Charcoal production
- Poor communication systems
- Inadequate enforcement

Management objectives

- To sensitize community on conservation and the effect of forest destruction
- To strengthen Law Enforcement
- To improve on the infrastructure
- To improve enforcement communication system

Table 10: Summary of management actions for protection and security programme

Action	Unit	5yr targets	Means of verification	Budget	Time frame (yrs)				
					1	2	3	4	5
To sensitize the community on conservation and the effect of forest destruction.									
Organize and Conduct community awareness barazas, radio talks and	No.	7	Records		7				
Educate community on alterlative source of energy (to reduce charcoal production)	no	6	reports		2	1	1	1	1
To strengthen Law Enforcement									
Explore to construct Forest Guard outposts in each creek.(Mikindani, Junda, Majaoni, Mkupe, Mtongwe and Jomvu)	No	6	Records Outpost houses		2	1	1	1	1
Recruit and train the forest scouts to assist the Forest Guards	No	72	Records Scouts		24	24	24		
Intensify forest policing patrols by Forest Guards and the Scouts	No		Records		X	X	X	x	X
To improve on infrastructure (forest access roads)									
Lobby to improve road infrastructure	Km	50	Records		X	X	X	x	X
To improve enforcement communication system									
Acquire and make use of modern radio communication system/Mobile phones/HF/VHF radios	No	24	Records		24				

5.4 Human Resource Development Programme

Human resource development is critical for swift and effective implementation of the plan. Human resource development on both local community and the KFS staff side will be necessary if success in forest co-management is to be realized.

Currently the community have come together to participate in forest management through their CFA, the community needs capacity building on management of community projects, proposal writing, leadership and governance, book keeping , resource mobilization, impact monitoring and evaluation, training more on community scouts and also exchange visits as part of learning process. This training will not only help improve the capacity of the local community as a partner in process of PFM but will go a long way towards enabling the CFA committee and broader community fully understand the whole process of participating in forest management and also develop some good and realistic expectations of this plan.

The community has also played a role in protection, which is voluntary. Currently the station has engaged four (4) community members as casuals at the nursery.

The workforce of Mombasa Ecosystem adds up to twenty-three (23) staff. The County consists of staff of various cadre headed by Ecosystem Conservator who coordinates all the activities within the County to achieve KFS objectives.

Table 11: Staff strength and requirement

Cadre	Current Staff	Establishment
Ecosystem Conservator	1	-
Senior Forester	1	1
Forester 1	2	-
Accountant	-	1
Accountant Ass.	1	-
Secretary	-	1
Inspector	-	1
Sergeant Forest Guard	1	-
Corporal Forest Guard	1	2
Constable Forest Guard	7	12
Driver	NIL	2
Coxswain	-	2
Clerk	NIL	1
Store Man/procurement	-	1
Support Staff	9	-
TOTAL	**23**	**24**

Management issues

- The County lacks sufficient members of staff.
- The county lacks modern and up to date technological facilities.
- The county lacks skill- specific staff.
- There is need for recruitment/deployment of new staff.
- There is need for training of staff on skills such as IT skills.
- The need to capacity build the local community on Participatory forest management

Management objectives

- To deploy/recruit new energetic staff who are qualified for the specific skills needed.
- To improve the staff working conditions
- To improve capacity of the locals to manage the forest resource sustainably

Table 12: Summary of management actions for human resources programme

Action	Unit	5 year target	Means of verification	Budget	Yr1	Yr2	Yr3	Yr4	Yr5
To deploy/recruit staff who are highly qualified for the specific skills needed									
Deploy and/or Recruit Forest ranger constables	No	12	Report			12			
To improve the staff working conditions									
Motivation of staff through promotions	Lps	Various	Reports		X	X	X	X	X
To hire clerk responsible for CFA office	No	1	Report						
To improve capacity and facilitate members of staff for relevant training									
Organize training through workshops and conferences on relevant and emerging issues and technologies for efficient management.	No	5	Training Reports		1	1	1	1	1
To improve capacity of the Community Forest Association members									
CFA training on proposal writing	No	5	Training reports		5	-	-	-	-
CFA training on leadership and governance	No	10	Training reports		2	2	2	2	2
CFA training on resource mobilization	No	5	Training reports		5	-	-	-	-
CFA Training on participatory impact monitoring and evaluation	No	20	Training reports		4	4	4	4	4

5.5 Infrastructure, Plants and Equipment Programme

Infrastructure and equipments are required to support the management of the Mombasa mangrove forest. These infrastructure range from feeder roads, telecommunication systems, nature trails, boardwalks, jetty, Landing sides, campsites, bandas, picnic sites, residential and non-residential buildings, outposts, vehicles, patrol boats, machinery and electricity. Some of these infrastructural facilities are available but will require regular maintenance through one-time and regular rehabilitation. Other will require installation or establishment. The CFA will liaise with KFS and other strategic partners and especially with the county government to ensure that they are in good working condition.

For efficient and quick access to the mangrove forest the County needs to construct and renovate existing piers, outposts and Landing sides in Mkupe, Mikindani, Jomvu and Majaoni. Other infrastructures that play a key role to the progress of Mombasa County include the office infrastructure, which needs upgrading in terms of technology and modern equipment. There is need for better equipment (furniture), enough working space and better staffing. This will greatly improve efficiency of services offered.

Management issues

- Poor road network and jetty within the forest areas
- Poorly equipped forest offices lacking essentials such as furniture, internet connections, telephone connectivity and transport
- Inadequate outposts and proper housing facilities for forest guards and members of staff
- There is no resource centre that could serve as an important learning for students taking part in research as well as members of the community
- The county has no vehicles and plants

Management objectives

- To improve road network and construction and repair of jetty
- To equip the forest with advanced modern facilities for efficient service provision
- To construct and repair the staff houses and outposts
- To construct and equip resource centers
- To construct office space for the CFA

Table 13: Summary of management actions for infrastructure and equipment programme

Action	Unit	5 year target	Means of verification	Budget	Time frame (yrs)				
					1	2	3	4	5
To improvement of forest infrastructure									
Lobby for grading and murraming of existing access roads	Km	50	Report		10	10	10	10	10
Construction and repairs of piers and landings sites	No	10	Reports		2	2	2	2	2
To improve both KFS and CFA infrastructure									
Construction, of resource centre (close to mangrove areas)	No	2	Report; photos			1	1	-	-
Purchase of rubber boat	No	1	Report; Photos			1			
Purchase of motor cycle	No	3	Report; photos			3			
Purchase of 4 x 4 light vehicle	No	1	Report; photos		1				
Purchase of a patrol boat	No	2	Report; photos		2				
Construction of staff houses (community scouts houses preferred to KFS staff houses). - Forest officers – 2; Forest Guards – 10	No		Report; photos		X	x	x	x	X
Construction of out posts	No	3	Report; photos			3			
Renovation of staff houses and outpost	No	1	Report; photos		1				
Installing I.T system	No	1	Reports; Photos		1				
Purchase of office equipment	Lps	Various	Report		X	x	x	x	X
Construct CFA office (close to mangrove)	No	1	Report; photos			1			

5.6 Education, Research and Monitoring

Education, Research and Monitoring is an important component in the adaptive management of ecosystems particularly in the assessment of progress, identification of changes and challenges. This programme provides the information base upon which inform interventions in other management programmes. Education, research and monitoring is important to ensure that the integrity of mangrove ecosystems is enhanced and the issues of concern on the key features of the mangroves are articulated and addressed through integrated management. The purpose of the research and education programme is to; promote conservation and management of mangrove forests in Mombasa Kilindini through problem oriented research, education and training.

The Education, Research and Monitoring programme is designed to address issues and challenges such as habitat loss, degradation and loss o f biodiversity. Other challenges include inadequate resources and capacity to undertake research and monitoring; poor adoption of research findings by relevant programmes; weak linkages between research and management of mangrove resources; poor dissemination of research findings; inadequate knowledge on interaction of mangroves, true economic value of mangrove and associated ecosystems;; and lack of long-term mangroves ecological data.

Management objectives

- To enhance the community's understanding on the current status of the Mombasa Kilindini mangrove forest
- To promote habitat and biodiversity protection and conservation
- To disseminate information on existing research findings
- To enhance ecological and socio-economic research, monitoring and dissemination
- To create awareness on the environmental and economic value of mangroves

Table 14: Summary of management actions for education, research and monitoring programme

Objectives and Action	Unit	5 yr targets	Means of verification	Budget	Time frame (yrs)				
					1	2	3	4	5
To enhanced community's understanding on the current status of the Mombasa Kilindini mangrove forest									
Conduct a current status of the mangrove forest resources	No	1	Report		1				
Sensitize local communities on the linkages between mangrove forest and community livelihoods	No	1	Report		1				
To promote habitat and biodiversity protection and conservation									
Undertake research on stocking level, density and growth dynamics of mangroves.	No	3	Report		1	1	1		
Identify and map conservation target areas based on key ecological attributes	No.	3	Report		3				
Identify causes and levels of habitat degradation	Nos	1	Report		1				
prepare training manuals in biodiversity protection and conservation for communities	no	2	manuals		2				
To disseminate information on existing research findings									

Objectives and Action	**Unit**	**5 yr targets**	**Means of verification**	**Budget**	**Time frame (yrs)**				
					1	**2**	**3**	**4**	**5**
Develop linkages with relevant research institutions e.g. KMFRI, KEFRI, KWS,	No	3	Linkages		3				
Disseminate the research findings from the research institutions	No	4	reports		x				
To enhance ecological and socio-economic research, monitoring and dissemination									
Mainstream mangrove research into institutional work plans	No	5	Work plans		1	1	1	1	1
Collaborate with institutions of higher learning to develop relevant education and training programmes	No	5	Training		1	1		1	1
Capacity building for scientists and managers on mangrove monitoring reporting and verification	No	5	Reports		1	1	1	1	1
Develop technical management orders for mangrove management	no	1	Technical orders		1				
To create awareness on the environmental and economic value of mangroves									
Develop and maintain a mangrove database	No	1	Reports		X	x	x	x	x
Prepare awareness materials e.g. documentaries, brochures, fact-sheets, posters, press releases on mangroves issues	No	1000	reports		200	200	200	200	200
Disseminate produced awareness materials through schools, public barazas, exhibitions, print and electronic media	%	100			20	20	20	20	20

CHAPTER 6: PLAN IMPLEMENTATION AND DEVELOPMENT

6.1 Financial Management

A financial management system will be developed for the Mombasa Kilindini Community forest association to guide the transparent management of financial resources. The financial management will involve appropriate regulation of recurrent and development budgets. Expenditure will follow approved budget allocations for prescribed activities. Revenue collection will be in accordance with the Kenya Forest Service regulations and procedures to reduce loss or misappropriation of funds by those responsible for its custody. Budget reviews will be done annually in order to prioritize the operations in accordance with available funds and prevailing inflation rates at the time of review. An inflation rate of 10% in each year is provided for in the development budgets in this management plan; annual financial allocations will need to be increased by this percentage during the plan period.

However, the prevailing Central Bank Rate (CBR) will guide the inflation rate. The proposed policy on retaining part of the revenues generated in the forest should be followed according to management agreement that will be signed between KFS and CFA. This will enable CFA to plough back some of the revenues it generates to support conservation efforts within the mangrove forest.

6.1.1 Resource Mobilization

In the initial period, much funds will be needed for capital development i.e. construction of buildings and outposts. The managing institutions necessitating financial support to be sought as early as possible from other sources during the plan period may not meet the resources required for capital development.

Development budgets will be managed following the financial regulations of the KFS where it applies and other applicable government regulations. Annual recurrent budgets to cover the day-to-day running costs and activities within the Mombasa Kilindini mangrove forest will be prepared by the respective implementing departments. Budgetary allocation for Kenya Forest

Service during the plan period will need to be increased substantially to accomplish the recommended activities active participation.

MOKICFA will have a five-year investment plan to ensure that the Management Plan is implemented effectively without disruption and constrains. An investment plan should have clear budget for the next five years for easy selling of the plan.

Such a plan need to be linked to the current KFS strategic plan for sustainability. Such as plan could look into local resources generation with activities being supported directly from institution such as Mombasa County Government, which can support programme such as tree planting, and local community scouts. Other institutions can support the forest management through a clear investment approach.

6.1.2 Revenue Generation and Projections 2015-2019

The main source of revenue once the forest management plan is implemented will come from ecotourism, and mangrove forest products fuel wood, timber and non-timber products like honey, medicinal herbs among others.

6.2 Environmental Impact Assessment (EIA)

Planning of conservation and development activities within the Mombasa mangrove will follow a holistic approach. Environmental Impact Assessments will be carried out on planned development activities before they are undertaken. Environmental Impact Assessment will be designed to ensure that negative impacts are recognized and mitigated against.

6.3 Monitoring and Evaluation

Monitoring and evaluation (M&E) of the management plan is essential since it provides a basis for observation, adjustment and improvement of the targeted activities and assessment of the achievements. Monitoring and evaluation of this management plan will be based on annual work plans that will be prepared for the Mombasa mangrove forest.

To ensure that implementation of the management plan is on course, a monitoring and evaluation plan subject to regular review during the plan period is to be formulated. Quarterly and annual M&E will address the Management Programmes outlined in the plan. A mid and end term evaluation will be carried out to assess progress in the implementation of planned activities and achievement of objectives. The evaluation report will also provide essential information to revise the management plan.

6.3.1 Methods

Monitoring shall be conducted on a continuous basis while evaluation will be done mid-term period and after the five years. Continuous monitoring during the implementation period will be maintained through preparation and submission of monthly, quarterly, half year and annual progress reports from the implementing departments. Both will be undertaken in a consultative manner and will aim at assessing achievement of objectives and addressing constraints encountered in the process. Monitoring and evaluation will provide information essential in revision of the management plan.

6.3.2 Responsibilities

The lead implementing agencies will undertake monitoring and evaluation of the implementation of the plan. Field officers will be responsible for submitting monthly, quarterly, half–year and annual progress reports to the heads of their institutions. It is notable that for each action in the management plan and responsibilities assigned to particular institutions or stakeholders to assess the progress made by the implementing department/stakeholder. The Monitoring and Evaluation Teams of KFS and MOKICFA will conduct periodical monitoring and evaluation.

6.3.3 Success indicators

Success indicators provide a measure of assessing whether set targets are progressively being achieved. Success indicators agreed upon between the lead agencies for different categories of management activities will serve to assess the achievement of the set targets for each activity in the management plan monitoring indicators.

Table 15: Monitoring and Evaluation Indicators

Programmes	**Indicators of Success**	**Means of Verification**	**Assumptions**
Natural Forest Management	State/ quality of the natural forest Area rehabilitated	KFS,KWS and CFA , NGOs records Photographs Monitoring and evaluation reports	The Plan is successfully implemented Good working relationship between stakeholders Availability of resources
Biodiversity conservation and ecotourism development	Increase in species biodiversity. No. of ecotourism sites and infrastructure developed No. of tourists	Surveys on biodiversity and infrastructure Records, photographs and reports	The Plan is successfully implemented Good working relationship between stakeholders Availability of resources
Protection and Security	Reduced incidences of illegal harvesting reported Performance of the forest Rangers and Community scouts	KFS, KWS and CFA records and reports Police records	The Plan is successfully completed and implemented Cooperation from CFA/ community members
Community Participation and development	Number and types of IGAs Composition of governance and decision-making structure	CFA records Community management committees	The Plan is successfully completed and implemented Cooperation from CFA/ community members Good working relationship between

Programmes	**Indicators of Success**	**Means of Verification**	**Assumptions**
			KFS and CFA Availability of funds
	Number of NBEs Total income generated from NBEs % of household budget deriving from NBEs Number of people employed Number and type of technologies adopted Crop and livestock yields Systems of crop and livestock productions being practiced -Number and nature of cottage industries applied Number of trainings held and exposure/exchange tours arranged Number and types of products in the market	KFS and CFA records CFA financial records CFA minutes Site visits M&E Reports Training Reports KFS/CFA records Reports from partners Market surveys	The Plan is successfully implemented Cooperation from community members Success in NBE development Availability of resources and markets
Human Resources	Number of people employed Number of people trained Number of community scouts.	KFS, KWS and CFA records Monitoring and evaluation reports	The Plan is successfully implemented Availability of funds

Programmes	**Indicators of Success**	**Means of Verification**	**Assumptions**
	Number of community members involved in mangrove forest activities.		
Infrastructure and Equipment	Number and type of infrastructure developed	KFS, KWS and CFA and records Monitoring and evaluation reports	The Plan is successfully implemented Availability of funds
Research, Education and Monitoring	Number and type of research and surveys undertaken Technologies innovated and adopted State/ quality of the forest ecosystem	Research reports Monitoring and evaluation reports	The Plan is successfully completed Cooperation of all stakeholders The ecosystem maintain local and national importance

6.4 Plan Implementation Organization Structure

As shown below, implementation of the management plan will be done through a Conservation Committee. The Committee will provide a forum for dialogue, consensus building, priority setting and balancing of the various interests involved. The chairman of the committee will be the Ecosystem Conservator, Mombasa.

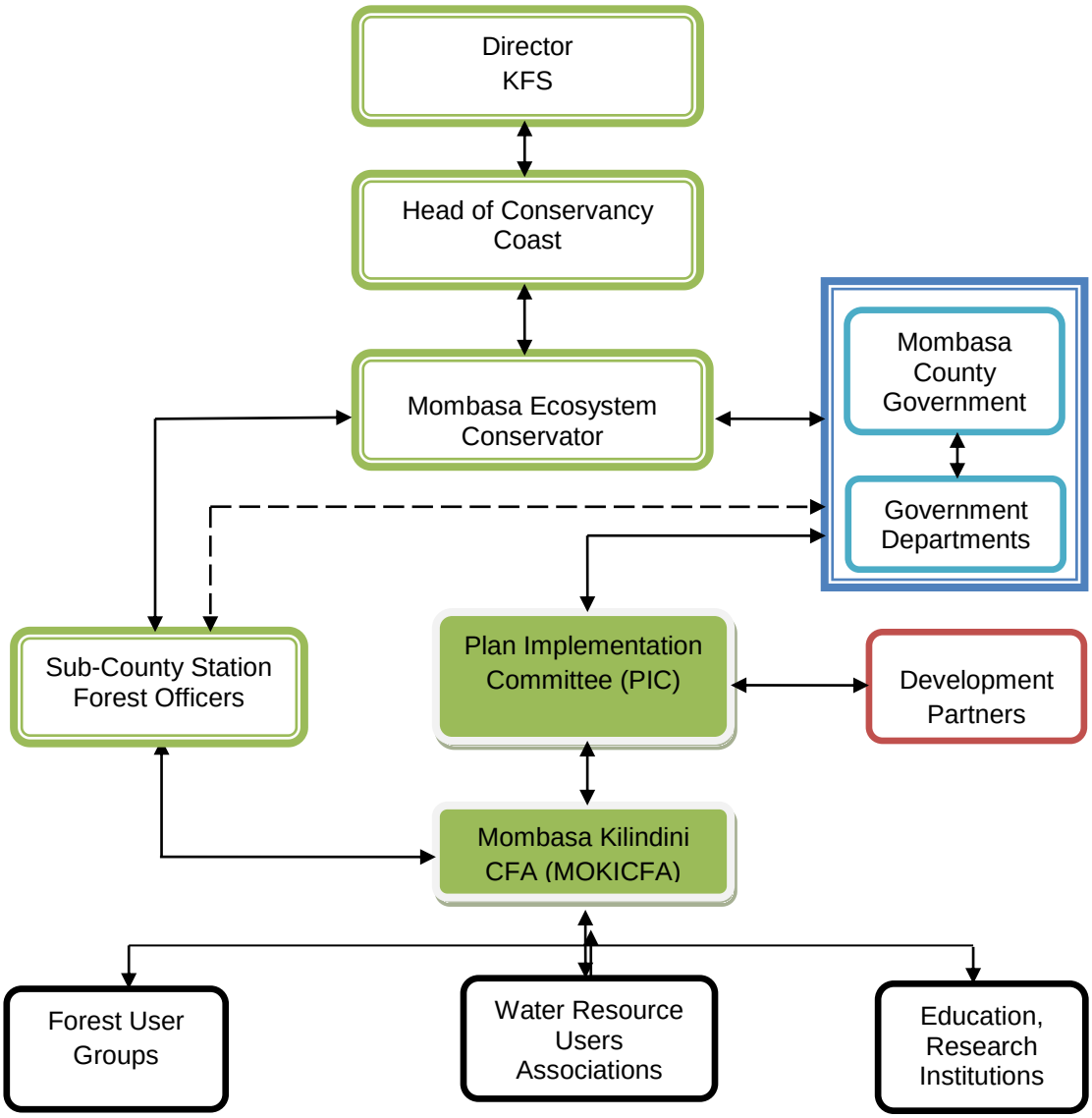

Figure 19: Plan Implementation Organizational Structure

Plan Implementation Organization Structure

The Mombasa Kilindini committee will determine the membership of the implementation Committee depending on the prevailing activities. (Participatory Forest Management Rules (2009) in reference to rule no.46.

Guiding principles for the Implementation of the Plan

Planning, implementation, monitoring and evaluation, the plan will be guided by the following principles throughout the plan period: -

(a) Gender equity: Gender considerations shall be integrated at all levels of plan implementation. Equitable representation of women in meetings and decision-making processes will be sought to enhance the role played by them in the management and conservation of the Mombasa mangroves. Gender balance will be established where possible and all groups (youth, elderly, disadvantaged) will be considered in the various sub-committees and in field activities. Awareness creation among the groups is enhanced to highlight the importance and value of involving all interest groups in conservation and other activities

(b) Transparency: This will be maintained in all decision-making processes to ensure that key stakeholders are kept informed on the on-going activities and of future envisaged plans. This approach is essential towards developing, maintaining and improving rapport between the institutions/organizations that will be involved in the implementation of the management plan.

Community participation in plan implementation

Local Forest adjacent communities (FAC) will participate in the plan implementation through the CFA (MOKICFA).

Institutional collaboration

KFS realizes that some of the programmes proposed in this PFMP require collaboration with other institutions. To this effect collaboration especially with KWS, KMFRI, WRMA, Fisheries and KEFRI are considered paramount.

Sustainability

The plan must encourage conservation, protection and utilization of the Mombasa mangroves taking cognizance that this ecosystem and the associated resources are finite.

REFERENCES

Bosire, J.O.; Kaino, J.J. and others (2014). Mangroves in peril: unprecedented degradation rates of peri-urban mangroves in Kenya. Biogeosciences.

GOK (1970).The Government Land Act Chapter 280 Laws of Kenya.The Government Printer, Nairobi, Kenya.

GOK (1977). The Registered Land Act Chapter 300 Laws of Kenya.The Government Printer, Nairobi, Kenya.

GOK (1986). The Local Government Act Chapter 265 Laws of Kenya. The Government Printer, Nairobi, Kenya.

GOK (1989). The Wildlife (Conservation and Management) Act Chapter 376 Laws of Kenya. The Government Printer, Nairobi, Kenya.

GOK (1994). The Kenya National Environment Plan (NEAP) Report. Ministry of Environment and Natural Resources. The Government Printer, Nairobi, Kenya.

GOK (1999). The Environmental Management and Coordination Act (EMCA). The Government Printer, Nairobi, Kenya

GOK (2002). The Water Act, 2002. The Government Printer, Nairobi, Kenya.

GOK (2005).The Forests Act, 2005. The Government Printer, Nairobi, Kenya.

GOK (2005). Sessional Paper No. 9 of 2005 on Forest Policy (Draft).The Government Printer, Nairobi, Kenya.

GOK (2005). Sessional Paper No. 9 of 2005 on Forest Policy (Draft). The Government Printer, Nairobi, Kenya.

KFS, (2007) Management Plan Preparation Manual. KFS, Nairobi, Kenya (unpublished)

GOK (2008). Vision 2030, The Government Printer, Nairobi, Kenya.

GOK, (1970). Trust Land Act Chapter 288, The Government Printer, Nairobi, Kenya.

GOK, (1994). Agriculture/National Food Policy (Sessional Paper No. 2), The Government Printer, Nairobi, Kenya.

GOK, (2006). Energy Act, The Government Printer, Nairobi, Kenya.

GOK, Agriculture Act Chapter 318, The Government Printer, Nairobi, Kenya

GOK, Grass Fires Act, Chapter 327, The Government Printer, Nairobi, Kenya.

KCDP (2015). National Mangrove Management Plan. Kenya Marine & Fisheries Research Institute, Mombasa Kenya.

KFS, (2007).Management Plan Preparation Manual. KFS, Nairobi, Kenya (unpublished).

MENR. (1994). Kenya Forestry Master Plan: Development Programmes. Ministry of Environment and Natural Resources: Nairobi, Kenya.

APPENDICES

Appendix 1: List of LPT members

	Name	Affiliation
1.	J. Auma	MOKICFA
2.	H. Chenya	MOKICFA
3.	John Kareko	NatureCom Group
4.	Douglas Nandwa	MOKICFA
5.	Lucas Fondo	MOKICFA
6.	Joseph Kibugi	Kenya Forest Service
7.	Dishon Murage	NatureCom Group
8.	Felicia Muriuki	Naturecom Group
9.	Philis Nzioka	MOKICFA
10.	Mbarak	MOKICFA
11.	Rebecca Mungani	Kenya Forest Service
12.	John Nyamwaya	MOKICFA
13.	Linet Jeptum	Kenya Forest Service
14.	Rebecca Mungani	Kenya Forest Service

Appendix 2: List of participants' forest and household survey

	Name	Affiliation
1.	John Kareko	NatureCom
2.	Douglas Nandwa	MOKICFA
3.	Lucas Fondo	MOKICFA
4.	Joseph Kibugi	Kenya Forest Service
5.	Dishon Murage	NatureCom
6.	Jacqueline Mdamu	Kenya Forest Service
7.	Linet Jeptum	Kenya Forest Service
8.	Rebecca Mungani	Kenya Forest Service
9.	John Nyamwaya	MOKICFA

Appendix 3: Technical Working Group Members

	Name	Affiliation
1.	Albert Nyabuti	Kenya Forest Service
2.	Ann Itubo	Kenya Forest Service
3.	Bernard Orinda	Kenya Forest Service
4.	Alex Kathuku	Kenya Forest Service
5.	Albert Gamoe	Kenya Wildlife Service
6.	William Odeyo	NEMA Kenya
7.	John Kareko	NatureCom Group
8.	Dishon Murage	Naturecom Group
9.	Tsofa Mweni	Wildlife Clubs of Kenya
10.	Michael Mbaru	Kenya Maritime Authority
11.	George Onduso	Kenya Marine Fisheries Research Institute
12.	Fya Onduso	Mombasa County Government
13.	Dauglas Nandwa	MOKICFA

Sub-committee Technical Working Group

	Name	Affiliation
1.	Albert Nyabuti	Kenya Forest Service
2.	Alex Kathuku	Kenya Forest Service
3.	John Kareko	NatureCom Group
4.	Douglas Nandwa	MOKICFA
5.	Dishon Murage	NatureCom Group

Appendix 4: Stakeholders Final Validation Workshop on 16th October 2015

	Name	Affiliation
1.	Salim Idi Madizi	Magoda Community
2.	Eunice Kalewa	Jundoa Y. Group
3.	Victoria Mae	Vixbel Enterprise
4.	Mohamed Muazima	Magoda community development
5.	Masud Mohamed	Mkupe Group
6.	Josephine Dzuya	Mwachideco SHG
7.	Mwinga Gonzi	Amani Jipange SHG
8.	Stellamaris Muthike	Kenya Maritime Authority
9.	Jofa Mweni	WCK – Mombasa
10.	John Kaneko	Naturecom
11.	Lucas C. Fondo	Clarion / Mokcfa
12.	Nicholas M. Mwiyso	Kenya Forest Services
13.	Jacqueline Mdamu	Kenya Forest Services
14.	Linet Jeptum	KFS
15.	Grace Waudo	KFS
16.	Gamoe Albert	KWS
17.	Sauid Isa	County
18.	Mbaarak Abdalla	Brain Youth Group
19.	George Ongaya	MOKECFA/COBWEB
20.	Ibrahim H. Toy	Bigship CBO
21.	Rebecca Mung'ri	KFS
22.	Alex M. Kahuku	KFS

23.	Mercy Mbogha	YWCA /KCFCF
24.	Janette Nemo	Bigship CBO
25.	Wilson Guya	MOKICFA
26.	John O. Nyamwaya	MOKICFA
27.	Risper A. Oteke	MOKICFA
28.	Brenda M. Nteere	MOKICFA
29.	Denis Koech	NEMA
30.	Dowatah Muthoni	MOKICFA
31.	Christine Makoki	MOKICFA
32.	Artlight Nabwoba Makokha	MOKICFA
33.	Mary Akinyi	MOKICFA
34.	Petronila Kwamboka	MOKICFA
35.	Akullati Khamis	MOKICFA
36.	Joan Auma Ogumo	MOKICFA
37.	Tabitha Mwikali Musau	MOKICFA
38.	Urbanus Matungi	KFS
39.	Douglas Nandwa	MOKICFA