

# Kakamega Forest Ecosystem Management Plan 2012-2022



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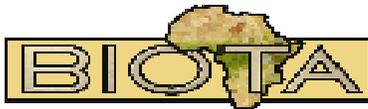
# Kakamega Forest Ecosystem Management Plan 2012 -2022

**February 2012**

*Planning carried out by*

KFE Managers  
KFE Stakeholders  
KWS Biodiversity Planning & Environmental Compliance  
Department  
&  
Forest Planning and Information Systems Department





This General Management Plan was co-funded and developed through a participatory planning process involving a cross section of Kakamega Forest Ecosystem stakeholders, under the coordination of a Core Planning Team comprising representatives from Kakamega Forest Ecosystem managers, KWS & KFS Headquarter planners.

Funding for the planning process was provided by BIOTA East Africa project with co-financing from both KWS & KFS. BIOTA also offered technical input through provision of planning resource base information based on their rich scientific data and geo-data that were used in the development of the Zonation Scheme.

The National Museums of Kenya provided additional planning information for development of the Ecological and Forest Resource Management Programmes.

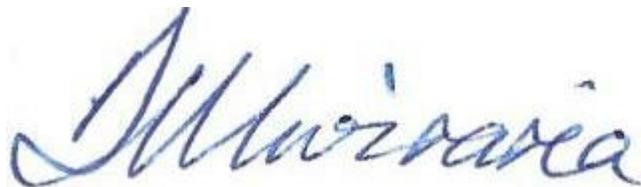
# Approval Page

The Board of Trustees and the management of the Kenya Wildlife Service and the Kenya Forest Service have approved the implementation of this management plan for the Kakamega Forest Ecosystem.

*On behalf of the* **KENYA WILDLIFE SERVICE**



**Mr. Julius Kipng'etich**  
Director

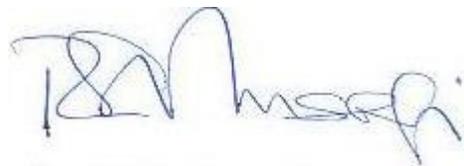


**Mr. David Mwiraria**  
Chairman, Board of Trustees

*On behalf of the* **KENYA FOREST SERVICE**



**Mr. David Mbugua**  
Director



**Prof. Richard Musangi**  
Chairman, Board of Management

# Executive Summary

This new 10-year management plan (2012-2022) for the Kakamega Forest Ecosystem (KFE) is a collaborative initiative between Kenya Wildlife Service (KWS) and Kenya Forest Service (KFS) and is meant to provide an integrative framework for ecosystem management. The KWS and KFS are the prime owners of this management plan but great emphasis has been placed on the participation of a wide array of stakeholders. The plan has been developed with the recognition of various interest groups that have a venture in the KFE, and their interests have been considered to gain the much needed stakeholder support in ecosystem management. To this end, both KWS and KFS enlisted financial support of BIOTA East Africa to carry out the planning process and in offering technical backstopping. These two government institutions in turn provided the planning technical assistance and financial support to facilitate the planning process. The planning process involved extensive stakeholder participation. Hence, this plan is the result of the minds of a large cross section of the KFE's stakeholders, and represents a shared consensus viewpoint on how the forest ecosystem should be conserved and managed for the present and future generations.

The KFE Management Plan is an integrated plan developed in accordance with the KWS Protected Area Planning Framework (PAPF) and the KFS Participatory Forest Management guidelines (PFM). Both advocate for planning approaches and wide stakeholder participation. This Management Plan sets out the management approach and goals, together with a framework for decision making, to apply in the KFE over the next ten years. The Plan is a practical tool to support and guide coordinated and integrated management of natural resources in the KFE. The KFE covers distinct forest management units as follows: Kakamega Forest Reserve, Kibiri forest in Vihiga District, Yala River Nature Reserve, Isecheno Nature Reserve, Malava and Bunyala Forests all under the management of the KFS and the Kakamega and National Reserves under the management of KWS, all of which make the Kakamega Forest Ecosystem. It is anticipated that the plan will provide a mechanism for increasing the accountability of the protected area managers in reference to the identified targets and performance standards to be attained during plan implementation. The plan has also been structured in a way that the managers can easily draw up work plans for staff, assign duties, and monitor and assess performance. It also discourages a manager from 'acting on whim'.

On the other hand, the plan will guide KFE's stakeholders on how they can contribute to the management of the ecosystem in a collaborative manner. In order to achieve this, the plan sets out a set of stakeholder and management agreed goals (the purpose statements and objectives) that KFE managers will aim to achieve, and a series of prescriptions and management actions that will be implemented in order to ensure these goals are achieved. The plan mainly focuses on the management of the forest blocks themselves, although, to a limited degree, it does also address issues of concern in the forest adjacent areas that interact with the protected areas.

The KFE plan development process and plan structure are set out according to the integrated PAPF and PFM specifications, and aims to ensure the plan can be easily understood by stakeholders and implemented by KFE management. At the heart of the plan are the **Zonation scheme** and the **five management programmes**, each of which cover an essential aspect of KFE management. These five programmes are:

- ▶ ***Ecological Management Programme***
- ▶ ***Tourism Development and Management Programme***
- ▶ ***Forest Resource Management Programme***

- ▶ **Community Outreach and Education Management Programme**
- ▶ **Forest Operations & Security Management Programme**

## **KFE Purpose and Values**

The purpose statement for the KFE summarizes the reasons for the establishment of the ecosystem components as protected areas. The main aim of this plan is to ensure that the PA purpose is achieved. The development of the Purpose Statement was based on stakeholder identification of the KFE’s “Exceptional Resource Values” (ERVs), in terms of biodiversity, scenic, social and cultural values. The top five ERVs prioritized by stakeholders are: the KFE’s De Brazza’s monkey population, the area’s rich diversity of bird species; (biodiversity); the Lirhanda hill that offers the highest point to view the forest canopy (scenic), the rich culture of communities living around the area (cultural); and a source of livelihood (socio-economic).

The primary purpose of the KFE was defined by the area’s stakeholders as:

***“To protect and conserve a relic of the Eastern most Guinea Congolean rainforest and its associated rare, threatened and endemic forest fauna and flora and sustainably utilize both wood and non-wood forest products for present and future generations.”***

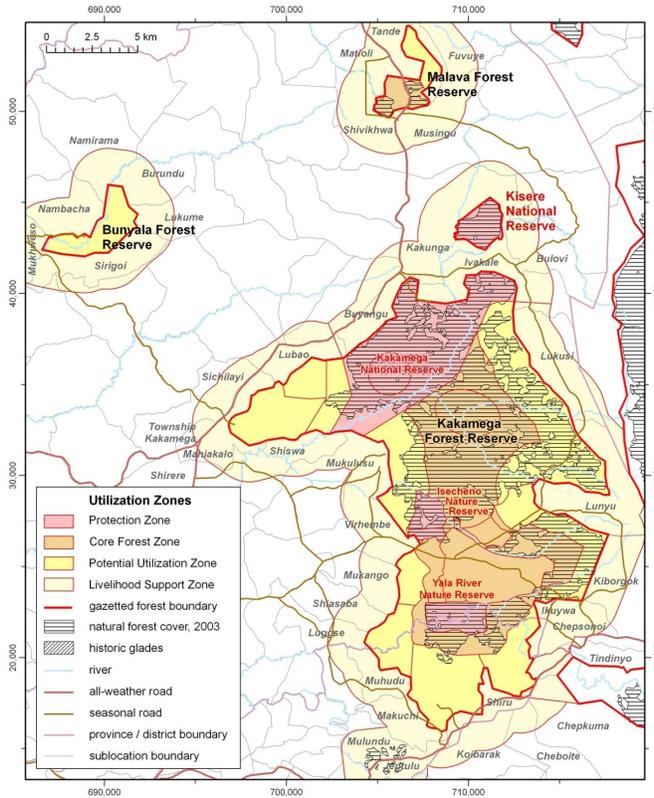
## **KFE Zonation Scheme**

The KFE zonation scheme takes into account the forest ecosystem structure, function and sensitivity, as well as the opportunities for, and impacts of, existing and potential public use. It aims to provide a framework for reconciling management needs of **conserving natural resources, promoting sustainable use of forest resources** and **regulating and promoting visitor use**. This zonation scheme reflects the different management objectives for the varying use of the forest ecosystem and supports decentralized management of the forest ecosystem. In order to achieve the forest conservation requirements, and ability and suitability of the KFE to provide opportunities for visitor use, the KFE has been divided into six Management Sectors, four Forest Resource Use Zones and three Visitor Use Zones. This is summarised below:

### **Forest Resource Use Zones**

The Forest Resource Use zonation provides a framework for guided utilization of the forest ecosystem on a sustainable basis. Four forest resource use zones have been identified and where possible boundaries aligned to identifiable physical features on the ground for easier recognition. The four forest resource use zonation scheme divides the KFE into four zones, Protection Zone, Core Forest Zone, Potential Utilization Zone and Livelihood Support Zone. This is discussed in detail in the zonation scheme section.

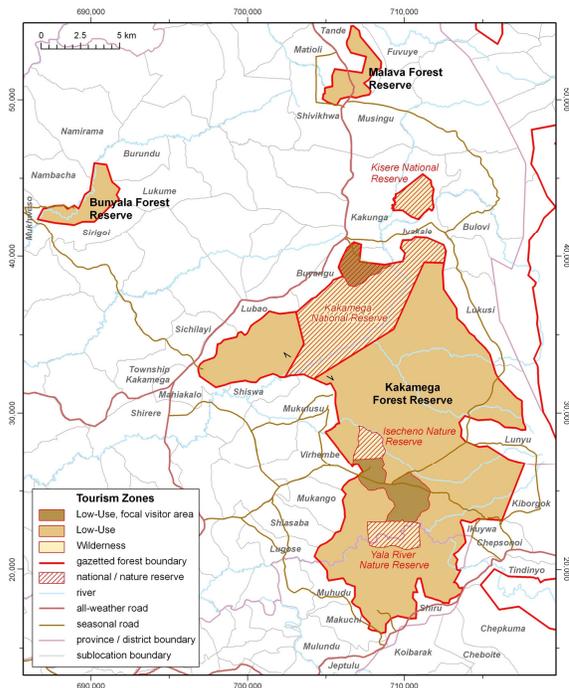
## Management Sectors



KFE is categorized into five management sectors to facilitate decentralized and ensure administrative and management presence across the entire ecosystem. Three sectors are managed by KFS through Zonal Forest Managers while KWS manages the other two areas through a Warden in charge. These management sectors are:

- The main block in Kakamega Forest Zone (Kakamega Forest Reserve, Ischeno Nature Reserve and Yala River Nature Reserve northern side) under KFS Kakamega Forest Station
- The main block in Kakamega District (Kakamega National Reserve including and Kisere Forest) under KWS Buyangu office;
- The Kibiri forest and Yala River Nature Reserve southern side under KFS Kibiri Forest Station in Vihiga Zone;
- Malava Forest Reserve under KFS Malava Forest Station; and
- Bunyala Forest Reserve under KFS Bunyala Forest Station.

## Visitor Use Zones



KFE has been divided into three Visitor Use Zones which provide different visitor activities and use levels. The three visitor use zones are: Low Use, Focal Visitor Area, Low Use Zone and Wilderness Zone. The visitor use zones have been developed to enable the dispersal of visitors across the KFE and the type of visitor use to be managed spatially across the ecosystem. The scheme aims at promoting a well managed, high-quality, and nature based tourism that has minimal environmental impacts in the Low Use Zone, Focal Visitor Area, which is believed to be the highly utilized zone in terms of visitation. The zonation has been developed closely with the Tourism Development and Management Programme and ensures the dispersal of visitors to other zones across the KFE. It provides the provisions for increased intensity and variety of visitor use in both the low and wilderness zones. To enhance the ease of implementation,

all zone boundaries are aligned with easily visible physical features, such as roads, rivers, valleys or nature trails. The Visitor Use Zone was developed based on the existing statistics on visitation, bed capacity in the region, and existing and proposed tourism accommodation facilities. With this consideration the zonal accommodation prescriptions specify that apart from the proposed eco-lodge, no more new facilities are permitted in the Low Use, Focal Visitor Area while a significant expansion of facilities in the wilderness zone and low use zones is permitted. However, even with the planned expansion, it is deemed important to prevent over utilization of the forest ecosystem but instead promote eco-friendly tourism. Further expansion in these zones may be appropriate in the future, contingent on an assessment of the quality of the tourism product being provided and its environmental impacts.

The key features of each of the three visitor use zones are summarised in the following paragraphs:

- ▶ The **Low Use, Focal Visitor Area:** It has high densities of primates and bird life making it the most preferred area for tourism. As part of visitor activity prescription for this zone, visitors will be required to stick to prescribed trails at all times in order to maintain the quality of the viewing experience while vehicles will only be used to take visitors to designated drop-off points where they start their walks and to pick-up points. On the other hand, long trails will be provided with resting sheds, benches and eco-toilets provided as specified in the Tourism Development and Management Programme. The bed capacity prescription in Buyangu Low Use, Focal Visitor Area will require only one additional 30 bed capacity ecolodge with no more visitor accommodations apart from the ongoing expansion of the Udos Bandas to increase the bed capacity from 14 to 26 and the Isukuti Guest house from 8 beds to 16 beds. The bed capacity prescription for (Isecheno Low Use, Zone Focal Visitor Area) will require an additional 16 bed eco-lodge and extension of the Isecheno guest house to 16 beds from its current 8 beds. This is an addition to the present bed capacity of 54 beds in this zone.
- ▶ The **Low Use Zone:** This zone seek to provide opportunities for exclusivity and solitude, and a wider variety of tourist activities and use options that encourage visitors to disperse, while regulating their impacts on the forest ecology. The zone is characterised by dense forest vegetation cover in the main Kakamega forest block and the disturbed Bunyala forest where plantation enterprise and livelihood improvement scheme (PELIS) is allowed. It has low visitor activities and lower density of trails thus creating less favourable conditions for game viewing. The dispersal of tourism use into this zone will be encouraged by allowing a wider variety of low impact tourist activities than the Low Use, Focal Visitor Area that will include catch and release fishing, rafting along the Yala River, birding, canopy walks and night walks along specified routes. Currently there are no visitor accommodation facilities in this zone but it is prescribed to have a public campsite at Kibiri, a 25 bed eco-lodge near Yala River Nature Reserve and a 30 bed eco-lodge in Malava Forest to encourage and extend more visitation to the zone.
- ▶ The **Wilderness Activity Zone** covers the least developed and inaccessible areas of the ecosystem. This zone is characterised by dense vegetation cover of high canopy trees and includes the Yala River Nature Reserve, Isecheno Nature Reserve, Kakamega National Reserve and Kisere Forest. This zone has mainly been designated to protect intact forest areas of natural and near natural forest cover and provide refuge for a wide variety of wildlife. Currently there are no tourism accommodation facilities and tourism support infrastructure in this area is limited. Hence to encourage dispersal of visitors across the KFE, a 25 bed eco-lodge will be permitted in Kakamega National Reserve.

## Ecological Management Programme

The Ecological Management Programme will help to ensure that critical habitat for endemic, rare, endangered, threatened and other species that demand special attention is addressed and proper measures undertaken to ensure the survival of species in these habitats. As such, this programme aims to ensure that *“The KFE ecological components, processes and services are conserved and understood, and threats to ecological integrity reduced through adaptive management”*. To achieve this, the programme uses The Nature Conservancy’s Conservation Action Planning (CAP) methodology as a mechanism for prioritizing ecological management actions in the ecosystem. This conservation and planning approach comprehensively and accurately defines the key ecological features (conservation targets) and their attributes and threats that are focus for management and identify the most appropriate management interventions to pursue to ensure the conservation of these outstanding features. The nine conservation targets identified for the KFE are:

1. Near natural forest systems
2. Riverine/riparian systems
3. Secondary forest
4. Forest glades
5. Indigenous and exotic plantation forests
6. *Prunus Africana*
7. Bush viper
8. Chapin’s Flycatcher
9. De Brazza’s monkey

Three management objectives have been designed to realise the ecological management programme. These objectives focus on enhancing the protection and conservation of species of conservation concern; sustainable habitat conservation and management and that the KFE ecological components, processes and dynamics are understood and appreciated.

## Tourism Development and Management Programme

The tourism development and management programme sets out objectives and actions that aim to *“develop a high quality, low impact tourism based on the unique biodiversity and culture that offers a memorable visitor experience”*. KFE is an island of immense biodiversity that has a high level of endemism and the only tropical rainforest in Kenya that is a remnant and eastern limit of rainforests of the Democratic Republic of Congo and West Africa that in the past stretched across the entire expanse of Central Africa and East Africa. KFE offers unique and diverse opportunities for nature based tourism for positioning in the Western Kenya Tourism Circuit. It will be made possible through an intensive marketing strategy that has been proposed in this programme. The programme has been developed closely with the zonation scheme which sets out visitor use and accommodation prescriptions. To address tourism issues in the KFE, three management objectives have been developed focusing on providing adequate administration and tourism support infrastructure, diversification of tourism activities and promoting and marketing KFE as an important tourism destination.

## Forest Resource Management Programme

The Forest Resource Management Programme sets out objectives and actions to be implemented to ensure that *“The conservation and protection of the KFE natural forest and its*

*rich biodiversity, and establish/maintain forest plantations, for sustainable use of forest resources and services in collaboration with KFE stakeholders.”* KFE is a tropical rainforest that provides a unique sanctuary for a remarkable diversity of endemic insects, reptiles, plants and birds not found anywhere else in Kenya. It is an important watershed for some of the rivers that flow into Lake Victoria. This programme has been developed to ensure that this unique forest ecosystem is conserved and sustainable utilization enhanced so that it remains invaluable to the people living around it, as a source of timber, fuel wood, herbal medicines, pasture, building materials and food. As a result, three management objectives have been developed to promote and enhance conservation and sustainable management of natural forest, maintain and enhance productivity of industrial forest plantations and increase efficiency in wood utilization, and reducing pressure on forest reserves through promotion of farm forestry.

## **Community Outreach and Education Programme**

The Community Outreach and Education Programme aims to ensure that *“the participation and support of the KFE adjacent communities in conservation, sustainable use of forest resources and socio-economic empowerment for improved livelihoods is enhanced”*. Key in achieving this aim is ensuring that KFE management and adjacent communities are able to effectively communicate and collaborate with each other, which is addressed through actions to strengthen capacity of Community Forest Associations (CFA's) and other community members in effective participatory forest management. The programme also aims to both reduce the conflict emanating from wild animals through allocation of adequate resources to the Problem Animal Control (PAC) teams and other human wildlife conflict counter measures. At the same time it aims to promote and enhance opportunities for community members to improve their livelihood through benefits accruing from ecotourism enterprises, cultural tourism and community projects. This is geared towards gaining community support for forest conservation and management. In addition, the programme aims to reduce the over reliance of the adjacent community on forest resources which has contributed to forest degradation due to over utilization. To facilitate this, therefore, four management objectives have been formulated focusing on community participation and collaboration, enhancing environmental education and sensitization programmes, minimizing human wildlife conflict, and improving community livelihoods through optimal use of available opportunities in KFE.

## **Forest Operations and Security Management Programme**

The Forest Operations and Security Management Programme focuses on the administrative functions of the KFE including the overall management of the ecosystem, policy and political issues, matters of human capital, infrastructural development, forest security, law enforcement and safety of KFE visitors and staff. The programme seeks to ensure that, *“Operational systems and structures support delivery of the KFE management programmes”*. The programme addresses a variety of issues that are vital to the efficient and effective management of the KFE. In this regard, five management objectives have been developed that focus on: strengthening institutional partnerships and collaboration, improving staff welfare, training and motivation; improving and maintaining infrastructure for efficient management of KFE; providing financial resources to support administrative and forest resource management functions; and providing adequate resources for forest security operations.

## **Plan Monitoring**

The plan monitoring section provides a framework for monitoring the potential impacts, both positive and negative, that are anticipated from the implementation of each of the five management programmes' objectives. The framework also includes easily measurable indicators for monitoring positive and negative impacts, and potential sources of this information.

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# Acronyms

AD-WCA	Assistant Director Western Conservation Area
BIC	Biodiversity Information Centre
BoT	KWS Board of Trustees
CAP	Conservation Action Planning
CFA	Community Forest Association
CPT	Core Planning Team
CWS	Community Wildlife Service (KWS)
ERV	Exceptional Resource Value
GPS	Global Positioning System
HoC	Head of Conservancy
H-BD&M	Head Business Development and Marketing
HWC	Human-Wildlife Conflict
IBA	Important Bird Area
IGA	Income Generating Activity
KEA	Key Ecological Attribute (of conservation target)
KEEP	Kakamega Environmental Education Programme
KFE	Kakamega Forest Ecosystem
KFS	Kenya Forest Service
KFS H-B	KFS Head of Biodiversity
KNR	Kakamega National Reserve
KTB	Kenya Tourism Board
KWS	Kenya Wildlife Service
MoA	Ministry of Agriculture
MoL	Ministry of Livestock
MoT	Ministry of Tourism
MMUST	Masinde Muliro University of Science and Technology
IUCN	International Union for Conservation of Nature
NEMA	National Environment Management Authority
NMK	National Museums of Kenya
PA	Protected Area
PAC	Problem Animal Control
PAPF	KWS Protected Areas Planning Framework
PELIS	Plantation Establishment and Livelihood Improvement Scheme
SRS	Senior Research Scientist
TNC	The Nature Conservancy
ZM	Zonal Manager

# Plan Foundations

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## The Plan

The Kakamega Forest Ecosystem Management Plan (2010-2020) is an integrated plan developed through the collaboration of KWS and KFS, which lays out the desired conditions of the forest environment—both natural and cultural, and provides a framework for management to deliver the desired conditions. It should be understood that natural resource management and cultural resource management are interdependent. Cultural resources comprise an extensive range of values and uses which include tree preservation, public access, recreation, animal welfare, aesthetic and spiritual values, and education, among others. The goal of this plan is to provide ways for the two management units along with diverse stakeholders, to execute their function of stewarding the Kakamega forest and associated forest blocks, which are important water catchments for Lake Victoria. As a result, the plan has adopted an integrated management approach that recognizes the necessity of holistic planning. Additionally, the planning process adopted a participatory approach to ensure that stakeholder interests are addressed.

The need to prepare this management plan for the KFE has been prompted by the many threats to the forest ecosystem as well as serious or irreversible environmental damage emanating from human activities. There is an imperative requirement for the conservation and management of the Kakamega forest due to its richness in biological diversity and the great national and international interest in the zone. The forest cover has declined from 24,798 ha in 1933 during its gazettement, to 11,848 ha in 2004, mainly due to illegal activities such as logging and charcoal burning as well as pressure from the surrounding communities who depend on it for their livelihood.

Some of the human activities which have posed serious threats to the survival of the forest ecosystem include the following: population increase in the neighbouring community leading to encroachment of forest boundaries; overgrazing; charcoal burning; inadequate resources to manage the forest; poor infrastructure; limited community participation; over-exploitation of valuable species; invasive species and deforestation. This has presented a challenge on the establishment of a balance between sustainable forest resource utilization and the implementation and management of a sustainable future for the KFE, its habitats, neighbouring communities and wildlife habitats. For this reason, the development of this management plan came to existence, to address the above challenges and prevent further degradation of the forest ecosystem.

The plan is designed as a practical management tool supporting KFE management in executing their duties. In order to achieve this function, the plan sets out strategic guidance on the goals (the purpose statements) towards which management is scheduled to work on for the next 10 years, as well as a series of prescriptions and management actions that need to be implemented.

The plan is supported by the two management units planning frameworks (Protected Area Planning Framework for KWS and Participatory Forest Management approach for KFS), and ensures ease of implementation and response to the key issues impacting on the area, as well as the provision of guidance and support that KFE managers require.

## Plan structure

The plan structure has been simplified to create ease of understanding and facilitate efficient plan implementation by the protected area managers. Table 1 below is an outline of the plan.

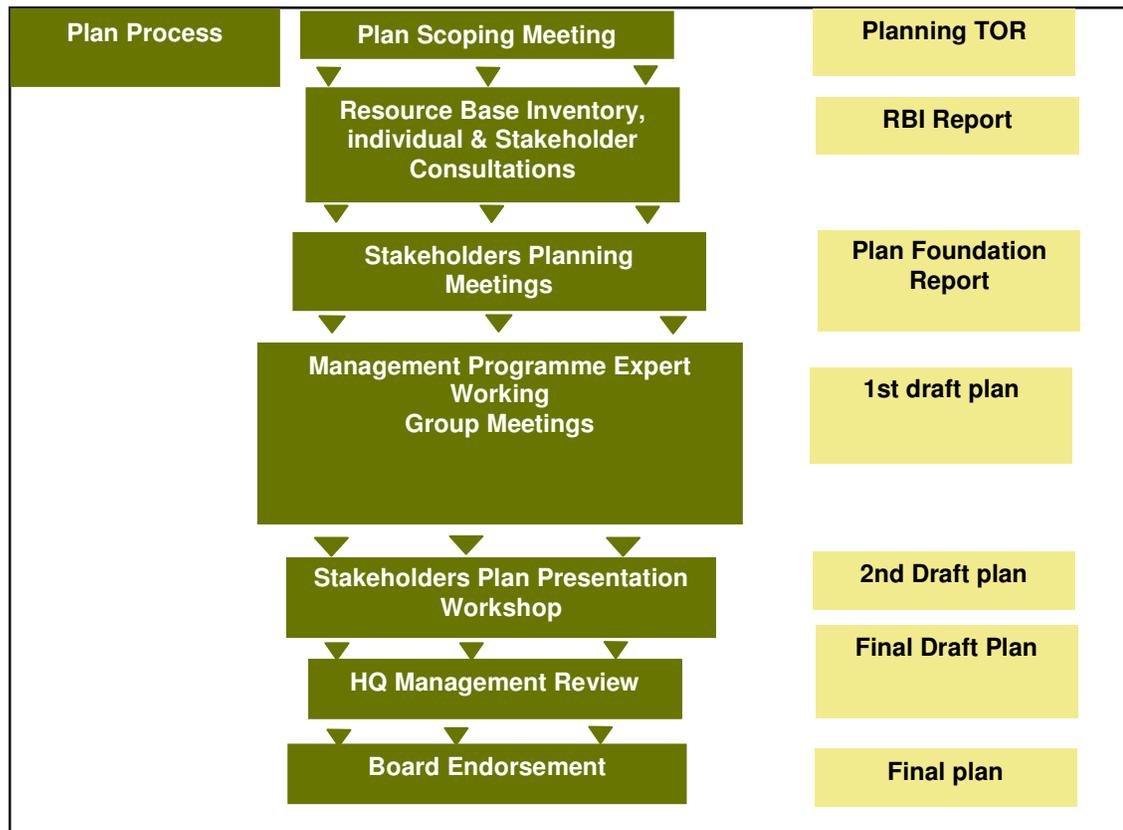
**Table 1. Plan structure, functions and contents**

Chapter	Function and contents
Plan Foundations	<ul style="list-style-type: none"> <li>▶ Provides an introduction to the KFE and its management</li> <li>▶ Introduces the plan, describes the plan structure and the planning</li> <li>▶ Sets out the KFE's Purpose Statement, and exceptional resource values</li> </ul>
Zonation and Visitor Use Scheme	<ul style="list-style-type: none"> <li>▶ Provides a mechanism to enable the spatial management of visitor use and protection of ecological sensitive areas within the KFE</li> <li>▶ Sets out areas of the KFE where different types of visitor use and tourism developments are permitted</li> <li>▶ Provides specific prescriptions on resource utilization by the communities</li> <li>▶ Ensure that the management extends its mandate by increasing management presence and infrastructure development across the entire ecosystem.</li> </ul>
Management Programmes	<ul style="list-style-type: none"> <li>▶ This constitutes the bulk of the management plan and provides a management designed framework to achieve the future desired state of the KFE. The five KFE Management programmes are:                             <ul style="list-style-type: none"> <li>○ <b>Ecological Management Programme</b></li> <li>○ <b>Forest Resource Management Programme</b></li> <li>○ <b>Tourism Development and Management Programme</b></li> <li>○ <b>Community Outreach and Education Programme</b></li> <li>○ <b>Forest Operations and Security Programme</b></li> </ul> </li> <li>▶ Each programme includes a programme purpose statement and guiding principles that define what the programme overall goal aims to achieve and the principles underlying the process</li> <li>▶ Contains management objectives that sets out the future desired state that KFE management aims to achieve</li> <li>▶ Provides a set of specific management actions that management will implement to achieve the management objectives</li> </ul>
3-Year Activity Plans	<ul style="list-style-type: none"> <li>▶ Provides the link between the 10-year management actions and the annual work plan and budgeting process at KFE</li> <li>▶ Breaks down a programme's management actions into a series of tangible and explicit activities</li> <li>▶ Sets out the timeframe for activity implementation, allocates responsibility for completion, and "milestones" for monitoring plan delivery</li> </ul>
Plan Monitoring	<ul style="list-style-type: none"> <li>▶ Provides a framework for the assessment of positive and potentially negative impacts of plan implementation</li> <li>▶ Includes easily measurable and quantifiable indicators for assessing impacts, and potential sources of the information required</li> </ul>

## The Planning process

The development of the KFE management plan has largely borrowed from the Protected Area Planning Framework (PAPF) methodology incorporating the Participatory Forest Management (PFM) process to a certain extent. The two planning methodologies promote the inclusion of a wider cross section of stakeholders involved in the management activities of the KFE. Box 1 below shows the planning process followed in the development of the KFE Management Plan

**Box 1: The KFE planning activities and their outputs**



**Plan scoping meeting:** - The plan scoping meeting drew participation from CPT members (KWS & KFS). Through the meeting the following items were developed: Terms of Reference (ToR) for development of the management plan; identification and description of plan geographic scope; management issues, problems and opportunities; management programmes needed to address these issues; stakeholders who should be involved in the management plan development; information needed for planning; responsibility for information collection and planning timeframe and budget.

**Resource Base Inventory and individual Stakeholder Consultations:** - This planning step involved gathering information needed to inform the planning process. This information was used in developing data supported management programmes.

**Stakeholders Planning Meetings:** - This was meant to give stakeholders an opportunity to participate in the planning process. The stakeholders reviewed the plan scope of work, including pertinent issues and opportunities. In addition, they identified Exceptional Resource Values and developed the ecosystem’s purpose statement.

**Management Programme Expert Working Group Meetings:** - Experts in various management schemes developed specific management programmes, purposes, objectives and actions to be implemented in the duration designated in the plan.

**Stakeholders’ Plan Presentation Workshop:** - This workshop provided an opportunity for external stakeholders to review, comment on, and endorse the contents of the draft management plan.

**HQ Management Review:** - The 2<sup>nd</sup> draft plan incorporating stakeholder input was presented to the Executive Management Committees of KWS and KFS for endorsement.

**Board Review:** - The plan was forwarded to the respective Management Boards for approval.

## The Kakamega Forest Ecosystem

### Area description

Kakamega forest is recognized as the eastern-most relic of the Guineo-Congolian lowland rainforest belt, which once stretched from Kenya across Uganda, East and Central Africa to the West African coast. Situated in Western Kenya, 35 km from Lake Victoria, Kakamega Forest is an exclusive sanctuary for an extraordinary variety of endemic flora and fauna, including insects, reptiles and birds which are not found in other parts of the country. An estimated 10 - 20% of the animal species in the forest are unique to this forest. It is also an important watershed for some of the rivers that flow into Lake Victoria. The forest is very useful to the people living around it, as a source of timber, fuel wood, herbal medicines, building materials, food and land for farming.

The first demarcation of the forest boundary was carried out around 1908-10, when the forest was managed under the Local Native Council. The discovery of gold in the district led to the Kakamega gold rush of the early 1930s, thus many parts of the forest were opened up to gold prospectors. With the rapid increase in the need for pit-props, fuel wood and timber, the first exploitation of the forest for timber took place.

The forest covers about 230 km<sup>2</sup>, and less than half of this area currently remains as indigenous forest. There are numerous grassy clearings and glades. Large mammals are rare in the forest, but the extensive variety of birds, reptiles and insects make it a specialist eco-tourism attraction for bird watchers and wildlife photographers. Part of the forest also contains unique and rich highland ecosystems, but generally the fauna and flora of the Forest have not been studied comprehensively. The forest experiences a very wet climate, with over two meters of rain annually. The rainy seasons are April-to-May and August-to-September.

### KFE components

KFE comprises one national reserve (Kakamega forest), three forest reserves (Kisere, Kakamega, Malava and Bunyala) and two nature reserves (Isecheno and Yala).

**Kakamega Forest Reserve** is situated approximately 1.6 - 22.4 km east of Kakamega town. The forest was declared a forest area by Proclamation No. 14 of 13<sup>th</sup> February 1933 which set aside 23,777.3 hectares as Kakamega Forest, along with Malava Forest block. Currently it covers an area of about 19,792.4 hectares in size after several excisions over time and creation of Kakamega National Reserve

**Malava Forest Reserve** was established through Proclamation No.14, of Feb 13th, 1933. It was declared a forest reserve with an area of 718.8 Ha.

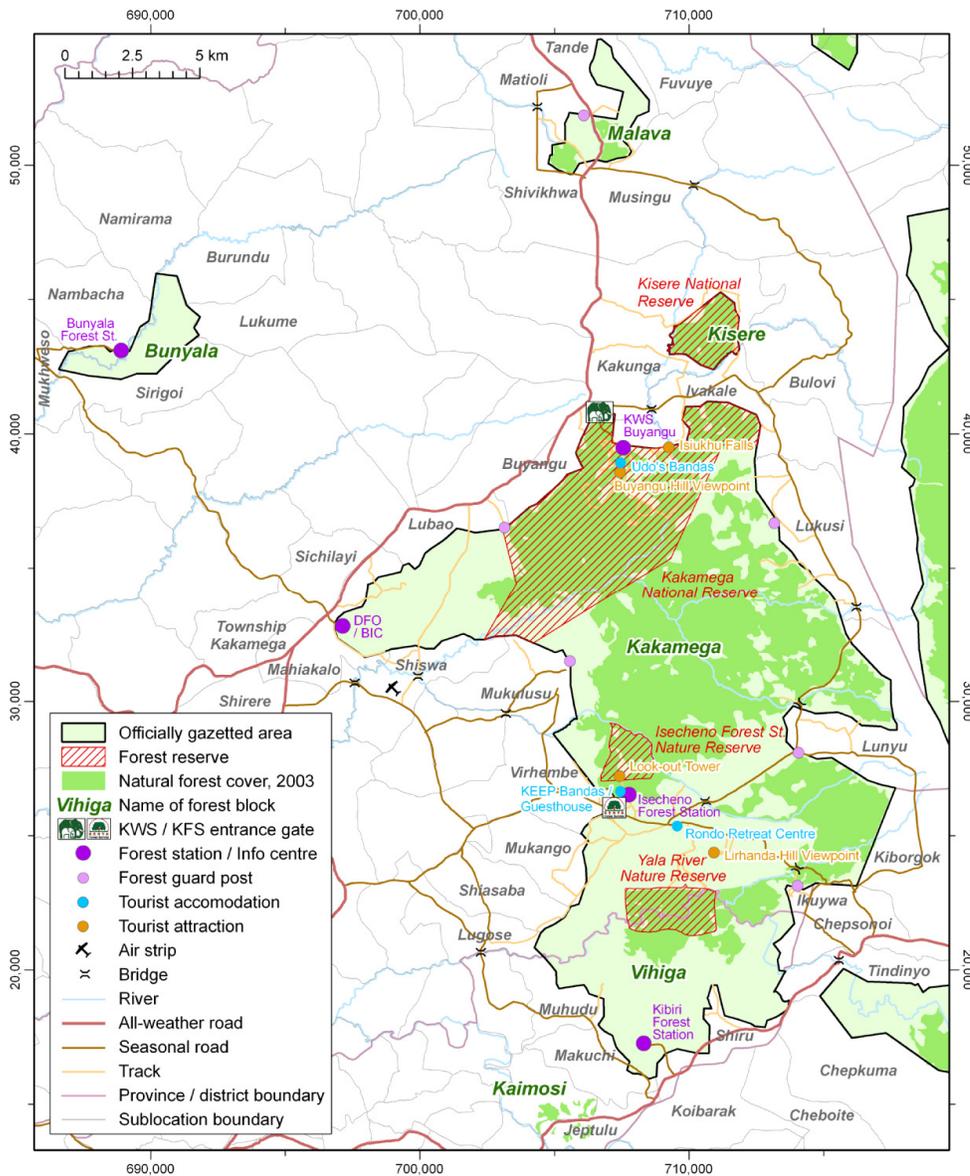
**Isecheno Forest Station Nature Reserve** lies within the Kakamega Forest and is located in the western portion of the forest. It was declared a Forest Nature Reserve via Boundary Plan

number 180/40-42 and is estimated to cover an area of 138 hectares.

**Yala River Nature Reserve** lies within the Kakamega Forest Reserve and situated in the southern portion of the Kakamega Forest, covering an area of approximately 538 hectares. It was declared a Forest Nature Reserve via Boundary Plan number 180/40-42.

**Bunyala forest** has an area of **826.6 Ha** and gazetted under proclamation No. 421 of 1956 and is managed by KFS. Figure 1 below shows the KFE geographic extent and its components.

**Figure 1. Geographic extent of Kakamega Forest Ecosystem**



## KFE Exceptional Resource Values

The KFE Exceptional Resource Values (ERVs) describe the area’s key natural resources and other features that provide outstanding benefits to local, national and international stakeholders and that are especially important for maintaining the area’s unique qualities, characteristics and ecology. The following sections describe the KFE ERVs as identified by stakeholders during the planning process. These ERVs are in four categories: Biodiversity, Scenic, Social and Cultural (See Table 2 below).

**Table 2. KFE Exceptional Resource Values**

Category	Exceptional Resource Value
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>▶ Important Bird Area (IBA)</li> <li>▶ Diverse primates (De Brazza’s monkey, Blue monkey, black and White Colobus and Red-tailed Monkey)</li> <li>▶ High insect diversity</li> <li>▶ Endemic snakes (Kaimosi blind snake, Gabon viper)</li> <li>▶ Rich diversity of tree species</li> <li>▶ A remnant of Guinea-congolean Equatorial forest</li> </ul>
<b>Scenic</b>	<ul style="list-style-type: none"> <li>▶ Beautiful panoramic view points - Liranda, Mahiakalu and Buyangu hills</li> <li>▶ Isiukhu and Yala River</li> <li>▶ Natural glades</li> <li>▶ Kakamega Forest canopy</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>▶ Source of livelihood - fodder for cattle, grass, sericulture (wild silk) harvesting medicinal plants, Wild vegetables –mushroom, and tree nursery establishment, domestication and commercialization of <i>Mondia</i> and <i>Osmum spp</i>, Ecotourism tour guiding, Bandas, bird watching bee keeping, butterfly farming, snake farming</li> <li>▶ Good micro climate - high rainfall, watershed for lake Victoria basin</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>▶ Tiriki cultural sites (circumcision)</li> <li>▶ Community cultural activities - bull fighting, Dog market at Lubau, cock fighting, traditional dances, pottery at Ilesi and Mukhonje</li> </ul>

## Biodiversity values

### Important Bird Area (IBA)

Kakamega forest is designated as an Important Bird Area. These are regions that host large numbers of bird species. Out of the 1,065 bird species found in Kenya, it has been confirmed that 472 are found in Kakamega Forest. The Kakamega Forest hosts the Turner’s Eremomela (*Eremomela turneri*) and Chapin’s Flycatcher (*Muscicapa lendu*) which are listed as globally threatened species, in addition to 15 species regionally threatened, and 46 unique species recognized in Kenya only from this Forest. Bird species, and in particular forest specialists, are threatened by habitat destruction and forest fragmentation. Many bird species are crucial for the forest ecosystem, because most tree species depend on birds for seed dispersal. In this regard, the Black-and-white-casqued Hornbill (*Bycanistes subcylindricus*) is an important species for seed dispersal in Kakamega Forest.

Another important ecosystem function of birds is insect predation and 56 bird species have been observed attending the swarm raids of the army ants *Dorylus wilverthi* and *D. (Anomma) molestus* in the forests of the Kakamega area. These 'ant-followers' pursue the ant raids to feed on insects flushed by the ants. Five of these birds are specialized ant-followers, and the following is a sample of bird species in decreasing order of specialization: White-tailed Ant Thrush (*Neocossyphus poensis*), Brown-chested Alethe (*Alethe poliocephala*), Red-tailed Bristlebill (*Bleda syndactyla*), Grey-winged Robin (*Sheppardia polioptera*), and the Equatorial Akalat (*Sheppardia aequatorialis*).

### **Diversity of primates**

Kakamega forest is the habitat to five out of the eight primate species found in Kenya. Monkeys are the most conspicuous group of mammals in the forest, with the Blue Monkey (*Cercopithecus mitis stuhlmanni*), the Redtail Monkey (*Cercopithecus ascanius schmidtii*), and the Black-and-White Colobus Monkey (*Colobus guereza*) as the most common species. Aside from their important role in the ecosystem as seed dispersers, they have significant ecotourism value, since they are well habituated in some areas, especially Isecheno, as a result of long-term scientific studies.

Despite the prevalence of the Pottos (*Perodicticus potto ibeanus*) in the forest they are nocturnal and much harder to detect. In contrast, baboons (*Papio cynocephalus anubis*) are well known as pests in the lands adjacent to the forest, particularly in the north of the forest and Kisere Forest. The De Brazza's Monkey (*Cercopithecus neglectus*) is rare in Kenya and is confined to the riverine vegetation of Kisere Forest. However, this small population of about 25-50 animals, appears to be one of the largest in the country.

### **High insect diversity**

KFE is endowed with a high diversity of insects. Butterflies are represented by 487 species which constitute 54% of the 900 species known to Kenya. Moths are also common species in this area, with recorded totals of 53 Hawk moths (Sphingidae), 37 Emperor Moths (Saturniidae), and 43 Tiger Moth species (Arctiinae).

A total of 72 dragonfly species, representing 42% of Kenya's dragonfly fauna, has been recorded in the Kakamega forest. Twenty species are of national importance in Kenya, since they are only found at this site within the country. At the global level, *Orychogomphus styx* and *Chlorocnemis pauli* are classified as 'Near Threatened', although most species are listed as 'Least Concern'. As terrestrial and aquatic top predators, dragonflies play an essential role in food webs and consequently they are beneficial to the entire ecosystem. The species found only in Kakamega are particularly considered to be good indicators of habitat quality.

Kakamega forest has also recorded a total of 170 ant species, with estimated species numbers lying between 200 and 250. Several ant species which have been described as new to science were first collected in Kakamega Forest, particularly those in the genus *Axinidris*. It is very likely that Kakamega Forest holds more species than any other locality in Kenya and nationally the ant fauna of this forest is unique as most of the dominating species in the forest are of Guineo-Congolian origin.

Termites are among the most important groups of invertebrate decomposers and have enormous impact on soil properties and nutrient cycling. However, most termite taxa are poorly understood and the relationship between termite diversity and ecosystem services is not well known. Research suggests that, of the 62 termite species described in Kenya, 25 species have so far been found in Kakamega Forest.

To date there are 243 species of bees found in Kakamega Forest. Pollinators exert direct effects on plant demography, population genetics, and plant community composition, and they influence indirect effects on all higher trophic level organisms that exploit plants for food or shelter.

### **Endemic snakes**

Kakamega Forest and the surrounding areas are recognized as national hot spots of biodiversity, known to host some of the most unique snake species. To date, 36 snake species have been recorded. A majority of these snakes originate from West Africa including the Forest Cobra, the Black-lipped Cobra, Jameson's Mamba, the Bush Viper, the Rhinoceros-horned Viper and the Gabon Viper. The Gold's Cobra and Kaimosi Blind Snake are prevalent in the Kakamega forest, but are believed to be in danger of extinction. Species characteristic of West African forests and reaching their eastern limit in Kakamega or the Nandi Forests are, the Gold's Tree Cobra (*Pseudohaje goldii*) and the Forest Night Adder (*Causus lichtensteini*).

### **Rich diversity of Vegetation and plant communities**

The uniqueness of the Kakamega Forest lies in its rich diversity in plant species, which are not found elsewhere in Kenya. It is home to the Elgon teak and *Prunus africana*, which are species of special conservation concern (locally threatened and rare). These species are prone to over exploitation due to their high quality timber and medicinal value. In addition, scientific research has indicated the presence of 13 different plant communities, each representing a different succession stage. A large area of Kakamega Forest consists of middle-aged secondary forest but much of the Buyangu area and the north-eastern part of the forest are characterised by very young secondary forest.

## **Scenic values**

### **Beautiful panoramic view points**

Buyangu hill is a rocky hill which was previously a quarry mining site. At the top of the hill is a look-out tower that allows a spectacular view of the northern part of Kakamega forest. Buyangu hill can be accessed via Buyangu hill trail (which covers 700 metres) and has a wide view of the Kakamega forest, mainly to the south, the glades and also the Lirhanda hill. Lirhanda hill is another beautiful feature of the KFE which is found in the north of Yala River. It is the highest point in Kakamega Forest; hence it provides an excellent panorama of the forest and surrounding countryside. In the 1920s, the prospects for gold led to several mining activities, and some of the shafts and pits are still recognisable, as well as a rocky ramp at the foot of the hill. On the northern slope, there is a gallery which is inhabited by numerous cave-dwelling species like cave crickets and bats such as the Mountain Fruit Bat (*Rousettus lanosus*), Egyptian Fruit Bat (*Rousettus aegyptiacus*) and the Brown House Bat (*Scotophilus spp*).

### **Isiukhu and Yala River**

Isiukhu River offers beautiful view points for birds as one walks along the Isiukhu nature trail of 12.8 km. Along the trail, natural glades, secondary vegetation, old secondary forests and the Isiukhu falls can be observed. There is a picnic site where visitors can relax as they view the waterfall. The river hosts the Long-tailed Cormorants (*Phalacrocorax africanus*), African Broadbill, Jameson's Wattle-eye (*Platysteira jamesoni*), Chestnut Wattle-eye (*Dyaphorophya castanea*), antelopes of different kinds such as Bushbuck (*Tragelaphus scriptus*) and the Blue Duiker (*Philantomba monticola*), vipers, Blue Monkey (*Cercopithecus mitis*), Red-tailed

Monkey (*Cercopithecus cephus ascanius*), Colobus Monkey (*Colobus guereza*), Blue-headed Bee-eater (*Merops muelleri*), Hammerkop (*Scopus umbretta*) and freshwater crabs.

The Yala River is in the south-eastern end of the forest and has a spectacular waterfall which is about 20 metres high. The trail towards the river and falls offers visitors the opportunity to view typical primary and old secondary forest with a composition of monkeys, various bird species and several snake species like the Rhinoceros Viper (*Bitis nasicornis*) and the Gaboon Viper (*Bitis gabonica*).

### **Natural Glades**

There are several natural glades within KFE that provide a brilliant and interesting contrast to the forest. The glades are usually comprised of small trees; *Combretum molle*, *Psidium guajava*, *Maesa lanceolata*, *Harungana madagascariensis* and *Chaetacme aristata*. They range in size from approximately 1 to 50 ha, with a having few larger clearings. The origins of the glades are uncertain though some are certainly recent clearings, while others pre-date recent records. These may have originated from past human activity such as cattle grazing, or may be the result of herbivory and movements by large mammals such as buffaloes and elephants (both are currently extirpated from the region).

### **Kakamega Forest Canopy**

The high canopy forest has a high floral diversity with dominant tree species comprising of *Croton megalocarpus*, *Albizia gummifera*, *Bosquiea phoberos*, *Anningeria altissima*, *Antiaris toxicaria* and *Fantumia elastica*. When observed from a higher point like Buyangu and Lirhanda hills, they appear as a striking green and beautiful landscape with remarkable forest structures and gaps in the forest canopy, which allow for succession and the maintenance of species diversity.

## **Social values**

### **KFE Forests as a source of community livelihood**

The area around Kakamega forest is one of the most densely populated rural areas in Kenya. There are 57 village communities whose land border Kakamega Forest. However, rapid population growth in the adjacent communities has increasingly exerted pressure on the forest and its resources. These communities are the prime local users of the forest products/resources, thus the KFE is a vital source of support to the locals. 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. Some community groups exploit the forest as an alternative source of income through ecotourism, bee keeping and production of tree seedlings for sale. Additionally, some farmers have domesticated the *Mondia whitei* and *Osmum spp* for commercial farming.

KFE has the potential to supply timber and pole wood needed by the timber industry at the local and national level, through industrial plantation and cultivation. Despite the presence of a ban in the commercial exploitation of timber, KFE stands a high chance of contributing to the national economy once the ban on logging is lifted and clear guidelines put in place to prevent unsustainable utilization. In addition to the forest's significance in the timber industry, it generates substantial economic benefits through visitor entrance fees. Nevertheless, visitation is low but it is expected to improve in the near future, especially with the implementation of this management plan.

## Cultural values

### The Luhya Culture

The Luhya community has a very rich and distinct culture. However, traditional societies and cultures are increasingly coming under threat in Kenya, and in many cases cultural norms are breaking down as younger generations migrate to urban areas in pursuit of better opportunities to sustain themselves and their families. The management seeks to nurture this rich culture through establishment of cultural centres and gazettement of some of the unique features and events of the Luhya community. In addition, the forest acts as a significant location for traditional ceremonies and worship. There are sacred sites within the forest which include: Ikavakava shrine, used for cleansing community offenders by selected traditional healers and Tiriki sacred forests, which are forest patches mainly used as circumcision sites by the Tiriki sub-tribe of the Luhya community. Some of the notable cultural events include; bull fighting, cock fighting and traditional dances. Further, the people of Ilesi and Mukhonje maintain their livelihoods through pottery till present day. Lubao town hosts dog sellers every week, making it a unique market in the region.



# KFE Zonation Scheme

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## Introduction

The Kakamega Forest Ecosystem (KFE) zoning scheme aims to provide a framework for reconciling management needs of **conserving natural resources, promoting sustainable use of forest resources** and **regulating and promoting visitor use**. The scheme identifies areas where similar types and levels of use and management emphasis are appropriate, and will enable the extent and type of visitor use to be managed spatially. The KFE Zonation scheme provides for management sectors, visitor use and forest resource use. It has been divided into seven forest resource use zones, five management sectors and three visitor use zones. The five management sectors and their corresponding visitor use zones are discussed in the following sections.

## KFE management sectors

The aim of the Management Sector is to ensure that the management extends its mandate by increasing management presence across the entire ecosystem. As illustrated in figure 1, Kakamega Forest Ecosystem is divided into the following management sectors:

- Kakamega Forest Reserve - This is the main block in Kakamega District managed by KFS Kakamega Forest Station. It is comprised of two nature reserves, the Yala River Nature Reserve and Isecheno Nature Reserve;
- Kakamega Forest National Reserve managed by KWS Buyangu Office;
- Kisere forest which is part of Kakamega Forest National Reserve
- Malava Forest Reserve; and
- Bunyala Forest Reserve.

The KFE management zones are based on the existing forest blocks but in consideration of how they are administered. Table 3 shows these management sectors and their administrative centres including other management facilities such as ranger outposts and gates, while Figure 2 shows a map of the different forest blocks making up the KFE. For effective policing and administration, eight outposts have been proposed for different forest blocks.

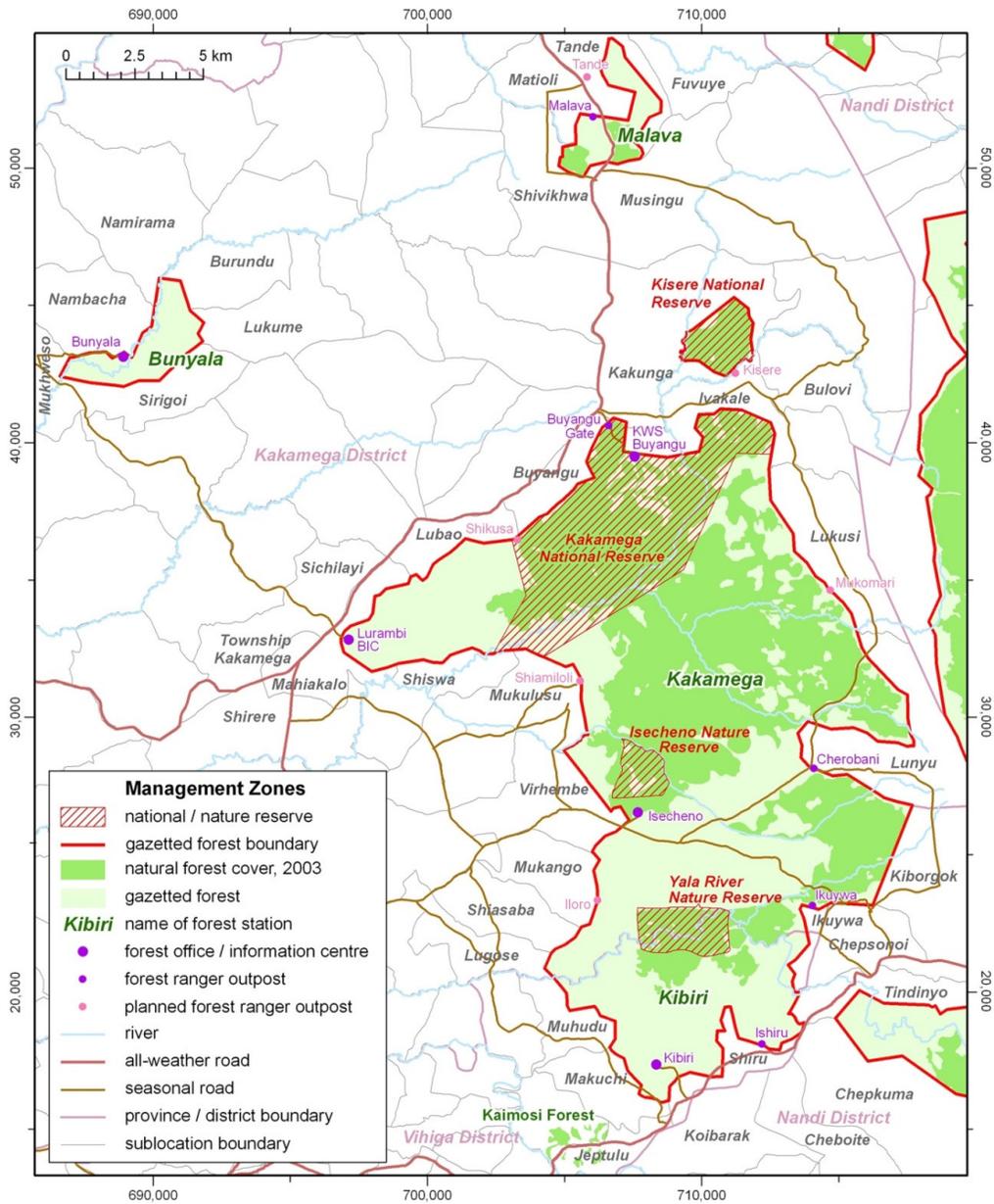
**Table 3. KFE Management Sectors and Administration Centres**

Management Sector	Management Unit	Managing Authority & Hqs	Existing Forest Ranger Outposts	Proposed outposts
Kakamega Forest Reserve	Kakamega Forest Station	KFS/ Kakamega Forest Station	<ul style="list-style-type: none"> <li>• Ikuywa, Cherobani/Mukomari, Shikusa, Lurambi, Shamiloli &amp; Isecheno</li> <li>– All these outposts exist but only Ikuywa, Cherobani, Lurambi and Isecheno are manned.</li> </ul>	<ul style="list-style-type: none"> <li>• Proposed new outpost: Iloro</li> </ul>

## ZONATION SCHEME

Management Sector	Management Unit	Managing Authority & Hqs	Existing Forest Ranger Outposts	Proposed outposts
			<ul style="list-style-type: none"> <li>- The rest are not manned due to lack of personnel.</li> <li>- All outposts should be manned to ensure effective policing and reduce pressure</li> </ul>	
	<b>Isecheno Nature Reserve</b> - Kakamega Forest Station	KFS – Kakamega Forest Station	Forest HQs	
	<b>Yala River Nature Reserve</b> In both Kakamega forest Station and Kibiri Forest Station	KFS – Kibiri and Kakamega Stations	None	
Kakamega Forest Reserve - Kibiri	Kibiri Forest Station	KFS/ Kibiri	Ishiru Kibiri	<ul style="list-style-type: none"> <li>• Muyere</li> <li>• Musunji</li> <li>• Kaptis</li> </ul>
Kakamega National Reserve	Buyangu Station	KWS/Buyangu	Buyangu Buyangu gate	<ul style="list-style-type: none"> <li>• Shihingu</li> <li>• Shanderema (proposed due to pressure and distance from Buyangu)</li> </ul>
	Kisere Forest	KWS/Buyangu	No ranger outpost	<ul style="list-style-type: none"> <li>• Proposed outpost at Kisere</li> <li>- Kisere forest is an important habitat for the rare De Brazza's monkey with about 30 individuals remaining</li> <li>- Kisere forest is experiencing high pressure from the adjacent community</li> <li>- Kisere is ideal for research work</li> <li>- Buyangu station is a bit far therefore the need for an outpost.</li> </ul>
Malava Forest Reserve	Malava Forest station	KFS/Malava	Malava	<ul style="list-style-type: none"> <li>• Tande outpost</li> <li>- Due to grazing and firewood collection pressure</li> </ul>
Bunyala Forest Reserve	Bunyala Forest Station	KFS/Bunyala	Bunyala	

Figure 2. KFE Management Sectors



# Forest Resource Use Zones

The Forest Resource Use Zonation is aimed at reconciling the principal purpose of protecting the Kakamega forest ecosystem and other resource values with limited use by local communities and visitors. It will also ensure the protection of key forest habitats and other forest resources, and allow the restoration of damaged areas to facilitate recovery. It will assist in protection of the forest, its biodiversity and ecological services (water catchment), in addition to ensuring sustainable livelihoods for local people. This will be made possible through provision of the ultimate coverage of the main body of Kakamega Forest with continuous indigenous forest, while maintaining historic glades for diversity; utilising the forest with separate areas allocated for local community use and continued commercial logging activities; and excluding cattle from the core forest and areas of high protection. As a result, the forest zoning scheme divides forests in the KFE into four Resource Use Zones: Protection Zone, Core Forest Zone, Potential Utilization Zone and Livelihood Support Zone. Brief descriptions of these zones are given in the following sections, while Figure 3 shows the Forest Resource Use Zonation.

## Protection Zone

The protection zone covers the areas with high protection status. It is comprised of forest areas that are already under KFS or KWS management, including the Kakamega National Reserve, Kisere Forest, Isecheno and Yala River Nature Reserves. The zone is characterized by natural forest with low historical disturbance and access difficulty. The area not only forms a good representation of local forest types, but it is very ideal for research work as well, and acts as a safe haven for species undisturbed by human activity.

## Core Forest Zone

The aim of this zone is to provide a large natural forest zone for protection of vegetation and wildlife, to safeguard Yala Nature Reserve with a non-extraction indigenous forest, and to create a single block of forest in Malava Forest. This zone also covers areas where permanent corridors have been planned for to enhance forest connectivity. This includes the strategic corridor between the two forest blocks at Ikuywa, which currently experiences heavy degradation due to its proximity to a densely populated area. Management intervention measures will include efforts to restore a substantial forest corridor between Yala and Ikuywa forests to facilitate its inclusion in the Core Forest Zone. The rehabilitation effort will strictly focus on indigenous forests.

## Potential Utilization Zones

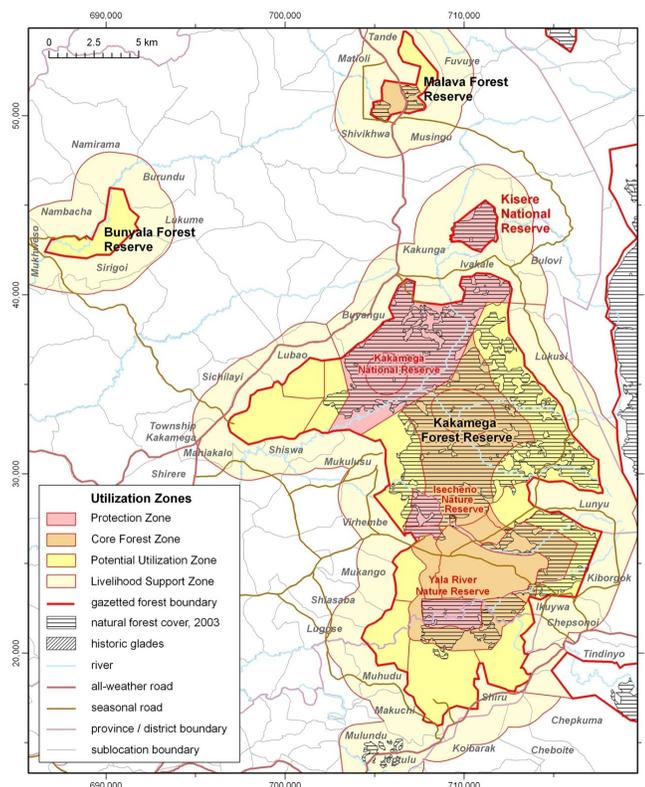
These are strategic forest areas adjacent to local communities and serve as a buffer to the forest reserves. These areas are indicators of intense human interruption over the past till present day. In some areas they are dominated by traditional grazing land and bushland. Most of these areas are currently not utilized for industrial plantation but the Bunyala sector is establishing plantations through the Plantation Establishment and Livelihood Intervention

Scheme (PELIS). The fundamental purpose of this zone is to enhance sustainable utilization of forest resources and contribute to local community livelihoods, while protecting the rest of the forest ecosystem and restoring degraded forest patches. Some areas in this zone will also promote the protection of corridors and provide grazing areas with minimal forest interference. This zone includes the Bunyala Forest, some sections of the Malava Forest (see figure 3), Shiamiloli, north-east of the main Kakamega Forest block dominated by traditional grazing land and bushland, the current grassland area next to Shiasaba and Lugose communities, and the 'Nandi link' (a strategic location within Kakamega Forest but adjacent to the possible restoration of the forest link to the South Nandi Forest). The promotion of KFS income via possible monocultures and exotics is provided under the zone in Bunyala, Malava and Kibiri Forests where plantations are being established through PELIS.

## Livelihood Support Zone

This zone comprises of community land located 2 Kms from the forest boundary, but the buffer shall be extended up to five kilometers depending on needs as may be deemed necessary by the management. This is the area targeted for sustainable livelihood support programs to reduce pressure on the forest. The communities in this zone are the main consumers of the forest resources, thus leading to intense forest degradation. Interventions in this zone will therefore focus on activities that reduce illegal harvesting of the forest resources, improving KWS/KFS-community relations and protecting biodiversity. Given that the zone is located on private land, KFE management will create awareness on the importance of the forests and biodiversity conservation, in addition to assisting the community in identifying alternative income sources and implementing livelihood support projects.

**Figure 3. Forest Resource Use Zones**

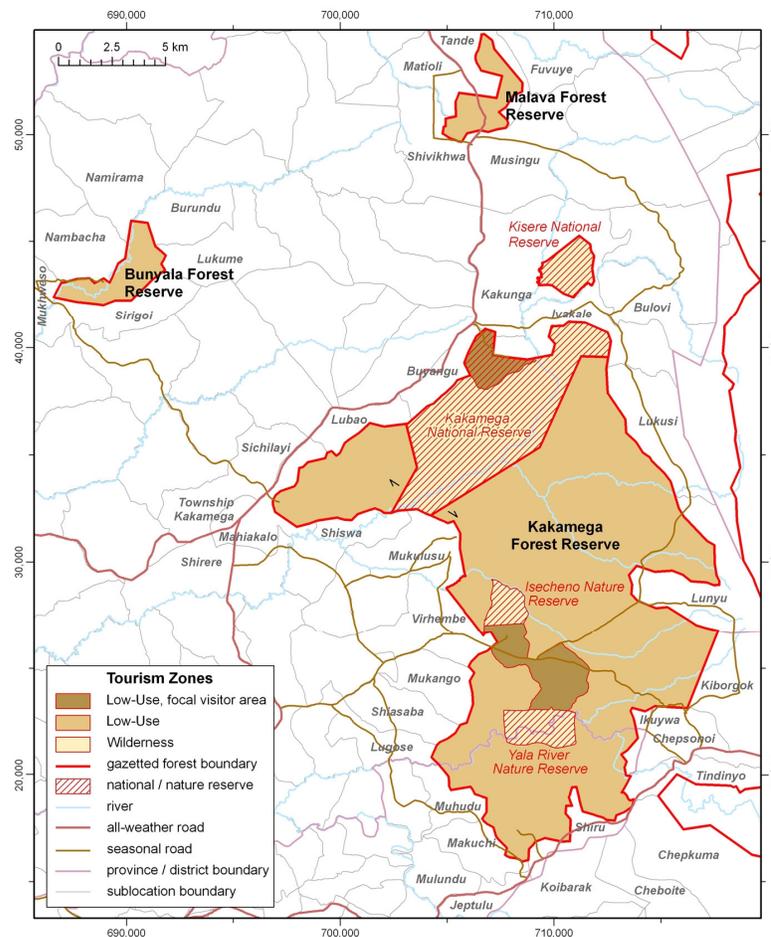


# Visitor Use Zones

KFE is generally a low visitation area, with minimal visitor impact to the ecosystem. This zonation scheme along with the Tourism Development and Management Programme aims at ensuring the efficient distribution of visitors across KFE, and that highly visited areas have appropriate regulations and restrictions for sustainable use. The visitor use zones will facilitate the level and type of visitor use to be administered across the forest ecosystem by identifying areas where similar types and levels of use and management emphasis are appropriate. The purpose of these visitor use zones will be dependent on the issues influencing KFE, and the stakeholder-agreed desired future state of the area.

To enable spatial distribution and regulation of visitors across the ecosystem, KFE has been divided into three key visitor use zones designated as Low Use-Focal Visitor Area, Low Use, and Wilderness Zones. Whenever possible, these zones have been aligned to existing physical features for ease of identification by KFE managers. Figure 4 shows visitor use zonation.

**Figure 4. KFE Visitor use Zones**



## Low Use-Focal Visitor Area Zone

The Low Use-Focal Visitor Area covers approximately 1385.6 hectares representing 5.36% of the KFE. It encompasses the northern Kakamega National Reserve and Isecheno section of the Kakamega Forest Reserve. The zone contains permanent tourism accommodation facilities and has an extensive network of nature trails and game-viewing roads. A large number of primates and birds are found in this zone, making it the most desired tourism area.

### Isecheno Low Use, Focal Visitor Area

The Isecheno Low Use Focal Visitor Area covers around 964.7 km<sup>2</sup>, which represents 3.73 % of KFE. This area is characterized by high primate and bird densities, thus a focal point for researchers. The Isecheno KFS headquarters, Rondo Retreat Centre, KEEP Bandas, Isecheno Guest house and the KEEP Education Centre are located in this area, thereby drawing an extensive array of visitors.

#### Zone details

The boundary of the Isecheno Low Use-Focal Visitor Area extends from the main road at the barrier before the junction to Willy River, then to Rondo River extending to the boundary of Yala River Nature Reserve, up to the North at the small Sesimo River, and further extends to Lirhandu Hill. Additionally, the zone follows the old trail originally used for access to Lirhandu Hill, and stretches to the ICRAF research plot, extending further to the road that leads to Cherobani back to Kisaina junction. From Kisaina junction, it extends to the north-eastern corner of the Isecheno Nature Reserve, and then follows the reserve margins to the small section of the Nyayo Tea Zone.

#### Visitor activity prescriptions

This zone has high numbers of primates and birds, therefore it is a high visitor area, characterised by numerous nature trails. Some of the nature trails are well located and maintained while others are in bad shape and have poor signage. As part of visitor activity prescription, visitors will be required to follow prescribed trails at all times in order to maintain the quality of the viewing experience. Vehicles will only be used to take visitors to drop-off points, where they start their walks, and to pick-up points. In addition, resting sheds, benches and eco-toilets will be availed along the long trails, as specified in the Tourism Development and Management Programme. Specific activities permitted in the Low Use, Focal Visitor Area are set out in Table 6.

#### Accommodation prescriptions

There are a number of tourism accommodation facilities in this zone. Table 4 below shows the visitor accommodation facility prescriptions permitted in this zone:

**Table 4. Isecheno Low Use, Focal Visitor Area: Proposed and permitted tourism facility categories.**

<b>Accommodation type</b>	<b>Location</b>	<b>Existing Number of Beds</b>	<b>Proposed additional Number of beds</b>
Cottage (Rondo)	Kakamega Forest Station	30	-
(Forest /Isecheno Guest house)	Kakamega Forest Station	8	8
Bandas (KEEP)	Kakamega Forest Station	16	10 (outside the PA)
Isecheno Camp Site	Kakamega Forest Station	-	-
Students' Hostel	Kakamega Forest Station	-	40 beds (for students and groups)

Table 5 above shows the existing accommodation facilities in Isecheno Low Use, Focal Visitor Area. There are several facilities located outside the forest protected area in Kakamega town which have been utilizing this zone. These include: the Savona Isle Resort with 16 beds, Golf Hotel with 144 beds, and Siaya Guest House, among others. KEEP is in the process of increasing the bed capacity of their Bandas to 26 from the current 16. However, additional accommodation will be placed outside the protected areas. The Golf Hotel has the highest number of beds and is expected to house a large number of visitors during the high season. The Isecheno campsite which is situated next to KEEP Bandas and the Isecheno Guest House will be relocated adjacent to the KEEP Botanical Garden to ease the current congestion. No further increment of accommodation facilities will be allowed within the Isecheno Low Use-Focal Visitor Area to maintain the ecological integrity of the forest ecosystem.

**Key features and attractions in Isecheno Low Use, Focal Visitor Area**

1. Numerous nature trails
2. Primate watching
3. Forest glades
4. Bird watching
5. Lirhanda Hill view point and caves
6. Research activities.

**Buyangu Low Use, Focal Visitor Area**

The Buyangu Low Use, Focal Visitor Area is positioned on the northern side of the forest at Kakamega National Reserve. It covers approximately 420.9 hectares, which is 1.63 % of KFE. The zone contains a high concentration of primates (six species), birds, butterflies, snakes and other reptiles. Due to the diversity of animal species, high canopy trees, good quality roads and nature trails, this area has established itself as a hub for bird and primate watchers. Apart from visitor accommodation facilities in this zone, other existing facilities include; the KWS headquarters, research camp, staff houses, KEEP education centre, Buyangu gate and the Visitor Information Centre.

**Zone description**

The Buyangu Low Use, Focal Visitor Area stretches from the main gate along the north-western side, including Mukangu area, down the official boundary to the narrow strip towards the forest

near Buzambuli River. It follows Buzambuli River to Buyangu glade to include the Buyangu Hill. It then stretches from the Isiukhu River trail to Isiukhu falls, then goes up to the official boundary and ends at the gate.

### Visitor activity prescriptions

This zone generally registers the highest number of visitors in the northern part of Kakamega forest. It is comprised of numerous primates and birds, as well as a diverse network of nature trails. Similar to the Isecheno Low Use Focal Visitor Area, some nature trails in this area are wrongly sited. These will be closed or redesigned. Existing trails are well maintained with signages. Visitors will be required to stick to prescribed trails at all times in accordance with the visitor activity prescription, to uphold a high quality viewing experience. Additionally, a vehicle will be used to take visitors to designated drop-off and pick-up points. Long trails will be furnished with resting sheds, benches and eco-toilets. Specific activities permitted in the Low Use, Focal Visitor Areas for both Isecheno and Buyangu are set out in Table 5 below.

**Table 5. Low Use, Focal Visitor Area: Visitor activity prescriptions**

<ul style="list-style-type: none"> <li>▶ Guided Nature Walks (Birding, Primate and Butterfly watching).</li> <li>▶ Picnicking in designated areas</li> <li>▶ Camping in designated areas</li> <li>▶ Hiking at Buyangu Hill</li> <li>▶ Special Walks: Night walks, Sunrise walks – with authority from KFE management</li> </ul>
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### Accommodation prescriptions

The Buyangu Low Use-Focal Visitor Area has a number of visitor accommodation facilities as indicated in Table 6 below.

**Table 6. Buyangu Low Use, Focal Visitor Area: Proposed and permitted tourism facility categories.**

Accommodation type	Existing Number of Bed	Proposed bed capacity
Udo's Bandas	14	12
Isukuti Guest House	8	8
De-Brazza Bandas/Campsite (outside the PA)	6	-
Camp Site	-	-
Ecolodge (Buyangu) – Near Isiukhu falls		30
Student's Hostel	-	40 beds (for students and organised groups only)

The bed capacity in Buyangu Low Use, Focal Visitor Area is quite low and reflects the restrictive measures taken to preserve the ecological integrity of Kakamega Forest National Reserve. Apart from the proposed accommodation facilities (Table 6 above), no additional visitor accommodation facilities will be developed in this zone for the next ten years due to the size of this zone and the need to maintain the ecological integrity of the area.

### Key features and attractions in Buyangu Low Use Focal Visitor Area

1. Diversity of nature trails
2. Isiukhu falls
3. Buyangu hill
4. A number of glades
5. Thick canopy
6. Birding
7. Primate watching
8. Well developed road infrastructure
9. Reserve headquarters, in addition to the main gate with the visitor centre
10. KEEP education Centre and botanical garden

## Low Use Zone

This zone covers a large portion of the KFE. It includes the forest blocks of Bunyala and Malava forests and the rest of KFE, which are neither Low Use-Focal Visitor Areas nor Wilderness Zones (See Figure 4). The KFE Low Use Zone seeks to promote opportunities for exclusivity and isolation, as well as enhance the variety of tourist activities and use options that encourage dispersal among visitors, while regulating their impact on the forest ecology. To improve connectivity and access to the least visited areas of KFE, a foot bridge across Isiukhu River will be constructed, which shall link the southern areas under KFS with the northern areas under KWS.

### Key features and attractions in the Low Use Zone

- Primates
- Isiukhu and Yala Rivers
- Medium sized ungulates – wild pig, antelopes
- Wilderness
- Isiukhu river trail, *Raphias exclesa* – very high palm trees and in a group
- Forest glades
- Sacred sites
- Forest Plantations

### Visitor activity prescriptions

This zone is characterised by dense forest vegetation cover in the main Kakamega forest block and the disturbed Bunyala forest, where PELIS silvicultural activities such as clear-felling and selective logging, have been taking place. The Bunyala zone provides limited visitor activities owing to the dense forest cover combined with the absence of trails and tourist facilities. Generally, this area has less favourable conditions for game viewing than the Low Use, Focal Visitor Area.

The dispersal of tourism use into the low use zone will be encouraged by allowing a wider variety of low impact tourist activities than the Low Use, Focal Visitor Area. These activities include: catch and release fishing, rafting or boating along the Yala River, birding, canopy walks, research activities and night walks along specified routes (management actions relating to the development and regulation of these activities can be found under Management Objective 1 of

the Tourism Development and Management Programme). The specific activities allowed in this zone are set out in Table 7 below.

**Table 7. KFE Low Use Zone: Visitor activity prescriptions**

<ul style="list-style-type: none"> <li>▶ <b>Guided Nature Walks (Birding, Primate and Butterfly watching).</b></li> <li>▶ <b>Picnicking in designated areas</b></li> <li>▶ <b>Camping in designated area</b></li> <li>▶ <b>Special Walks:</b> Night walks, Sunrise walks – With authority from KFE management</li> <li>▶ <b>Rafting or boating:</b> along Yala River (currently being practiced outside the PA)</li> <li>▶ <b>Catch and release fishing</b></li> </ul>
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### Accommodation prescriptions in Low Use Zone

Currently, there are no visitor accommodation facilities in the Low Use Zone. To promote the development of tourism and distribution of tourism activities across the KFE, nature friendly tourism activities and facilities have been recommended. As a result, based on the size and the current level of use, as well as the need to maintain the ecological integrity of this zone, the following facilities are proposed: a 25 bed eco-lodge near Yala River Nature Reserve, a 30 bed eco-lodge near Isecheno Nature Reserve, a campsite in Kibiri Forest Station, and a 30 bed eco-lodge and campsite in Malava Forest which will encourage visitation to Malava Forest. The Malava Forest is the least visited due to forest destruction over the past years, but rehabilitation efforts are on-going, and further rehabilitation has been proposed under the Forest Resource Management Programme. Another campsite will be permitted in Kibiri Forest Station which lacks any tourism facility. Additional tourism developments will be considered following the procedure recommended in Action 1.2, of the KFE Tourism Development and Management Programme. See Table 8 below for a summary of the proposed and permitted tourism facilities for the Low Use Zone.

**Table 8. Low Use Zone proposed and permitted tourism facility categories**

<b>Accommodation type</b>	<b>Existing Number of Bed</b>	<b>Proposed bed capacity</b>
Eco-lodge – near Yala River Nature Reserve	-	25
Eco-lodge – Near Isecheno Nature Reserve	-	30
Eco-lodge – Malava Forest	-	30
Camp site - Kibiri Forest Station	-	
Camp Site – Malava Forest	-	

## Wilderness Zone

The Wilderness Zone represents areas of the ecosystem which are least developed and least accessible. Opportunities for game viewing are particularly limited due to inadequate vehicle access roads and nature trails. This zone has been primarily designated to protect pristine forest areas and provide refuge for wildlife. The KFE Wilderness Zone comprises of the Yala River Nature Reserve, Isecheno Nature Reserve, the Kisere forest and the remainder of the Kakamega Forest National Reserve that is not included in the Buyangu low-use-focal visitor

area. This zone is reserved and managed for conservation and the provision of special opportunities for research.

### **Yala River Nature Reserve Wilderness Zone**

The Yala River Nature Reserve lies within the southern section of the Kakamega Forest, covering an area of approximately 535.1 Ha. The southern part of the Yala River Nature Reserve falls under Vihiga District (under Kibiri forest station), whose boundary runs along the Yala River, while the northern part of the nature reserve lies in Kakamega District (under Kakamega forest station), all under the management of KFS.

### **Kisere Forest Wilderness Zone**

Kisere forest is located approximately 20.8 km north-east of Kakamega town. This zone measures 471.6 Ha and encompasses the entire forest. Kisere Forest was gazetted at the same time as Kakamega Forest National Reserve, and falls under the management of KWS. It comprises of mixed hardwood forest with a wide range of animal species. The De Brazza's monkey is limited to this forest. With the exception of the De Brazza's monkey, birds and high canopy trees, this zone has no other major attractions.

### **Kakamega Forest National Reserve Wilderness Zone**

Most of the KFNR is a Wilderness Zone and registers low visitation due to the dense nature of the forest with under-developed access roads or trails. There are however a few nature trails which have been established to give visitors the opportunity to view high canopy birds, primates and the natural forest.

### **Isecheno Nature Reserve Wilderness Zone**

Isecheno Nature Reserve lies within the Kakamega Forest and is situated in the southern portion of the forest. It covers approximately 300.1 km<sup>2</sup>.

#### **Key features and attractions in the Wilderness Zone**

- Isecheno and Yala River Nature Reserves are the only two areas with natural and near natural forest type in the southern section of the ecosystem
- Unique riverine forest type
- Canopy lookout tower to enable visitors to view the upper tree canopy and its flora and fauna (Isecheno)
- Contains both pristine forest glades
- One of only two sites in KFE that has forest untouched by legal timber exploitation
- Yala Falls
- Birding – two endemic bird species, the African Grey Parrot and the Black-billed Turaco nest here
- Hippo pools at Kimingini (outside PA Yala River)

- Butterflies
- Yala river
- Primates
- High protection

### Visitor activity prescriptions for the Isecheno Wilderness Zones

These zones enjoy strict protection by both KWS and KFS as they comprise of areas which have never experienced extensive logging compared to the other parts of the ecosystem. As a result, the zones are representative of local forest types of the once Guinea-Congolese rainforest, and they are the habitat for rare species such as the De Brazza monkey, the African Grey Parrot and the Black-Billed Turaco, the endangered *Prunus Africana*, the threatened *Olea capensis*, and a watershed. The recommendation for the management in this area is to protect the undamaged forest areas, provide refuge for wildlife, and allow only nature friendly visitor activities.

In light of the above recommendation, a limited number of nature trails in sensitive areas will be established to reduce disturbance, and a raised canopy tower will be constructed within Kisere Forest Reserve. Nature trails within Yala River and Isecheno Nature Reserves are well established and in use and visitors will only be required to stick to prescribed trails.

### Accommodation prescriptions for the Wilderness Zone

Currently, there are no visitor accommodation facilities in the Wilderness Zone. To maintain the ecological integrity and ensure the protection of the pristine natural forest, no permanent accommodation facilities will be allowed in this zone. However, special campsites will be permitted.

Table 9 provides a summary of both existing and proposed tourism facilities in KFE, as well as their bed capacity.

**Table 9. Overview of KFE existing and proposed zonal accommodation size prescriptions**

<b>Accommodation type</b>	<b>Bed Capacity</b>	<b>Existing</b>	<b>Proposed</b>
Cottage (Rondo)	30	(LUFVA)	
Ecolodge (Buyangu) – Near Isiukhu falls	30		LUFVA
Ecolodge (KFR near Isecheno Nature Reserve)	30		LUZ
Ecolodge (KFR near Yala River Nature Reserve)	25		LUZ
Ecolodge (Malava)	25		LUZ
Banda (Isecheno Guest House)	8	LUFVA	8 beds extension
Self-help bandas (KEEP)	16	LUFVA	10 beds (outside the PA)
Banda (Udos)	14	LUFVA	12 beds extension
Isukuti Guest House	8	LUFVA	8 beds extension
Banda (De-Brazza)	6	(Outside PA)	
Public campsite (Malava)			LUZ

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<b>Accommodation type</b>	<b>Bed Capacity</b>	<b>Existing</b>	<b>Proposed</b>
Public campsite (Kibiri)			LUZ
Students' Hostel	40		LUFVA (Isecheno/Kakamega Forest Station)
Students' Hostel	40		LUFVA (Buyangu)

LUFVA - Low Use Focal Visitor Area

LUZ - Low Use Zone

As part of the zonal prescription for KFE, and in case the management deems it necessary to have additional tourism facilities in the LUZ that have not been included in this Management Plan, such developments will be undertaken as per the recommendations of Action 1.2 of the KFE Tourism Development and Management Programme.



# Ecological Management Programme

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## Programme Purpose and Strategy

The KFE ecological components, processes and services are conserved and understood, and threats to ecological integrity reduced through adaptive management

Kakamega Forest is a major target for protection of biodiversity in East Africa, ranked third highest priority for conservation among forests in Kenya by the World Conservation Union. The forest is dominated by Central and West African lowland species, but due to its elevation (predominantly between 1500- 1600 meters) it also contains Afro-montane species. The Central and Western African influence combines with Afro-montane elements to produce a unique mix of flora and fauna characterised by high species endemism: 10-20% of its species are estimated to be endemic.

The forest has high mammal diversity due to the uniqueness of the Kakamega rainforest though no large mammals exist due to hunting by the local communities. Most conspicuous mammals are monkeys and include the Blue monkeys, Redtail monkeys, Black and White Colobus, de Brazza monkey and the baboons. The de Brazza monkey is extremely rare in Kenya and only a small population of about 25-50 animals occur in Kakamega Forest, specifically at the riverine vegetation of Kisere Forest. This is one species that is considered to be threatened due to the small population size, lack of habitat and harassment from the local communities. The forest is also rich in reptile diversity with 36 snakes, 21 lizards and 1 tortoise having been recorded. Though none of these species is endemic 16 of the species have very restricted distribution. Some species of conservation concern include pygmy chameleon, multi-scaled forest lizard and the Phillips sand snake. Kakamega forest is rich in amphibians with 24 frogs recorded so far. The Kakamega Tree frog is endemic to Kakamega Forest and is thought to be endangered. Insect diversity is high in Kakamega Forest with 487 butterfly species, 72 dragonflies, 170 ant species and 243 bee species.

Like other indigenous forests, Kakamega Forest provides several services and benefits to people. These include water catchment protection, micro-climate regulation, wildlife conservation, pole and fire wood supply, medicinal plants and cultural sites. However, despite its high biodiversity and conservation value, species, habitats and the ecosystem as a whole, are threatened especially by over-harvesting of trees, exacerbated by the small size of the forest and its location amidst one of the most densely populated agricultural areas in the world, at 600 people per square km.

Kakamega Forest is generally highly degraded and fragmented due to past commercial logging activities and other anthropogenic disturbances. The discovery of gold in the 1920's, led to selective logging of valuable hardwoods including Elgon olive (*Olea capensis*), Mukomari (*Cordia africana*) and African satinwood (*Zanthoxylum gillettii*) from the forest. The natural forest cover of Kakamega was reduced from 23,785 ha in 1933 to 13,990 ha in the 1990s. Past forestry operations converted large areas of natural forest into different forest management types. Kakamega Forest today consists of a mosaic of natural forest stands, plantations with a

mixture of indigenous tree species, monocultures, secondary forest stands and open patches of glades

## Guiding principles

The following section sets out key guiding principles underpinning the Ecological Management Programme. These principles are derived from national forest and wildlife management policies outlined in the following sections.

### **Monitoring and understanding of the ecological dynamics of the KFE is critical**

Ecosystem management decisions must be based on sound science, including proper evaluation of the focal resources to understand the implications of management actions and thus minimize risks to resource values. Historical logging, use of the shamba system, poaching of wild animals and invasive plant species has had major impacts on KFE dynamics. Water availability and quality in the KFE is negatively influenced by man through extraction and pollution. This trend is likely to increase due to growing tourism infrastructure. There is need to conduct targeted monitoring and targeted applied research to understand key dynamics of the KFE, and how these factors are changing over time and with human influences. This will entail baseline studies through literature search, gap analysis, and comprehensive field ecological studies to understand natural, acceptable and undesirable aspects of ecosystem changes.

### **Equity in conservation of natural resources is promoted**

The Ecological Management Programme seeks to ensure natural resources in Kakamega Forest are sustainably conserved and that there is both intra and inter-generational equity in their utilization.

To ensure sustainability, utilization of non-renewable natural resources will be conservative, encouraging efficient use and search for alternatives. Consumption of renewable natural resources will be limited to ensure that the rate of regeneration is not exceeded; cognizance is taken of the high pressure that communities currently exert on biodiversity; and sustainable alternatives to relieve pressure on biodiversity are sought. Hence, to enhance social and economic benefits, strong stakeholder participation and gender sensitivity will underpin this management programme.

### **Ecological components, processes and services of the KFE are conserved**

Proposed actions will seek to maintain and enhance the diversity and resilience of the ecosystem's indigenous plant and animal communities and habitats. The role of vegetation cover in protection, micro-climate regulation and provision of woody and non-timber forest products is given due consideration.

The ecological processes of the KFE and human-induced changes in the greater landscape are interdependent; hence management actions aimed at addressing land-use changes and other human-induced changes in the KFE landscape will be implemented.

## Information on KFE is managed and disseminated

Appropriate management responses to address threats to ecological integrity depend on timely availability of relevant information regarding ecological stressors and their trends. In this regard, the Biodiversity Information Center (BIC) has been established to be a repository and dissemination center of KFE information. The BIC will be strengthened to provide leadership in biodiversity research to address key factors influencing change in the ecosystem.

## Identifying ecological management actions

The tables below present conservation targets of the KFE and associated threats as identified by participants during the Ecological Working Group Meeting. Identification of the conservation targets and associated threats was carried out using the Nature Conservancy’s Conservation Action Planning (TNC CAP) method. This method is based on the premise that, with limited human and financial resources available to protected area managers, it is impractical to attempt to manage and monitor every single aspect of the complex ecology of a protected area. Hence, the need to focus ecological management efforts on the protected area’s most important ecological features, their management needs, and the major threats to these features.

Consequently, the TNC CAP involves three main stages: the selection of **conservation targets** and their **Key Ecological Attributes (KEAs)**; the identification and ranking of **threats** to the conservation targets; and the development of **management objectives and actions** to address these threats as well as to enhance the conservation targets. The Conservation Targets and their Key Ecological Attributes are elaborated in table 10 while table 11 gives the conservation target-threat matrix.

**Table 10. Conservation targets**

	<b>Conservation target</b>	<b>Rationale for selection</b>	<b>Important subsidiary targets</b>	<b>Key ecological attributes</b>
<b>Systems</b>	<b>Near natural forest systems</b>	<ul style="list-style-type: none"> <li>▶ Rich in biodiversity</li> <li>▶ Dominant climax plant species</li> <li>▶ Forest dependent birds species – Chapin’s Flycatcher, Turners Eremomela</li> <li>▶ Low disturbance levels</li> </ul>	<ul style="list-style-type: none"> <li>▶ Plant species of conservation concern including <i>Prunus africana</i>, <i>Olea capensis</i>, <i>Zanthoxylum gilletti</i>, <i>Mondia whytei</i>,</li> </ul>	<ul style="list-style-type: none"> <li>▶ Species richness and diversity</li> <li>▶ Disturbance levels</li> <li>▶ Forest size</li> </ul>

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	<b>Conservation target</b>	<b>Rationale for selection</b>	<b>Important subsidiary targets</b>	<b>Key ecological attributes</b>
	<b>Riverine/riparian systems</b>	<ul style="list-style-type: none"> <li>▶ Vital habitat for restricted range species</li> <li>▶ Important water catchment areas</li> <li>▶ Controlling sedimentation and eutrophication of L. Victoria</li> <li>▶ Threats include deforestation, invasive plant species, poor farming methods, pollution</li> </ul>	<ul style="list-style-type: none"> <li>▶ de Brazza's monkeys</li> <li>▶ red-tailed monkeys</li> <li>▶ Clawless Otter</li> <li>▶ Fish species</li> <li>▶ Riverine bird species</li> <li>▶ Riverine vegetation along rivers Yala, Nzoia and Isiukhu</li> <li>▶ Positive water balances and high potential for spring water development</li> </ul>	<ul style="list-style-type: none"> <li>▶ population status of characteristic species</li> <li>▶ Spatial extent of riverine or swamp forest</li> <li>▶ Structure of the riverine/riparian forest</li> <li>▶ Spatial extent of water bodies</li> <li>▶ River flow and pattern</li> <li>▶ Water quality and quality</li> </ul>
<b>Habitats/ Communities</b>	<b>Secondary forest</b>	<ul style="list-style-type: none"> <li>▶ Regenerating formerly disturbed forests</li> <li>▶ Threatened by invasive plant species such as <i>Psidium guajava</i></li> </ul>	<ul style="list-style-type: none"> <li>▶ Characteristic plant species such as <i>Harugana madagascarensis</i>, <i>Antiaris toxicaria</i>, <i>Trema orientalis</i>, <i>Funtumia africana</i> and <i>Psidium guajava</i></li> <li>▶ Degraded sites</li> </ul>	<ul style="list-style-type: none"> <li>▶ Floristic structure and composition of characteristic plant species</li> <li>▶ Abundance of forest related restricted bird species e.g. Chapin fly catcher</li> </ul>
	<b>Indigenous &amp; exotic plantation forests</b>	<ul style="list-style-type: none"> <li>▶ Tree stands of exotic and indigenous species planted for rehabilitation and commercial purposes</li> <li>▶ Monitoring on growth and development stalled</li> <li>▶ Threatened by fire</li> </ul>	<ul style="list-style-type: none"> <li>▶ Indigenous plantation forests include <i>Maesopsis eminii</i>, <i>Olea capensis</i>, <i>Zanthoxylum gilletti</i></li> <li>▶ Wood and Non-wood products associated with the plantations</li> </ul>	<ul style="list-style-type: none"> <li>▶ Extent of coverage</li> <li>▶ Fuel wood and poles volume</li> <li>▶ Merchantable wood volume</li> <li>▶ Forest structure</li> </ul>

	<b>Conservation target</b>	<b>Rationale for selection</b>	<b>Important subsidiary targets</b>	<b>Key ecological attributes</b>
	<b>Forest glades</b>	<ul style="list-style-type: none"> <li>▶ Natural and artificial grasslands</li> <li>▶ Habitats for migratory birds e.g. endangered bird swallows; red duikers; snakes</li> <li>▶ Threatened by fires, overgrazing, invasive plant species and grass harvesting</li> <li>▶ Grazing sites for livestock and wild animals</li> <li>▶ Provide thatching grass for local communities</li> </ul>	<ul style="list-style-type: none"> <li>▶ Red duikers,</li> <li>▶ bushbucks</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population of key grazers</li> <li>▶ Percentage grass cover</li> <li>▶ Frequency of fire occurrence</li> <li>▶ Vegetation structure and composition</li> </ul>
<b>Species</b>	<b><i>Prunus africana</i></b>	<ul style="list-style-type: none"> <li>▶ Tree species of special concern (locally threatened and rare)</li> <li>▶ Prone to over exploitation</li> <li>▶ High quality timber</li> <li>▶ Medicinal value</li> </ul>	<ul style="list-style-type: none"> <li>▶ <i>Olea capensis</i> (Elgon teak) <i>Trichilia emetica</i>, <i>Zanthoxylum gilletti</i></li> <li>▶ High canopy birds such as Chapin flycatcher</li> </ul>	<ul style="list-style-type: none"> <li>▶ Size and distribution of stable population stands</li> <li>▶ Extent of regeneration</li> </ul>
	<b><i>Bush viper</i></b>	<ul style="list-style-type: none"> <li>▶ Locally threatened through poaching for commercial bio-prospecting</li> </ul>	<ul style="list-style-type: none"> <li>▶ Endemic, rare and threatened snakes such as the Green snake, Gold's Cobra and Kaimosi Blind Snake</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population size and structure</li> </ul>
	<b><i>Chapin's Flycatcher</i></b>	<ul style="list-style-type: none"> <li>▶ Range restricted species (High canopy forest specialists)</li> <li>▶ Habitat threatened by deforestation</li> </ul>	<ul style="list-style-type: none"> <li>▶ 254 recorded forest dependent bird species</li> <li>▶ 45 rare or threatened bird species</li> <li>▶ Turner's Eremomela</li> <li>▶ Hornbill</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population size and structure</li> <li>▶ Habitat quality and availability</li> </ul>
	<b><i>de Brazza's monkey</i></b>	<ul style="list-style-type: none"> <li>▶ Rare, range restricted species (population size estimated at 32)</li> <li>▶ Threatened through habitat loss and poaching</li> </ul>	<ul style="list-style-type: none"> <li>▶ Black and White Colobus, Red-tailed monkey, blue monkey</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population size, recruitment and structure</li> <li>▶ Habitat quality and availability</li> </ul>

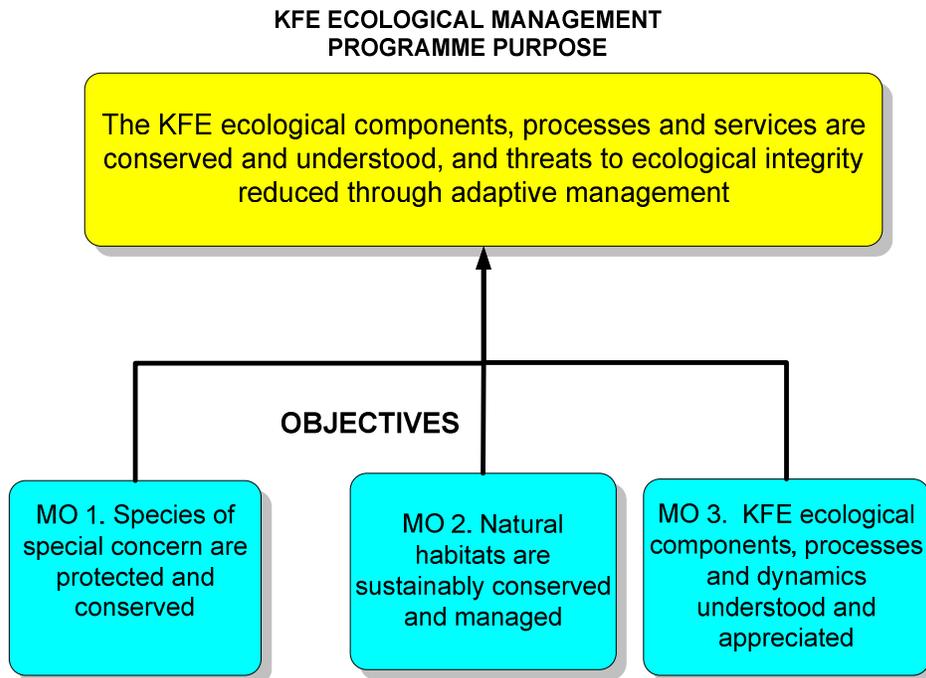
**Table 11. Threats to KFE Conservation Targets**

<b>TARGETS</b>	<b>Near Natural Forest systems</b>	<b>Riverine/riparian systems</b>	<b>Secondary Forest</b>	<b>Indigenous and exotic plantation forests</b>	<b>Forest glades</b>	<b>Bush viper</b>	<b>Prunus africana</b>	<b>Chapin's Flycatcher</b>	<b>de Brazza's Monkey</b>
<b>THREATS</b>									
Water diversion		Medium							
Soil erosion		High							
Sedimentation and pollution		High							
Poor farming systems		High		Medium					
Illegal logging	Medium	Medium	Low	Low			Medium		
Invasive species	Low	High	High		Very High				
Collection of firewood	Low			Low					
Fires	Low		Low	Low	Medium			Low	
Excisions, encroachment	Low			Low	Low				
Poaching of wild animals	Low		Medium			Medium			Low
Charcoal production	Medium		Medium	Low					
Over-extraction of non-timber forest products	Medium			Low					
Overgrazing	Low		Medium	Medium	High				
Infrastructural track development	Low								
Illegal Firewood collection			Medium	Low					
Grass harvesting					Medium				
Habitat loss								Medium	Medium
Debarking							Medium		

## Management objectives

Figure 5 below shows the objectives tree of the KFE Ecological Management Programme.

**Figure 5. KFE Ecological Management Programme objectives tree**



### Objective 1: Species of special concern are protected and conserved

The desired future state of the KFE is a set-up where a rising population of species of special concern is maintained, while the varied threats to their viability are minimized. Kakamega Forest underscores the subject of conservation for its rich biodiversity in flora and fauna, in addition to its renowned status as a highly essential habitat for endemic, rare and threatened species. However, the forest is lacking in the number of endemic species, which is attributed to its developmental history. An example of a recorded plant species unique to this zone is the *Commelina albiflora*. Some of the rare plant species include; the shrub *Vernonia conferta*, orchids like *Oeceoclades ugandae*, a herb species, *Aframomum zambesiaceum*, *Ficus bubu*, and the African Mahogany *Entandrophragma angolense*, regarded as a highly valuable tree for timber.

An extremely rare mammal within the forest is the de Brazza's Monkey, with a population of about thirty individuals. This population is limited to the riverine forest at the edge of the Kisere Forest. In addition, endemic reptiles have been recorded in the KFE, which include two snake species, the Gold's Cobra and the Kaimosi Blind Snake. However, these species are at risk of

extinction due to poaching. The reptile and amphibian population in the forest is inconclusive since earlier research indicates that several of these species have not yet been identified, including several species of terrapin turtles found in the forest ponds. Additionally, vast numbers of invertebrates, particularly soil dwelling biota have not been identified as well. This indicates the presence of abundant opportunities for scientific research in Kakamega, which are of crucial importance to the conservation of this unique ecosystem.

The species of special concern mentioned above face a number of threats which should be addressed effectively to prevent the ultimate risk on their viability. These threats include: habitat degradation, over exploitation, poaching and human-wildlife conflict. This management objective has therefore been designed to ensure that threats to species of special concern are abated in order to preserve healthy and viable populations of these species. The management actions to be implemented under this objective will highlight the necessity of having an excellent understanding of the biology and population status of these species to facilitate efficient conservation.

### **Action 1.1: Carry out a review of research on species of special concern at the KFE**

The current information on species of special concern is scattered, while the managers and scientists lack immediate solutions to pressing issues facing these species. To maintain sustainable populations for the focal taxa requires information to guide appropriate species conservation actions. Hence, KFE researchers will perform a literature search and review existing information regarding species of special concern at the KFE to identify the type of research that has previously been carried out on these species. In regard to this, the information and data generated through the BIOTA project will be reviewed first as this information is readily available at the BIC or the internet. This review will identify knowledge gaps regarding the status and habitat suitability of species, as well as acting as a key resource during the development of the species conservation strategies envisaged under action 1.3 of this management programme.

### **Action 1.2: Carry out surveys to determine population status of species of special concern**

Species of special concern in the KFE remain poorly understood in several important aspects including population size, breeding biology, and habitat requirements. The populations, particularly of primates such as de Brazza's monkey, are small and isolated and therefore vulnerable to disturbance due to habitat degradation.

In order to gain insights on the status of animal and plant species of special concern a de Brazza's monkey survey and a survey of plant species of economic value (*Prunus spp*, *Mondia whytei*, *Osimum spp*) will be conducted. The de Brazza's monkey survey will aim to provide information on the species habitat requirements and population parameters such as population size and population structure. The plant species survey will provide information on the abundance and distribution of species of special concern. This information is essential to provide insight into future management actions.

**Action 1.3: Develop species conservation strategies for selected species of special concern**

This action has been developed to ensure the conservation of certain rare or threatened flora and fauna species such as the *Prunus africana*, *Olea africana*, *Entandrophragma angolense*, de Brazza's, and the giant forest hogs. The realization of this management action will be in line with Article 8(f) of the Convention of Biological Diversity (CBD) which requires each contracting party to rehabilitate and restore degraded ecosystems as well as promote the recovery of threatened species inter alia through the development and implementation of plans or other management strategies.

It is acknowledged that four groups of the rare De Brazza's monkey still exist in Kakamega Forest, but during their discovery 20 years ago, it was established that the forest is particularly small to support this species population, hence the urgent need for conservation of this habitat. To safeguard the viability of the De brazzas monkey in the Kakamega Forest Reserve, a species conservation strategy that details the activities needed to ensure the preservation of this species will be developed.

The Turner's Eremomela (*Eremomela turneri*), a forest canopy bird in danger of extinction, is found in the South Nandi forest in Kenya's Rift Valley province, Kakamega forest (Western province), Western Uganda and the Democratic Republic of Congo. The bird is therefore limited to the Guinea-Congolese forest habitat, extending to the west of Kenya to central Africa. Studies have identified the South Nandi Forest as the main global stronghold for the species. For this reason, linkage between the Kakamega and South Nandi forests will be promoted through support of on-farm forestry in the adjacent areas. Further, similar strategies will also be developed for other threatened plant species in the KFE.

**Action 1.4: Carry out re-introductions and/or re-stocking of species of special concern**

The results and recommendations identified under Action 1.2 of this management programme, will be the basis for re-introductions of threatened and extinct/near extinct plant and animal species, as may be deemed necessary in order to achieve viable populations for the Kakamega Forest. Any factors contributing to imbalances in the growth, age or sex structure of the KFE target species populations will be addressed.

In addition, commercial wildlife and forestry farming for selected species of special concern such *Prunus africana*, *Mondia Whytei*, *Osimum spp.* and *Aloe sp.*, among others will be endorsed as an avenue of enhancing community participation in biodiversity conservation. However, to ensure that new enterprises are viable, existing community based wildlife and on-farm forestry enterprises will be reviewed to have insights on constraints to be addressed and best practices to be adopted while initiating new enterprises. Thereafter, the relevant community forest user groups and individuals will be supported in the development of similar enterprises based on their strengths.

## Objective 2: Natural habitats are sustainably conserved and managed

The Kakamega Forest has a long history of logging and other anthropogenic disturbances, including livestock grazing, firewood collection, and selective logging of valuable tree species. Continuing studies in the transformation of tree population structure and composition in Kakamega forest illustrate that the forest has remained in a relatively good condition over an 18-year period (1981–1999). This was the period when it was preserved to a certain extent by the then, Forest Department, with rangers and researchers maintaining a frequent presence on site. The main signs of disturbance at present include, footpaths, tree stumps and cattle paths. Nevertheless, on the whole, the forest has been recovering from the selective logging of large trees that took place in the 1940s and other subsequent disturbances. Out of the KFE forest blocks, Yala River Nature Reserve, Kisere forest and Isecheno Nature Reserve are least disturbed by commercial exploitation.

The interference to vegetation by cattle is attributable to the presence of abundant pioneer species at these sites. However, despite the local history of disturbance, the considerable variation in tree population structure and composition prevalent within a small area is a noteworthy parameter traceable from periods before large-scale human pressure. This is consistent with the forestation model of Kakamega Forest that envisages forest development by colonising species having established themselves as islands of woodland that later coalesced to form forests.

In essence, the overall prospects for the Kakamega Forest can be improved through enhancing rehabilitation efforts in areas where anthropogenic disturbance, specifically illegal charcoal production and selective pit-sawing remain high. The strategically significant areas in the restoration of the ecological integrity of KFE include the clear-felled central part of Kakamega Forest that separates the Yala-Ikuywa part from the northern part of the forest, as well as the thin and highly degraded forest strip that barely links the Ikuywa and Yala parts of the forest.

Further, the threat of wild fires is prevalent in forest glades and plantation forests. Pastoralists and termite gatherers are allegedly the main agents of fires on forest glades, while farmers on farm site preparations and poachers cause fires in forest plantations.

This objective has therefore been designed to ensure that natural habitats are sustainably conserved and managed by KFE stakeholders. The management actions that will be implemented to realize this objective are elaborated in the following sections.

### **Action 2.1: Establish baseline / bench marks of degraded habitats**

Degraded sites are defined as areas in which over a certain period of time various disturbances have fundamentally altered the natural character of flora and fauna, or depleted it from its original state. Since there are few cases in the KFE where a pre-disturbance state has been documented, the degraded sites are recognized through comparison to other nearby areas, or areas with similar physical characteristics in which the biotic community differs.

In the main forests of the KFE, degraded habitat could be under recovery through natural succession, or otherwise colonized by invasive species and other undesirable vegetation such as grass. The status of degradation in the sites varies; hence different habitat management

approaches are required. The significant element to consider is the status prior to degradation, which covers factors such as composition, ground terrain and soil structure, among others.

The results of remotely sensed time series data and information on fragmentation and disturbance of Kakamega forest will be referred to in order to ensure a comprehensive inventory and mapping of degraded areas, as well as the development of a rehabilitation plan. The key personnel in this exercise will include the Area Wardens, Foresters, Catchment Protection Officers and District Agricultural Officers. Baselines will be recorded in form of GIS based thematic maps and narratives, to illustrate the following factors: areas under various types and levels of degradation, indicator species, farming practices, soil, geology and slope types, and hydrology. These factors are significant in guiding the rehabilitation process as well.

**Action 2.2: Develop guidelines for rehabilitation and restoration of degraded areas**

The latest assessment of the KFE forest cover reveals that parts of Kakamega Forest, particularly Yala, Kaimosi, Ikuywa, Bunyala, Buyangu, and Salazar have experienced severe forest loss while others, especially in the north, such as Kisere and Malava, show signs of succession. In the latter, natural regeneration backed up by protection from extractive use is preferred. Protection may entail strategic placement of ranger outposts which have proved successful in Kakamega Forest Station. Special cases will require experimental trials to test and demonstrate best practices, in addition to enrichment planting, which refers to replanting of denuded areas previously covered with indigenous forest. On the other hand, climber cutting, opening up gaps for pioneer species and selection of leading desirables will improve regeneration of the forest. Artificial regeneration may also be considered for secondary forests and bushland/shrubs. In addition, the bushland/shrub sites under invasive plant species will be thoroughly examined, then the relevant technical notes in regard to their management will be reviewed and put to action. Feasibility studies to assess the role of scattered trees in enhancing grassland rehabilitation will also be conducted. The BIOTA restoration program has realized some of these experimental trials, and the output will be useful for future rehabilitation efforts. Hence the foregoing forest restoration strategies will be reviewed and KFE specific restoration guidelines developed to guide coordinated forest rehabilitation activities.

**Action 2.3: Establish connectivity between Kakamega Forest Reserve and Yala River Nature Reserve**

The Kakamega Forest Reserve and Yala River Nature Reserve are connected by a plantation block which is a potential wildlife corridor/habitat. To enhance the connection between the two reserves, a strategy aimed at improving the status of the plantations for wildlife welfare will be developed. This process will involve treating plantations to encourage the development of mixed indigenous species, while eliminating selective or clear felling, in order to create favourable conditions for regeneration and recruitment of shade tolerant plants as well as light demanders.

**Action 2.4: Control alien and invasive species**

Invasive plants present serious problems to the native flora and fauna by replacing native plant species which may also be important sources of food for forest animals. The currently identified invasive species in the KFE include the *Solanum mauritianum*, the Curse of India (*Lantana camara*), and the Guava tree (*Psidium guajava*). In particular, the *S. mauritianum* is a plant

species with unknown economic value, yet it is a fast growing and aggressive gap colonizer, highly associated with forest disturbance. Thorough literature review and field observations have confirmed that the characteristics of *S. mauritanium* qualify it as a weed. To control alien and invasive species proliferation strategies and opportunities underlying the successive invasion by these species will be re-evaluated and elements of an integrated, multidisciplinary effort to control their adverse impacts inside and outside the forests will be identified. The potential measures that might be applied to mitigate the invasiveness of these species include the following; reducing forest gaps, monitoring their reproductive biology, manual removal of these species, carrying out educative campaigns to prevent local communities from domesticating these species on their farms, undertaking a research programme on *S. mauritanium* to understand causes of its competitive advantage over other invasive species, searching for resistant species to outcompete the *S. mauritanium*, as well as networking with scientists in other countries such as South Africa and Brazil.

### **Action 2.5: Build capacity for sufficiency in seedling production**

One of the challenges facing acquisition of tree planting materials is availability of desired seed stocks as well as quality seedlings. The relevant institutions will strengthen the capacity of the concerned community groups to produce seedlings for rehabilitation. Improvement of tree nursery management will involve the following:

- Training on tree nursery management;
- Providing better incentives for collection of wild seeds by the locals;
- Demonstrating quality seed collection and seedling production through experiments; and
- Tutorials during outreach visits.

### **Action 2.6: Review the fire management plan to enhance fire preparedness**

The KFE is classified as a low fire risk area, which is attributed to the fact that it is a generally wet zone throughout the year (average annual rainfall - 2,000mm, peaks in April – November and a short dry season, December – March). Nevertheless, exotic monoculture plantations face a particularly high risk of fire. Additionally, grasslands expose the forest areas to high fire risks.

Firebreaks in the plantations are well maintained in accordance with standing orders. A burning programme has not specifically been set in the forest reserve, although illegal burning of some glades occurs during the annual dry season to improve grazing. Under this management action therefore, the existing fire management plan(s) will be reviewed to keep up with current fire risk.

### **Action 2.7: Rehabilitate degraded catchments within the livelihood support zone using an integrated and coordinated approach**

The quality of water in the Lake Victoria North (LVN) catchment, which the KFE is part of, has been on the decline due to increased pollution sources. The types of catchment in the livelihood support zone include springs, wetlands, riparian zones and farmlands. As sources of water, springs and wetlands attract several activities such as cultivation through irrigation, water abstraction by livestock watering, domestic and commercial use. These activities have resulted in the degradation of spring sources, and the reduction of water quality, among others. Some of the challenges facing springs in the KFE are:

- ▶ land adjudication and allocation of springs and wetlands to individuals; and
- ▶ disorganized systems of drawing spring water and deforestation of riparian areas has led to drying up of some springs.

Riparian zones are areas around water bodies and protect the water bodies by filtering sediments from incoming run-off. Deposits of fertile soil material in riparian areas attract communities to cultivate subsistence food crops and fast growing commercial trees. The Livelihood support zone is dominantly covered by farmlands and forms the main livelihood resource base for sedentary rural communities. Some of the farmland issues in the Livelihood support zone include:

- ▶ poor farming methods that encourage soil erosion and increased run-off;
- ▶ poor or lack of irrigation methods;
- ▶ lack of proper soil and water conservation measures; and
- ▶ road construction that directs run-off into farmland.

The following activities will be carried out in all catchment areas in close cooperation with key stakeholders:

- ▶ preparation of inventories and general maps;
- ▶ assessment of available information in cooperation with key partners;
- ▶ delineation and prioritization of catchment areas; and
- ▶ planning, facilitation and implementation of land protection activities.

### **Action 2.8: Support assessment of water resources in the KFE**

The KFE lies in the upper and middle zones of the Lake Victoria North (LVN) Catchment, where the main rivers Yala, Nzoia and Isiukhu traverse foot slopes of main water towers and run downstream into Lake Victoria. There are additional tributaries, some of which originate from Kakamega Forest and drain into the main rivers. These rivers have positive water balances and high potential for spring water development and relatively high specific water discharge.

The challenges involved in water management in the Lake Victoria North (LVN) Catchment include the following:

- ▶ decline in water availability over the years as a result of unmatched population growth;
- ▶ inadequate water balance database;
- ▶ ineffective metering, monitoring and compliance; and
- ▶ over-allocation of water.

The assessment of the water resources in KFE is ongoing and involves the development of a Biological Monitoring and Assessment Tool (BIOMAT) for KFE Watershed. The watershed is being assessed, with a keen focus on development of a water quality and quantity map that identifies environmentally sensitive sites.

In view that water is a finite resource, there is need to determine current and future water supply and demand to be able to make informed decisions on water balance trends. The local sub-regional office of WRMA is leading this activity and KFE management will maintain its support as

well. This activity will also involve identification of major water uses, in addition to promoting water conservation awareness campaigns. This step will generate data and information necessary for preserving water supplies, and matching water availability with demand. The water conservation awareness will address the potential of catchments, their limitations and the essential conservation measures.

### **Action 2.9: Develop off-take models for currently exploited Wood and Non- Wood Products (NWFPs)**

Taking into account the diverse benefits of the Kakamega Forest's rich biodiversity, it is fundamental to establish a balance between species conservation, habitat preservation and sustainable productivity of the forest blocks for non-timber products, which are the main resources targeted by inhabitants of the livelihood support zone.

This balance will be achieved through the following activities:

- ▶ evaluating baseline availability and suitability of products, including pasture, water, fuel wood, herbal medicine, round wood and fibre known to exist within the forests;
- ▶ determining and recommending the number of users (including cattle and non-extractive users) that can be sustained within the livelihood support zone; and
- ▶ establishing an inbuilt forest based NWFP utilization framework and an outline for habitat monitoring.

The proposed Scientific Advisory Committee (See Action 3.3 under this programme) will liaise with the Livestock Department and the Kenya Forest Service to review model(s) currently under use.

### **Action 2.10: Promote alternative and supplementary community nature- based livelihoods**

The Kakamega forest is located in one of the world's most densely populated rural areas with an average density of 600 people per square kilometre. There are various courses of action required to lessen the impact of the anthropogenic threats experienced in the forest, and these include the following: supporting representative community groups in pasture and poultry development; promoting renewable energy technologies; and setting up nurseries for indigenous species. The existing projects that are similar to the aforementioned will be evaluated, and if necessary a Participatory Rural Appraisal (PRA) will be conducted to identify areas for improvement.

The ongoing community-owned projects include:

- ▶ *Mondia whytei* production;
- ▶ *P. africana* farming;
- ▶ *Ocimum kilimandscharicum* cultivation for essential oil production;
- ▶ apiculture;
- ▶ tree seedlings production in nurseries; and
- ▶ medicinal plants extraction and processing.

The KFE management will work closely with the groups undertaking these projects to ensure their success and sustainability. This will be carried out through assisting in the identification of potential markets, improving community capacity in project management and linking them with other related projects in Kenya.

### **Objective 3: KFE ecological components, processes and dynamics understood and appreciated**

The stakeholders of KFE have adequate capacity for research and monitoring change in critical attributes of the established conservation targets. However, resource allocation and distribution towards the realization of this function is inadequate. As part of the forest management team, the Warden and Foresters require the astute advice of proficient scientists in order to make informed decisions. For this reason, there is need for the formation of a Scientific Advisory Committee to oversee ecological management activities during the lifespan of this management plan. This is in cognisance of the high biodiversity values and the multiple factors influencing change in the KFE, for example, the expansion of undesirable plant communities, infrastructure and visitor numbers, as well as land-use changes impacting on migration routes and water catchments. The management actions to address this objective are elaborated in the following sections.

#### **Action 3.1: Conduct inventory of taxa that have not been exhaustively studied in Kakamega Forest**

There are some taxa in Kakamega Forest which have not yet been recorded. Therefore, biodiversity inventories using standard methods will be conducted by experts to characterize unidentified species in Kakamega forest.

#### **Action 3.2: Develop and implement an Ecological Monitoring Programme**

The Ecological Management Programme will enhance the regional economy, particularly through actions and new technologies that will deliver benefits through sustainable use of flora and fauna, human capital, and catchment assets.

The achievement of viable populations in the KFE could easily be undermined by a number of factors, for instance, poaching, disease, and intra/inter-specific competition. For this reason, it is essential to monitor the populations of species-level targets, in order to inform the KFE managers on the overall status and trends in their populations, and as the foundation for the implementation of the management actions. Monitoring is particularly important in the KFE due to the high investment in security, management and baselines studies on the forest and its other ecological components.

There have been several biodiversity studies conducted in the KFE but a holistic review of the applied methodologies and results obtained is lacking. Further, based on the dominant pressures affecting the KFE, the monitoring process directed towards the status of the species-level targets and major threats is a priority during the lifespan of this management plan.

Therefore, the ecological monitoring programme will be designed and implemented in a way that adequately supports adaptive management and the assessment of management effectiveness. This process will entail the following:

- ▶ collaborative harmonization of methodologies applicable to ecological monitoring in the Kakamega forest systems; and
- ▶ publicizing agreed-upon methods to ensure they are easily available to researchers with the desire to participate in this effort.

Implementation of the programme will encompass the following elements: regular data collection, generation, analysis and dissemination of information regarding conservation targets and their habitats, as well as other ecological change factors. The expected output is an integrated and standardized monitoring programme that will improve the distribution of information on status and performance of each target.

### **Action 3.3: Establish an operational Scientific Advisory Committee (SAC) for the KFE**

Visiting research scientists have not consistently followed a standard procedure in permit acquisition, data collection and feedback to forest management authorities. An inter-institutional team is therefore needed to advise KFE management on priority research and management areas so that management is science driven. Hence, a Scientific Advisory committee will be established with the following roles:

- ▶ to identify priority research areas;
- ▶ to coordinate and conduct research activities; and
- ▶ to harmonize research methodologies.

The committee members will assist in addressing these research irregularities by ensuring that organizations or individuals undertaking biodiversity research in the KFE submit their progress and technical reports to the SAC on a regular basis.

The committee will comprise of an equal representation of members from the following entities; the Kenya Wildlife Service, Kenya Forest Service, National Museums of Kenya, Kenya Forest Research Institute, National Environmental Management Authority, Masinde Muliro University of Science and Technology, Kenya Climate change, and Nature Kenya. Other relevant members will be co-opted when it is deemed necessary.

### **Action 3.4: Ensure the sustainability of the KFE Biodiversity Information Centre (BIC)**

Scientific information on KFE is currently scattered, hence this initiative seeks to consolidate this information. Existing databases will be used to develop an all inclusive taxa database. The management will facilitate the collection and collation of scattered KFE information and maintain a database in collaboration with the proposed SAC (See Action 3.3). Also, relevant personnel in the KFE will be trained in database and information management

**Action 3.5: Disseminate research information on ecosystem values and requirements for conservation of the KFE**

Research results produced on socio-economic and ecology of KFE and buffer zones will be synthesized and disseminated to dwellers of the livelihood support zone by conservation education officers and area managers. Thematic lessons will include the potential use/non-use of the Protection Zone, Core Forest Zone, Potential Utilization Zone and Livelihood Support Zone, to supply certain goods and services already utilized by communities. In addition, information on biodiversity trends of the forest blocks, and the required interventions to preserve option values and conserve its ecological capacity to supply goods and services will be disseminated.

# Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Ecological Management Programme. The activity plan details the activities, responsibilities, and timeframe for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, the plan sets out specific and time bound “milestones” that KFE management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2012-13				FY 2013-14				FY 2014-15					
		1	2	3	4	1	2	3	4	1	2	3	4		
<b>Objective 1: Species of special concern are protected and conserved</b>															
<b>1.1: Carry out a review of research on species of special concern at the KFE</b>															
1.1.1 Conduct literature search for existing information to document species and habitat status	KWS SRS, NMK SRS; KFS HoC & H-Biodiversity KEFRI													Species conservation guidelines for priority species reviewed and developed by March 2014	
1.1.2 Identify knowledge gaps															
1.1.3 Develop annotated checklist of priority species of conservation concern															
1.1.4 Assess population status of priority species															
1.1.5 Identify appropriate conservation strategy ( <i>in-situ</i> or <i>ex-situ</i> ) and develop species –specific conservation guidelines for priority species															
<b>1.2: Carry out surveys to determine population status of species of special concern</b>															
1.2.1 Conduct a De Brazza's monkey survey	KWS SRS; NMK SRS; KFS HoC, KEFRI													A Biodiversity status report for species of special concern prepared by June 2015	
1.2.2 Conduct a survey of plant species of economic value such as <i>Prunus spp</i> , <i>Mondia whytei</i> , and <i>Osimum spp</i>															
<b>1.3: Develop species conservation strategies for selected species of special concern</b>															
1.3.1 Establish a task force to steer the formulation of a species conservation strategy for species of concern	KWS SRS; NMK SRS; KFS HoC,													Conservation strategies for species of concern	

Management Action and Activities	Persons responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.3.2 Identify stakeholders/researchers who have been involved in research on species of concern	KEFRI													developed by June 2015
1.3.3 Develop a work plan for the development of the strategy														
1.3.4 Support on-farm forestry for areas between Kakamega and South Nandi forests to create linkage of the two forests														
<b>1.4: Carry out re-introductions and/or restocking of species of special concern</b>														
1.4.1 Conduct feasibility studies on species-specific re-introductions, restocking and community farming	KWS SRS; NMK SRS; KFS HoC & H-Biodiversity													Re-introduction/restocking/community farming programme ready by June 2014 its implementation completed by June 2015
1.4.2 Select and implement best options for strengthening and maintaining viable populations														
<b>Objective 2 Natural habitats are sustainably conserved and managed</b>														
<b>2.1: Establish baseline / bench marks of degraded habitats</b>														
2.1.1 Conduct comprehensive baseline inventories and map degraded areas	NMK SRS; KFS HoC & H-B, KWS SRS, KEFRI													Baseline report on degraded sites in place by September 2014
<b>2.2: Develop guidelines for rehabilitation and restoration of degraded areas</b>														
2.1.2.1 Continue and improve on-going experimental trials geared towards enhancing natural regeneration, succession and controlling invasive plants	NMK SRS; KFS HoC, H-B, KWS SRS													Guidelines on rehabilitating degraded areas developed by 2013
2.1.2.2. Develop guidelines on best practices for rehabilitating degraded sites														
<b>2.3: Establish connectivity between Kakamega Forest Reserve (KFR) and Yala River Nature Reserve (YRNR)</b>														
2.3.1 Conduct an ecological assessment for the corridor between KFR and YRNR	KWS SRS; NMK SRS;													Reversion of 3

**ECOLOGICAL MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.3.2 Develop a strategy aimed at improving the status of the plantation between KFR and YRNR	KFS HoC & H-Bb													improperly forested sites operationalized by July 2012  Rehabilitation of degraded ecological corridors initiated and operationalized in compartments (2b, 2c, 2d) by June 2015
2.3.3 Review and adopt silvicultural practices for indigenous tree plantations in line with technical orders and guidelines														
2.3.4 Develop operational plan for management of various ecological corridors e.g. between i) Northern block and southern block, ii) Yala block and Ikuywa, iii) Yala and Northern [see the zonation scheme Fig. 3														
<b>Action 2.4: Control alien and invasive species</b>														
2.4.1 Adopt measures that have been identified to mitigate the invasiveness of alien and invasive species. The measures include: - Reducing forest gaps - Monitoring it's reproductive biology to eliminate mother trees before seeding - Carrying out educative campaigns to prevent local communities from domesticating these species on their farms - Undertaking a research programme on <i>S. mauritianum</i> to understand causes of its competitive advantage over other invasive species - Searching for resistant species to outcompete the <i>S. Mauritium</i> - Networking with scientists in other countries such as South Africa and Brazil	KFS HoC & H-B, KWS SRS, KEFRI													Mitigation measures for the control of invasive species adopted and applied
<b>2.5: Build capacity for sufficiency in seedling production</b>														
2.5.1 Train stakeholders and community on tree nursery management	KWS SRS; NMK SRS; KFS HoC & H-B, KEFRI													20 community tree nursery groups trained by June 2013
2.5.2 Demonstrate quality seed collection and seedling production through experiments and tutorials during field schools														

Management Action and Activities	Persons responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.5.3 Device an incentive mechanism for collection of wild seeds and wildling by the locals														
<b>2.6: Review the fire management plan to enhance fire preparedness</b>													A KFE fire management Plan developed and operationalized by June 2013	
2.6.1 Review and operationalize existing a KFE fire management plans	KFS HoC; KWS SRS; NMK SRS													
2.6.2 Establish necessary firebreaks and ensure regular maintenance of existing ones														
2.6.3 Capacity build KWS, KFS, and key stakeholders on fire management														
<b>2.7: Rehabilitate degraded catchments within the livelihood support zone using an integrated and coordinated approach</b>													A status report on KFE Catchment areas produced by September 2012  Rehabilitation of 2 catchment areas initiated by December 2013	
2.7.1 Inventorise and map KFE catchment area including wetlands in collaboration with key stakeholders	KFS HOC; KWS SRS; NMK SRS, WRMA													
2.7.2 Delineate and prioritise key catchment lands for management														
2.7.3 Facilitate rehabilitation and protection of priority catchment areas														
<b>2.8: Support assessment of water resources in the KFE</b>													Water monitoring programme in place by March 2014  One awareness workshop organized on annual basis from September 2013	
2.8.1 in liaison with WRMA, and based on existing monitoring baselines, support monitoring of water quality and quantity of the main rivers and streams	KFS HOC; KWS SRS; NMK SRS, WRMA, WRUA													
2.8.2 Select major water users for awareness education														
2.3.3 Promote water conservation awareness campaigns														
<b>2.9: Develop off-take models for currently exploited wood and Non-Wood Forest Products (NWFPs)</b>													A draft off-take model for wood and NWFPs developed by June 2015	
2.9.1 Undertake a resource inventory of wood and non-wood forest products	KFS HOC; KWS Warden & SRS; NMK SRS,													
2.9.2 Establish carrying capacity and off-take levels of wood and non-wood forest products														

**ECOLOGICAL MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.9.3 Determine and recommend sustainable demand levels for wood and NWFPs in the livelihood support zone	Min. of National Planning and development													
2.9.4 Undertake research on production, value addition and marketing of wood and NWFPs														
2.9.5 Undertake regular surveys and periodic forest inventories on wood and non-wood forest products														
2.9.6 Set up a monitoring system for NWFPs production and market demand														
<b>2.10: Promote alternative and supplementary nature - based livelihoods to communities</b>														
2.10.1 Identify alternative nature-based livelihoods using participatory tools	KFS HoC, H-Enterprise Development, Community Warden & AD-Enterprise Development NMK, SRS													Market survey report availed by June 2014  Two community training workshops held annually from July 2013
2.10.2 Conduct market surveys to identify potential markets of the nature based enterprises														
2.10.3 Capacity build the local community on management of the nature based enterprises														
<b>Objective 3 KFE ecological components, processes and dynamics understood and appreciated</b>														
<b>3.1: Conduct inventory of taxa that have not been exhaustively studied in Kakamega Forest</b>														
3.2.1 Identify KFE taxa that have been studied in the past	KFS HoC, AD WCA, NMK Director Research and Collections (DRC)													Biodiversity inventory report ready by March 2014
3.2.2 Conduct inventories using standard methods in liaison with other researchers														
<b>3.2: Develop and implement an ecological monitoring programme</b>														
3.2.1 Based on Action 1.1 of this programme, identify target species for ecological monitoring	KWS SRS; NMK SRS; KFS HoC & H-Biodiversity													Ecological reports of target species and their habitats produced on annual basis
3.2.2 Conduct ecological assessments on the identified target species and their habitats														
3.2.3 Develop species-specific monitoring guidelines														

Management Action and Activities	Persons responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.2.4 Identify, geo-reference/mark monitoring sites for target species														Ecological monitoring guidelines developed by June 2014
3.2.5 Conduct consistent monitoring surveys														
<b>3.3: Establish an operational Scientific Advisory Committee (SAC) for the KFE</b>														
3.3.1 Identify relevant stakeholders for membership	KFS HoC, AD WCA, NMK Director Research and Collections (DRC)													Operational SAC formed by December 2012
3.3.2 Develop terms of reference for the SAC														
3.3.3 Constitute and empower the SAC														
<b>3.4: Ensure the sustainability of the KFE Biodiversity Information Centre (BIC)</b>														
3.4.1 Lobby for the inclusion of BIC in the development of the KWS-KFS MoU	KFS, KWS, NMK													KFE BIC mainstreamed in KWS-KFS management by December 2012
3.4.2 Mainstream BIC in annual work planning and budgeting														
3.4.3 Recruit appropriate human resource for the management and running of BIC														
3.4.4 Capacity build relevant personnel on database and information management														
3.4.5 Allocate necessary equipment and materials for BIC operations														
3.4.6 Give the BIC management the semi-autonomy to solicit for external funding														
3.4.7 Consolidate and collate existing scientific information in liaison with other institutions														
3.4.8 Develop (and update regularly) an all-taxa inclusive database														
3.4.9 Establish operational collaborations with local, national and international learning and research institutions														

**ECOLOGICAL MANAGEMENT PROGRAMME**

<i>Management Action and Activities</i>	<i>Persons responsible</i>	<i>Timeframe</i>												<i>Milestones</i>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
<b>3.5: Disseminate research information on ecosystem values and requirements for conservation of the KFE</b>														
3.5.1 Customize outreach and education materials from research findings	KFS HoC; KWS Warden & SRS; NMK SRS BIC Officer													Outreach materials developed by September 2013
3.5.2 Disseminate information through opportune public events e.g through workshops, posters, brochures, booklets, trade fairs, environmental days, talks in schools	BIC Officer													
3.5.3 Create a website for BIC with links to other key stakeholders	BIC officer													

## KFE Ecological Monitoring Plan

In addition to the programme's management objectives and actions, the other key component of the Ecological Management Programme is the KFE Ecological Monitoring Plan. An additional benefit of the TNC CAP methodology described above is that the threats and Key Ecological Attributes (KEAs) identified through the process also provide a comprehensive framework for monitoring the overall status of the conservation targets, and therefore a surrogate measure of the health of the entire KFE ecosystem. The use of the threats and KEAs also ensures that there is a direct connection between the components of the ecosystem and this programme's management objectives and actions. In this regard, the Ecological Monitoring Plan not only provides a basis for monitoring of the overall welfare of the ecosystem, but also for the assessment of the effectiveness of management actions under this programme, including recommendations to improve the programme.

The framework for the development of the KFE Ecological Monitoring Plan is set out in Table 12 below. As shown in this table, the plan framework is based on the conservation targets. The indicators of change provide easily measurable attributes for assessing the status and trends of the KEAs or threats to each conservation target. The indicators selected also provide an early warning of any serious threats that may develop during the lifespan of this plan, which may potentially require the development of new management actions. The framework also outlines the data collection methodology, which establishes how, when, where and who will collect the data for the indicators. This framework provides the outline for the development of a comprehensive **KFE Ecological Monitoring Plan**, which will be elaborated and developed by the relevant research stakeholders at the beginning of the lifespan of this management plan. The stakeholders will be responsible for ensuring that monitoring activities are included in annual work plans.

**Table 12. KFE Ecological Monitoring Plan Framework**

<i>KEA/Threat</i>	<i>Indicator of change</i>	<i>Method of measurement</i>	<i>Collection frequency</i>	<i>Data source</i>	<i>Responsibility</i>	<i>Data currently collected</i>
<b>Conservation Target 1: Near Natural Forest systems</b>						
<b>KEA:</b> Species richness and diversity <b>Threat:</b> Illegal logging, over extraction of non woody forest products	Species diversity and composition	Transects and Permanent Sampling Plots to assess species composition	Bi-annual	Monitoring reports	KWS/KFS/NMK/KEFRI scientists	Some data is available

## ECOLOGICAL MANAGEMENT PROGRAMME

<b>KEA/Threat</b>	<b>Indicator of change</b>	<b>Method of measurement</b>	<b>Collection frequency</b>	<b>Data source</b>	<b>Responsibility</b>	<b>Data currently collected</b>
<b>KEA:</b> Forest extent	Area under near natural forest	Analysis of satellite images	Every 5 years	Land cover change report	KWS/KFS/NMK/KEFRI scientists	Baseline data available
<b>KEA:</b> Disturbance levels <b>Threat:</b> Illegal logging, collection of firewood, invasive species	No. of disturbance indicators such as charcoal kilns, logged tree stumps, arrested loggers,  Percentage of area under invasive species	Sampling transects, Patrols	Bi-annual; Daily patrols	Patrol registers, Occurrence Book, Quarterly reports	KWS/KFS/NMK/KEFRI scientists, KFS/KWS security agents	Baseline reports available
<b>Conservation Target 2: Riverine/Riparian systems</b>						
<b>KEA:</b> Population status of characteristic species <b>Threat:</b> Poaching	Population size and structure	Sampling transects	Bi-annual	Census reports	KWS/KFS/NMK/KEFRI scientists	Baseline reports for de Brazza's monkey available
<b>KEA:</b> Size of riverine forest or swamp forest <b>Threat:</b> illegal logging, poor farming systems	Area under riverine forest; Area under water bodies	Analysis of satellite images and aerial photos; ground observations	Every 5 years; daily	Land cover changes report; Quarterly reports	KWS/KFS/NMK/KEFRI scientists, WRMA	No data is available
<b>KEA:</b> River flow and Pattern <b>Threat:</b> Water diversion; Sedimentation	Water level in key rivers	Installing and taking reading from water flow meters	Daily	Water flow monitoring reports	KFE - RS/ WRMA Sub-regional office	-----
<b>KEA:</b> Water Quality <b>Threat:</b> Pollution	Amounts of dissolved chemicals in water; Bacteriological level; turbidity and total	Direct measurements and laboratory analysis of chemicals in water samples	Wet and dry seasons	Water quality analysis reports	KFE -RS/ WRMA Sub-regional office	-----

<b>KEA/Threat</b>	<b>Indicator of change</b>	<b>Method of measurement</b>	<b>Collection frequency</b>	<b>Data source</b>	<b>Responsibility</b>	<b>Data currently collected</b>
	suspended solid values					
<b>Conservation Target 3: Secondary Forest systems</b>						
<b>KEA:</b> Composition and structure of characteristic plants species <b>Threat:</b> Illegal logging	<ul style="list-style-type: none"> <li>▪ Number of species and their % crown cover</li> <li>▪ Number of stumps of characteristic species</li> <li>▪ Amount of confiscated wood material</li> </ul>	Sampling transects to assess vegetation composition & structure	every 3 years	Vegetation survey reports	KFE – RS	Data available
<b>KEA:</b> Abundance of related forest restricted bird species e.g. Chapin fly catcher	Number of characteristic bird species	Point counts	Annual	Bird survey reports	KFE – RS, KFE – Birders, NMK ornithology, Nature Kenya	Baseline data is available
<b>Threat:</b> invasive plant species	Invasive species distribution and area covered	Sampling transects to assess invasive species, composition & structure	Every 3 years	Vegetation cover reports	KFE – RS, KFS – HB	Some data available
<b>Conservation Target 4: Indigenous and exotic plantation systems</b>						
<b>KEA:</b> Extent of coverage	Area under characteristic plantations	Aerial and ground surveys	every 3 years	Ground counts and aerial survey reports	KFS Forester/KFE - RS	Baseline data available for all species
<b>KEA:</b> Round or timber yield	Merchantable wood volume	Permanent sample plots using standing volume assessment	Annually	KFS forest inventory reports	KFS Forester/KEFRI - RS	Partial
<b>KEA:</b> Fuel wood and poles yield	Fuel wood volume and poles volume	Permanent sample plots using <ul style="list-style-type: none"> <li>▪ Standing volume assessment for poles</li> <li>▪ Ground scaling for fuel</li> </ul>	Annually	KFS forest inventory reports	KFE – RS/KFS - Forester	Partial

**ECOLOGICAL MANAGEMENT PROGRAMME**

<b>KEA/Threat</b>	<b>Indicator of change</b>	<b>Method of measurement</b>	<b>Collection frequency</b>	<b>Data source</b>	<b>Responsibility</b>	<b>Data currently collected</b>
		wood				
<b>Threat:</b> Poor farming systems	Practices that are non-conforming	<ul style="list-style-type: none"> <li>▪ Analysis of data on NRC/Shamba system/PELIS reports</li> </ul>	Annually	KFS NRC/PELIS reports	KFE - RS	No
<b>Threat:</b> Overgrazing	No. of excess Livestock on plantation site per time	<ul style="list-style-type: none"> <li>▪ Analysis of data on grazing from KFS Occurrence Books</li> <li>▪ Random survey</li> </ul>	Annually	KFS / KWS occurrence books	KFE – RS	Partial
<b>Conservation Target 5: Forest Glades</b>						
<b>KEA:</b> Population of key grazing species	Population size and structure of key grazing species	ground counts	after every 3 years	Fauna Ground count reports	KFE - RS	Partial
<b>KEA:</b> Extent of grass cover	Area under grassland	Analysis of satellite images	every 3 years	Land cover change report	KFE-RS	Some data available
<b>KEA:</b> Quantity of forage	Amount of available forage biomass	Permanent sample plots	Annually	Habitat suitability reports	KFE - RS	None
<b>Threat:</b> Invasive plant species	% area of glades under invasive plants	Permanent sample plots	Annually	Habitat suitability report	KFE - HB	None
<b>Threat:</b> Overgrazing	No. of excess Livestock in forest per time	<ul style="list-style-type: none"> <li>▪ Analysis of data on grazing from KFS Occurrence Books</li> <li>▪ Permanent sample plots</li> </ul>	Annually	<ul style="list-style-type: none"> <li>▪ KFS / KWS occurrence books</li> <li>▪ Habitat suitability report</li> </ul>	KFE – RS	None
<b>Conservation Target 6: Bush viper</b>						
<b>KEA:</b> Population size and structure	Number of individuals and age, sex ratios	Ground count by point observation	Annually	Fauna Ground counts reports	KFE - RS	Partial
<b>Threat:</b> Poaching	Number and	Analysis of incidences	Quarterly	KWS	KFE - RS	Yes

<b>KEA/Threat</b>	<b>Indicator of change</b>	<b>Method of measurement</b>	<b>Collection frequency</b>	<b>Data source</b>	<b>Responsibility</b>	<b>Data currently collected</b>
	frequency of incidences	from KWS Occurrence books		Occurrence books		
<b>KEA:</b> Optimal population size, recruitment and structure	Number of individuals and age, sex ratios per area	Ground count and distribution mapping	Annually	Fauna Ground counts reports	KFE - RS	Partial
<b>KEA:</b> Habitat availability and quality <b>Threat:</b> Habitat loss	Quantity and quality of preferred Vegetation type	Transects to establish Size and structure of forest habitats	Annually	Vegetation monitoring reports	KFE – RS/ collaborating institutions	Partial
<b>Conservation Target 8: Chapin’s Flycatcher</b>						
<b>KEA:</b> Population size and structure	Number of individuals	Population surveys	Annually	Avifauna survey reports	KFE – RS/ collaborating institutions	No data is available
<b>KEA:</b> Habitat availability and quality <b>Threat:</b> Habitat conversion	Area under forest catchment	Analysis of satellite images and aerial photos	Every 5 years	Land cover changes report	KFE Research station//Consultant /KFS	No data is available

# Tourism Development & Management Programme

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## Programme Purpose and Strategy

To develop high quality, low impact tourism based on the unique biodiversity and culture that offers a memorable visitor experience

The tourism industry in Kenya is a prime foreign exchange earner, which plays a significant role in economic development of the country. The importance of tourism in Kenya is reflected in the spirited efforts by the government to develop the industry, which is also envisioned in the Vision 2030 as a leading sector in the realization of the Vision objectives. Kenya aspires to be among the top ten leading tourist destinations in the world, offering a sophisticated, diverse, and unique visitor experience to outshine the competition. It is therefore paramount to ensure that the optimum tourism potential of the KFE is realized in order to contribute to the achievement of Vision 2030.

Kakamega Forest is recognized globally for its biodiversity which makes it a key tourist attraction. It is best known for its diversity of birds, with a record of 388 species of which 36 are endemic to the ecosystem. Additionally, it is home to the most conspicuous mammals, which include six species of primates (Red-tailed Monkeys, Blue Monkeys, the Black and White Colobus Monkeys, the Potto, and the rare de Brazza's Monkeys); small antelopes such as Duikers; and small carnivores such as the Egyptian Mongooses, African Civets, Servals, and Genets. KFE further supports a wide variety of butterfly species, for example, the Regal Swallowtail, the Black-tipped Diadem and the Forest Mother of Pearl. Reptiles in KFE include lizards, skinks, chameleons, and 36 snake species. The Kakamega Forest is endowed with spectacular flora as well, with a record of 160 tree and shrub species, 170 herb species, 62 fern species and a wide variety of flowers, all of which make a radiant view, particularly during the wet season.

Further, KFE is encircled by the Abaluhya community that is renowned for its diverse and appealing culture; hence there are various opportunities for tourists to enjoy the local culture exhibited in varied forms. There is an interesting correlation between culture and biodiversity conservation, whereby enduring beliefs relating to certain species are known to have significantly contributed to their preservation.

In addition, there are prominent accommodation facilities within KFE which include the following: the Udo's Bandas, Udo's Campsite and Isikuti Guest House in Kakamega National Reserve; the Isecheno Forest Guest House, Rondo Retreat, KEEP Bandas and Isecheno Campsite situated in Isecheno; the De Brazza's Campsite at the periphery of Kakamega National Reserve; and the Golf Hotel in Kakamega town. In total, these facilities have approximately 376 beds, but they remain in great need of improvement.

The existing information indicates that both KFS and KWS received 3,830 visitors in 2008 and 5,754 in 2009 from KFE. Revenues from tourism in the KFE for the two organizations totalled Kshs. 1,995,700 in 2008 and Kshs. 4,182,250 in 2009. Based on these statistics, it is clear that visitation levels are quite low compared to other tourist destinations in Kenya. Nevertheless, the government's commitment to promote the Western Tourism Circuit over the past two years is

commendable, since previously there had been minimal effort to promote this region as a tourism destination.

This plan lays out actions that will be undertaken by the KFE management in the next 10 years to enhance responsible tourism in the area, promote tourism benefits to local communities and economies, as well as minimize the negative impacts on the environment and culture.

## Guiding Principles

The guiding principles which will underpin the implementation of this programme have largely been drawn from the following policies:

- ▶ Kenya Vision 2030
- ▶ Ministry of Tourism - Tourism Sector Medium Term Plan (2008 – 2012)
- ▶ KWS Tourism Product Development Strategy, 2005 – 2009
- ▶ KWS Facilities Development Process, 2005
- ▶ National Tourism Policy Framework, 2003
- ▶ National Tourism Development Master Plan, 1995
- ▶ KWS Tourism Development Plan and Strategy, 1995
- ▶ The Forests Act, 2005
- ▶ KWS strategic Plan 2009-2013
- ▶ Kenya Forest Strategic Plan 2009/10-2013/14
- ▶ The Wildlife (Conservation and Management) Act, 1989

***The key principles, which should guide the implementation of the Tourism Development Programme over the next 10 years and the achievement of the programme purpose, are set out below.***

### **Tourism is developed in a responsible and sustainable manner**

Sustainable development is defined as development that meets the needs of the present without compromising the ability of the future generations to meet theirs; therefore in line with this principle, the corresponding force in tourism has been to restrict developments only to those forms of tourism that maintain the environmental, social and economic integrity and well being of natural, built and cultural resources in perpetuity. The same outlook will be adopted in all tourism developments in KFE, which will include making certain of the following: that all developments have the least impact on the environment; that all relevant legislation is adhered to when planning, implementing, operating or decommissioning tourism developments; that appropriate education and information is provided to all parties including visitors, local communities, the government, and non-governmental organizations, among others; that carrying capacities and limits of acceptable use of various resources are established and adhered to; that local cultures are respected and protected; and that guidelines, codes of conduct, rules and other tools are developed and disseminated, to govern access and use of various tourism resources.

### **Tourism support infrastructure is developed and maintained**

The current tourism infrastructure in Kakamega is inadequate, while some tourist facilities in the ecosystem are in a deprived state. Tourism is outlined as one of the six key drivers for achievement of the Kenya Vision 2030, hence it is imperative that a thorough improvement of

the sector is undertaken. According to the Kenya Tourism Sector Master Plan (2008-2012), the existing facilities and infrastructure in under-utilized protected areas such as the KFE will be rehabilitated and expanded. This will include improving and expanding the current bed capacity. In the ten year plan period, collaborative measures will be taken to attract new investment to the KFE (including advertising tourist attractions in protected areas), increase the bed capacity in the ecosystem and improve on the tourism infrastructure to offer high quality service. In effect, one of the country's specific goals for 2012 is to increase hotel bed capacity from 40,000 to at least 65,000, combined with an emphasis on first-class service.

## **Cultural tourism is promoted**

Cultural safaris to Kenya are very popular among travellers who yearn for a better understanding of the diverse Kenyan culture. These safaris accord visitors the chance to interact with the indigenous communities, thus the outside world gets to understand Kenya's diverse culture through these safaris.

The KFE adjacent community has a rich cultural heritage which has recently received substantial publicity in the local and international media. The Luhya are nationally renowned for their energetic and vibrant *isukuti* dance, a celebratory performance involving rapid squatting and rising, accompanied by thunderous and rhythmic drumbeats. Moreover, traditional bullfighting is still considered a sport among sections of the Luhya community. The annual bullfighting competition attracts many spectators. Further, the Luhya cuisine mainly comprised of chicken, which is at times boiled using traditional herbs, usually attracts thousands of visitors to the region.

The involvement of the local community in the KFE tourism initiatives will therefore be encouraged whenever possible, as this has the potential to increase direct benefits to KFE adjacent communities. Hence this programme will support initiatives geared towards enhancing cultural tourism in the KFE.

## **KFE tourism product is diversified**

In addition to being Kenya's only sub-tropical rainforest, KFE contains a wide variety of both lowland and highland species of flora and fauna. It is well established as a rich biodiversity zone, therefore emerging as an attraction to not only general interest tourists, but also different special interest groups, for instance, ornithologists (bird watchers), entomologists (who study insects) and herpetologists (reptiles). This unique character of the forest should be fully exploited during the marketing and promotion of tourism in the region.

## **Tourism development promoted and marketed in an integrated and unified manner**

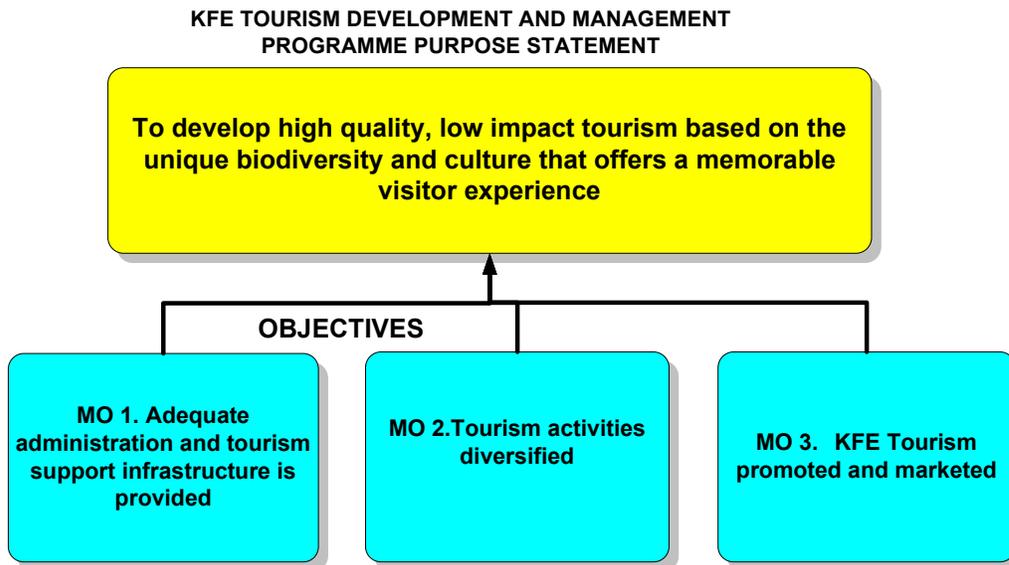
KFS and KWS have jointly developed this 10-year management plan aimed at fully addressing management issues to ensure KFE's ecological integrity is maintained. However, over the past years the two management units have placed major emphasis on their own areas of jurisdiction, thus neglecting ecosystem-wide tourism development. As an example, the Kakamega National Reserve has developed its own marketing materials such as reserve infrastructure map, guide books, brochures and posters, while excluding the KFS managed forests. Hence, this programme will aim to promote and market KFE as a single tourism destination. In regard to this,

KWS & KFS will jointly develop and disseminate promotion and marketing materials that cover the entire KFE.

## Management Objectives

Figure 6 below shows the overall objectives tree for the KFE Tourism Development and Management Programme.

**Figure 6. KFE Tourism Development and Management Programme**



### Objective 1: Adequate administration and tourism support infrastructure is provided

The future desired state at KFE is a setting where infrastructure to support management and development of sustainable forest-based tourism is adequately developed and maintained. Currently, Kenya's tourism products are being aggressively marketed both locally and internationally, particularly ecotourism which is a great potential of KFE. These efforts fall within the framework of Kenya's strategic development blue print Vision 2030, which seeks to increase tourism in under-utilised protected areas. Such an increase calls for commensurate expansion and maintenance of visitor accommodation facilities, as well as the diversification of tourist activities in order to provide the ultimate visitor experience. At the KFE, tourism infrastructure is inadequate and as such it cannot support the expected increase in visitation. As a result, this objective has been designed to ensure that tourism infrastructure to support the development of sustainable ecotourism in the KFE is developed and maintained. The management actions to be implemented in relation to this objective will focus on strengthening of institutional collaborations for KFE, which is paramount towards attainment of the overall purpose of tourism development in the ecosystem, as well as liaising with and supporting other stakeholders (tour operators,

hoteliers, community tourism groups and government agencies responsible for tourism development) in the development and implementation of specific integrated tourism activities for the KFE.

**Action 1.1: Identify tourist facility sites for possible concession**

Tourism investors play a critical role in conservation of ecosystems by providing employment to local communities and support to local entrepreneurs who provide goods and services for their clients. The visitor use zonation and accompanying accommodation prescriptions allow for the development of a significant number of new tourism accommodation facilities in the Low Use, Focal Visitor Area, Low Use Zones and Wilderness Zones during the ten-year plan period. However, given the nature of KFE and the need to maintain the ecological integrity of the forest ecosystem, a proactive approach towards the development of appropriate tourism investment is necessary, especially to encourage tourism development across the ecosystem.

The potential areas under consideration for concession include the region along the Yala River but not within the Yala River Nature Reserve, the Isecheno Nature reserve at Kalunya glade, the Buyangu Low Use Zone, Focal Visitor Area near Isiukhu falls and the Malava Low Use Zone. The essential considerations during concession will include the presence of linkages with the local community and the type of incentives for developers. Adequate education and awareness will be carried out to ensure that the local community is aware of this process and can participate at the appropriate time and place. Concession areas should also charge fees that reflect the opportunity cost of alternative land uses and the provisions of KWS and KFS on lease/ licence fees in this area. In addition, investors will be encouraged to hire land from the local community to utilize it for developing tourist facilities.

**Action 1.2: Review and harmonize criteria for assessing tourism concessions / licenses in KFE**

In the short-term, KFS and KWS shall review their existing criteria for assessing proposed tourism sites before evaluating the suitability of the concessions proposed in this management plan. In this, the institutions shall abide by the provisions of the Public Procurement and Disposal Act (2005) and the Environmental Management and Coordination Act (1999) including the requirement for successful investors to carry out an Environmental Impact Assessment (EIA) before they implement their projects. In the medium-term, the institutions shall establish an evaluation committee that will, among other things, harmonize criteria for assessing tourism concessions in KFE and review and advise on all sites proposed for concession in KFE in future. Additionally, a Tourism Prospectus will be developed to raise awareness and inform potential investors of the significant investment opportunities available in KFE.

**Action 1.3: Ensure connectivity for visitors across the KFE**

This management plan envisages the management of the KFE as an integrated ecological unit despite its management being shared between KWS and KFS. Tourism development and management will therefore be integrated across the various administrative units of the KFE. Currently, the forest blocks in the ecosystem are poorly linked by roads and trails making it difficult for visitors to access the KFS managed areas from the KWS managed National Reserve. To address this problem and ensure a seamless visitor movement across the forest

blocks, better connectivity will be established between these blocks. To achieve this function, a foot bridge will be constructed at Isiukhu River to restore connectivity between the national reserve and the Kakamega forest block. Additionally, a swinging bridge will be constructed across the Yala River to connect Yala Nature Reserve and Kibiri Forest Block. Trails will also be created to link Isecheno and Kibiri forests. Further, entry gates will be established at Ikuywa and Isecheno to facilitate access to the forest.

### **Action 1.4: Support community participation in KFE tourism**

In KFE, some community members have formed organized groups to practice ecotourism as an economic venture. There is however high potential for communities to participate in tourism activities ranging from: establishing tourism accommodation facilities, offering guided walks, establishing cultural centres and curio shops, offering various aspects of culture (traditional rituals, ceremonies, medicinal plants, etc) as tourism products, offering home stays, and volunteer tourism, as discussed in Action 2.2 below. As a result, KFE management will work closely with these groups to foster the activities of organized groups such as KEEP. To do this, KFE management will be organizing seminars/workshops on annual basis and invite speakers to educate the groups on different aspects of establishing and running tourism enterprises. KFE management will also be organizing regular meetings with leaders of such groups to discuss tourism issues that may arise. All these activities will be geared towards empowering the communities to participate in tourism development for livelihood improvement.

The following community driven projects will be supported outside the protected area:

- ▶ construction of 10 extra Bandas by KEEP in community land next to the snake park; and
- ▶ Establishment of a campsite by the community living adjacent to Kisere forest.

### **Action 1.5: Rehabilitate and ensure regular maintenance of tourism facilities**

The increasing levels of visitor use have begun to wield a negative impact on the environment around tourist attractions and facilities, which has increased the need for new or upgraded visitor facilities and amenities. This management action aims to address this issue to ensure that existing tourism facilities meet the appropriate visitor and environmental standards and regulations laid down by pertinent organizations.

Currently, the most urgent activity is the environmental audit of Isecheno Guest House and Udos bandas. In addition, further activities on specific improvements will be required, which include:

- ▶ rehabilitation of Isecheno Guest House;
- ▶ providing clear signage, naming and descriptions of facilities and nature trails;
- ▶ developing a database of nature trails and tourist facilities and recording different species, attractions and monitoring changes to reduce negative impacts;
- ▶ regular maintenance of existing nature trails; and
- ▶ improving waste disposal and sanitation.

**Action 1.6: Relocate inappropriately sited facilities in the ecosystem**

There is need to regulate the development of additional structures in the KFE based on the zonation scheme. Additionally, it is felt that the positioning of the following facilities should be reviewed:

- ▶ Udos bandas and the Udo campsite are located in the same place. This proximity of a public campsite to a Banda creates congestion and mixing of different visitors, which is not well received by the guests at the Bandas. For this reason, Udos public campsite will be relocated 200m away from the bandas to a site close to the caretaker’s house.
- ▶ Isecheno Guest House, KEEP Bandas and Isecheno campsite are also found in the same location, but in this case it is not prudent to relocate the KEEP Bandas and Isecheno Guest Houses as they are permanent structures. Hence Isecheno Campsite will be relocated next to the KEEP’s botanical garden and out of sight of the other facilities.

**Action 1.7: Conduct a study to establish the visitor carrying capacity to inform visitor management**

A study to determine the visitor carrying capacity at the KFE is necessary to support decision making regarding allowable levels of visitor use. Hence a study will be carried out and it will involve visitor surveys and will among other things establish tourism numbers and time limits for using different areas within the ecosystem, depending on the species in such areas and the nature of the impact from visitors. As an example, in Uganda’s Bwindi Forest Reserve, only eight persons are allowed to watch Gorillas at any one time and this time is limited as well. In addition, studies on animal behaviour and their habitat requirements need to be carried out to establish the impact of visitors to wildlife especially in highly visited areas. The survey will also determine the types of facilities which can be set up in different areas, including their bed capacities. Clear limits should be put in place to cater for the anticipated increase in tourist numbers once the marketing is sufficiently improved. Finally, the study will avail clear monitoring and evaluation procedures, which will be done in consultation with the proposed Scientific Advisory Committee (Action 3.3 under the Ecological Management Programme).

## **Objective 2: Tourism activities diversified**

KFE has excellent potential for activities such as scenic drives, guided walks, bird and primate watching, scientific expeditions, hiking, and cultural tours among others. These activities are vital in attracting investment opportunities in the area. Hence this management objective has been designed to ensure that tourism activities are diversified to enhance visitor satisfaction. The management actions that will be implemented to achieve this objective are elaborated in the following sections.

**Action 2.1: Establish diverse visitor activities such as long and short walks, hiking, biking and canopy walks**

The KFE has a high potential for diversification of tourist activities and attractions. Most notably it comprises of a diverse network of nature trails which if properly sited through strategic signage

and interpretation materials, will boost visitor satisfaction. Hiking is an additional activity practiced in KFE at Buyangu and Lirhandanda hills, but the hiking routes remain in poor condition and are not clearly marked. Besides short and long walks, canopy walks is another activity that can be promoted in the indigenous closed canopy forests to catch panoramic views of the forest and Nandi escarpment.

Through this action therefore, KFE management will explore possibilities for establishing a standard walking route along with good sites for overnight stop overs. An ideal route could be from Isecheno in the south to Buyangu in the north giving visitors an opportunity to traverse the greater Kakamega Forest. In addition, the quality and experience of hiking will be improved through the provision of basic requirements such as steps for climbing, putting up visitor interpretation materials and a site map at the top of the hills, as well as providing information for the different scenes and sites visible from the hilltops. An ideal resting place will be put up at Lirhandanda hill for picnics.

Other visitor activities and attractions that will be promoted and marketed include the following: cultural activities, boating at Yala River, catch and release fishing, night walks at designated sites near tourism hotels inside the forest, and construction of a raised canopy tower at Kisere forest. In addition, biking will be introduced.

**Action 2.2: Support formation of a community organization to promote and enhance cultural tourism**

To understand and appreciate other cultures, it is necessary to have a direct interaction with them, and this is the true value of the tourism trade. Western Kenya is rich in culture, playing host to a number of tribal groups which include the Luhya, Luo, Kuria and the Gusii. Interacting with the villagers and listening to their folklore, or joining them in some traditional dances and having a bite of their fare are worthy cultural experiences. However, to fully develop and exploit opportunities presented by socio-cultural values in the area, the local community requires the support to establish a cultural group that promotes and coordinates culture-based tourism activities.

For this reason, it is through this action that support to the community will be provided in the form of capacity building for tourism promotion and marketing, as well as handling of visitors. In addition, KWS and KFS will fund the process needed to establish the cultural tourism organization. Some of the activities that the organization will be expected to participate in include: organizing village stays where visitors can experience the local culture, ceremonies and rituals; marketing locally owned accommodation facilities; and promoting cultural excursions, traditional dances, scenic safaris, walking safaris, camel safaris, filming and photography, game drives and bird watching.

**Action 2.3: Support the establishment of cultural centres**

The Luhya community has 17 sub-dialects with varying cultural practices. This outstanding cultural diversity is a potential tourist attraction which can be extensively marketed to benefit the KFE. Culture related tourism in KFE is currently low and usually involves visits to cultural Centres, which are included in the wildlife viewing tour package offered by tour operators. In order to obtain maximum benefits from the opportunities offered by the cultural experience, measures that take into consideration the interests of visitors as well as the respect for the

Luhya culture will be adopted. The community will be encouraged to construct cultural centres in various regions of the ecosystem. The moment these centres are established, a KFE Cultural Centre Association consisting of representatives from the existing cultural centres will be set up, in order to brand and set operational standards for the cultural centres, as well as liaise with tour operators and other stakeholders regarding pertinent matters on these centres.

In order to strengthen the capacity and efficiency of this association in developing and managing cultural tourism, the KFE management will ensure that:

- ▶ cultural centre operators are trained in various aspects of enhancing cultural tourism which include tourism product development, display of culture, and the delivery of quality service. They will be trained in management and governance issues as well, to ensure that the beneficiaries of these facilities are not exploited by visitors through acts that demean the community and its culture;
- ▶ members of the Luhya community display their way of life in its unadulterated form, which will involve promoting and supporting development of home stays; and
- ▶ cultural events and ceremonies such as bullfighting and circumcision will be promoted.

**Action: 2.4: Support development of Voluntourism in KFE**

Voluntourism is a form of travel experience that incorporates volunteer activities which give back to the host community. Voluntourism combines vacation travel with volunteering at the visited destination for a charitable cause. A well-organized and thoughtfully planned voluntourism process within KFE will benefit the community in diverse ways, given that the types of volunteer vacations are varied, from low-skill work such as construction to high-skill medical work. The other activity which can be promoted in KFE is engaging the volunteers in scientific research and education to promote the understanding and actions necessary for sustainable forest management. The participants will be required to cover a fee that would include expenses of their stay, and engage in projects based on their interest or location.

To promote voluntourism, KFE management will:

- ▶ liaise with existing travel clubs and tour operators in Kenya to link up organized community groups who would want to engage in this practice;
- ▶ build capacities of local communities to enable them to plan, develop and manage successful tourism enterprises and activities;
- ▶ support communities to develop guidelines, codes of conduct, regulations and other tools to promote responsible voluntourism; and
- ▶ advise and support the security operations that relate to community-based tourism.

**Action 2.5: Incorporate Corporate Social Responsibility (CSR) in tourism development proposals**

Corporate Social Responsibility is the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce, their families the local community and the society at large. Essentially, the concept of CSR involves businesses giving back to society. As discussed in another section of this management plan, there are a number of tour companies which own facilities within the KFE, thus from a business

perspective they benefit from the KFE. To a certain extent some of these companies practice CSR, but others have completely failed to honour their responsibility to society. While CSR is a voluntary approach adopted by a business enterprise in order to meet or exceed stakeholder expectations, it will be a requirement for any development proposal within the KFE to show how the community will benefit from such enterprises.

In regard to the existing enterprises, KFE will encourage them to establish trusts or foundations, through which funds donated by clients or allocated from their own profits, can be channelled to community projects. The funds will be used for different activities which include; supporting schools or educational scholarships, and enhancing access to water or fuel supplies, among others. These projects could address immediate community needs around the KFE, in addition to enhancing the support for conservation, marketing tourism facilities and contributing towards ecotourism certification. As a first step towards addressing this issue, KFE managers will raise awareness among tourism operators on the importance and potential benefits of incorporating social responsibility in their operations.

As part of this process, it is important to ensure that benefits received are clearly connected to the conservation of KFE and do not undermine traditional cultures around the ecosystem. Alongside these projects the KFE managers will also encourage operators to employ local people whenever possible. The KFE management will also raise awareness among facility operators on the availability of local produce (grains, fresh fruits, meat and vegetables) around the KFE and enhance the linkages and the supply of this produce to tourism facilities or their staff.

### **Objective 3: KFE Tourism promoted and marketed**

The tourist visitation rates at the KFE have been quite low over the past years compared to other conservation areas in Kenya. Moreover, domestic tourism in the region has been very low despite its high potential due to its proximity to Kakamega town, and no more than 50 Km from Kisumu City. In consideration of the fluctuation in the international tourism market, it is important that the domestic tourism market is wholly exploited to ensure sustainable tourism development in the KFE. In addition, there is need to develop a common marketing strategy that extensively covers the entire ecosystem, since at present only the Kakamega National Reserve and its associated tourism resources has received significant marketing. The development of appropriate and conservation-compatible visitor attractions in the ecosystem has the potential to enhance the KFE visitor experience by increasing the diversity of the tourism products, providing opportunities for enhancing visitor understanding and appreciation of the exceptional resources of the ecosystem, and in many cases, providing a much needed opportunity for visitors to spend time out of their vehicles.

This objective aims to promote the Kakamega Forest Ecosystem locally and internationally to ensure the rise in conservation-compatible visitation. The management actions designed to achieve this objective focus on developing and marketing existing and new tourism products and services targeting specific tourism markets, marketing the ecosystem through the media and special events, as well as expanding tourist information and promotion materials. These management actions are elaborated in the sections below.

**Action 3.1: Develop a KFE tourism marketing strategy and link it with the Western Tourism Circuit (WTC) strategy**

The western tourism circuit is inadequately marketed though it has the capacity to attract high value international and domestic tourists. The current marketing process of the KFE is carried out by different entities, employing their own strategies including websites. As a result, KFE is neither recognized as a strong brand nor does it command a strong web presence. A marketing plan for KFE that incorporates a strategy to identify the different market segments and the most effective promotional strategies will therefore be required. Therefore, under this management action a unified marketing strategy for the entire KFE which is tied to the WTC strategy will be developed. Consequently, a team composed of the following persons will be formed to steer the development of this strategy:

- ▶ 2 KWS officers KFE;
- ▶ 2 KFS officers KFE;
- ▶ 2 officers, each from KWS and KFS headquarters (Tourism Department);
- ▶ 1 officer from WTC; and
- ▶ 3 representatives from the Tourism industry (KTF, ESOK, Kenya Association of Hotel and Caterers).

The team will be coordinated by the Warden of the KNR in consultation with the KFS Head of Western Conservancy. The team will develop a common website for KFE which will be linked to respective KFS and KWS websites as well as the WTC website.

**Action 3.2: Intensify marketing campaigns for KFE through the local and international media**

Although the Kakamega Forest Ecosystem has been covered by several local and international media, the message has mainly centered on scientific purposes rather than promotion of tourism. This forest resource has been inadequately advertised in the media despite its rich diversity of flora and fauna in addition to a rich culture, particularly the famous bull fighting. To ensure that tourism resources in the forest ecosystem are widely known by potential visitors, KFE management will solicit local and international media coverage of the forest's activities such as cultural events, habitat restoration and research activities. In addition, KFE will collaborate with key stakeholders (researchers, community and tour operators) to ensure that at least two television interviews, two radio interviews, five newspaper articles and one magazine article are produced annually.

Efforts have been made by KWS to market the forest ecosystem through the KWS website, but there is a setback, in that the website has mostly targeted the KNR, and barely covers the entire ecosystem. Furthermore, the web content is shallow and does not display tourism resources and opportunities within the ecosystem in a manner that adequately creates a continuous interest in the ecosystem. In order to ensure sufficient marketing of the KFE, and in liaison with Action 3.1 above, a common website will be established, which will be enriched through the provision of updated and relevant information solicited from other stakeholders in the KFE.

### **Action 3.3: Ensure regular update of the KFE tourist guidebook and map**

Tourist maps and guidebooks are very important in promoting tourism resources within a tourism destination. They provide the much needed information on the items on offer, where they can be found, and how to get there. Furnishing the visitor with adequate information helps to foster the understanding of tourism products, thus enhancing visitor experience and satisfaction. A guidebook and tourist map have been developed for Kakamega National Reserve in the north, while a newer version of the guidebook and tourist map on the entire ecosystem has been developed, though there is need for regular updates to capture any new developments within the KFE. Hence, these tourist information resources will be updated regularly during the plan period and they will highlight cultural as well as natural resources that can be enjoyed both inside and outside the KFS and KWS managed units. Additionally, they will encourage visitors and tour operators to venture into community areas, hence spreading tourism benefits. The tourist map and guidebook will be availed to all stakeholders through the KFE Biodiversity Information Centre.

### **Action 3.4: Participate in Agricultural Society of Kenya (ASK) shows and hold special events to promote tourism in the KFE**

To promote and market KFE to the general public, KFE staff will be participating in appropriate local and national environmental awareness events aimed at raising awareness about the forest ecosystem and its exceptional resource values. In this regard, KFE management will ensure that a stand is secured during the ASK shows which take place on an annual basis in Kakamega town. It is through such an avenue that KFE will be marketed and promoted extensively. Apart from the ASK shows, KFE will be represented in other local and international tourism fairs and exhibitions whenever possible. A number of special events that attract the attendance of both local and international visitors, such as cycling in the forest, will also be initiated, especially in commemoration of special dates, like the gazettelement of the Kakamega Forest, or any other significant date. For this reason, under this management action a KFE cycling competition will be organised annually, where locals can compete in an effort to conserve the forest ecosystem and promote tourism.

### **Action 3.5: Promote and support domestic tourism**

Kenya has currently embarked on a new campaign to sensitize Kenyans on the significance of domestic tourism. The initiative is part of a tourism recovery strategy spearheaded by the National Tourism Crisis Management team which was set up to mitigate the effects of the 2007 post election unrest that saw international tourism drop to a record low. As a result, a new domestic tourism logo "*Tembea Kenya*" (Visit Kenya) and website were unveiled in March, 2008 to a gathering of industry stakeholders and the media. The launching of the new logo was aimed at giving domestic tourism a corporate identity that is unique and will gradually become a familiar trade mark around the country. KFE should take advantage of this initiative to promote domestic tourism in the forest, which has been very low despite the potential it holds. In order to promote domestic tourism, KFE will initiate the use of bus shuttles that will be ferrying visitors to the forest ecosystem similar to other protected areas such as the Nairobi National Park. The other market segment of domestic tourism to be exploited by KFE is the educational market. This is based on the high visitation to Kakamega Forest by students from different learning institutions from all over the country. The educational market is however weighed down by lack of suitable and

affordable accommodation facilities for students within the ecosystem. There is significant room to grow this market if student hostels are provided for organised school groups. As a result, through this action, two student hostels will be constructed in the Low Use Focal Visitor Area, one on the northern side and the other on the southern side. In addition, domestic tourism will be marketed through the common websites proposed under Action 3.2 above and linked to the national domestic tourism website under the Ministry of Tourism.



Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.2.6 Invite proposals from potential interested investors in accordance with the information provided in the Tourism Prospectus.														
1.2.7 Conduct a detailed EIA for proposed projects in accordance with EMCA (1999) regulations.														
<b>1.3: Ensure connectivity for visitors across the KFE</b>														
1.3.1 Construct a foot bridge at Isiukhu river	Warden, ZM, AD-WCA, HoC													Two bridges, two gate, two long trek trails constructed by June 2015
1.3.2 Construct a gate at Ikuywa and Isecheno														
1.3.3 Identify and develop long trek trails that connects the southern (Isecheno) to the northern side (Buyangu), Isecheno to Kibiri														
1.3.4 Enhance security for long trek visitors by providing armed escort and regular mobile patrols														
1.3.5 Construct a swinging bridge across Yala River to connect Yala Nature Reserve and Kibiri Forest Block														
1.3.6 Identify a committee amongst tourism stakeholders to come up with modalities for harmonizing rates for visitors crossing the KWS-KFS boundary														
1.3.7 Develop new rates that are agreed upon for use by the two institutions														
1.3.8 Seek the inclusion of the new rates in the KWS-KFS MoU that is being developed														
1.3.9 Adopt and implement the new rates														
<b>1.4: Rehabilitate and ensure regular maintenance of tourism facilities</b>														
1.4.1 Open nature trails in Isecheno, Ikuywa and Buyangu in reference to previous research work.	Warden ZM, CFAs													Existing facilities rehabilitated and maintenance ensured on annual basis
1.4.2 Rehabilitate and lease out Isecheno Guest House.														
1.4.3 Erect clear signages for facilities, roads and nature trails and ensure their maintenance														
1.4.4 Develop a KFE database for nature trails and tourist facilities attractions														

**TOURISM DEVELOPMENT & MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons Responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.4.5 Construct resting benches with shades along nature trails														
1.4.5 Identify appropriate site for establishing a campsite outside the Kisere National Reserve for the Kisere Community.														
<b>1.5: Relocate inappropriately sited facilities in the ecosystem</b>														
1.5.1 Relocate Udos public campsite to 200m away from the Udos bandas to avoid visitors mix up and congestion	ZM, Warden, KEEP													Three wrongly sited facilities relocated and further development stopped
1.5.2 Retain Isecheno Guest House and KEEP Bandas in one place and avoid further construction of other extra in the same place.														
1.5.3 Relocate Isecheno campsite next to the KEEP's botanical garden, an area that is concealed from the other facilities.														
<b>1.6: Conduct a study to establish the visitor carrying capacity to inform visitor management</b>														
1.6.1 Develop ToRs for the visitor carrying capacity survey	ZM, Warden, H-BD&M, KFS HQs, AD WCA													Survey conducted by June 2015
1.6.2 Distribute the developed ToR and call for the Expressions of Interest (EOI) for consultancy services														
1.6.3 Conduct survey by the successful consultant														
<b>Objective 2. Tourism activities diversified</b>														
<b>2.1: Establish diverse visitor activities such as long and short walks, hiking, biking and canopy walks</b>														
2.1.1 Identify and develop appropriate nature trails for establishment of a standard walking route with good sites for overnight stop overs.	KWS HQs, KFS HQs, ZM, Warden													New tourism activities and attractions initiated and operationalized by June 2015
2.1.2 Provide basic requirements along walking routes such as steps for climbing, visitor interpretation materials and a site map at the top of the hills and information for the different scenes and sites visible from the hilltop														
2.1.3 Construct an ideal resting place at Lirhanda hill for picnics.														

Management Action and Activities	Persons Responsible	Timeframe												Milestones	
		FY 2012-13				FY 2013-14				FY 2014-15					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.1.4 Introduce tourism diversification activities such as: cultural activities, boating at Yala River, catch and release fishing, night walks at designated sites near tourism hotels inside the forest and biking inside the forest															
2.1.5 Construct a raised canopy tower at Kisere National Reserve															
<b>2.2: Support formation of a community organization to promote and enhance cultural tourism</b>															
2.2.1 Link up with NICE (Nature and Inter-Cultural Expeditions), to initiate Indigenous Tourism	ZM, Warden, H-BD&M, CFA, H-Enterprise Development, NMK														Communities organized and embracing cultural tourism
2.2.2 Create awareness on the potential of Indigenous Tourism															
2.2.3 Encouraged construction of cultural Centres in various regions of the ecosystem															
2.2.4 Create capacity for local community in tourism promotion and marketing, as well as handling of visitors															
<b>2.3: Support the establishment of cultural centres</b>															
2.3.1 Encouraged and assist the community to construct cultural centres in various regions of the ecosystem	ZM, Warden, H-BD&M, CFA, H-Enterprise Development, NMK														Five cultural centres established and the Cultural Centre Association formed by April 2013
2.3.1 Facilitate the creation of a KFE Cultural Centre Association (KCCA) consisting of representatives from the existing cultural Centres															
2.3.2 Assist the KCCA to set operational standards for the cultural Centres															
2.3.3 Link the created cultural centres with Tour Operators															
2.3.4 Train Cultural Centre operators in various aspects of enhancing cultural tourism															
2.3.5 Promote cultural events and ceremonies such as bullfighting and circumcision															
<b>2.4: Support development of Voluntourism in KFE</b>															
2.4.1 Build capacities of local communities to enable them embrace the voluntourism concept	ZM, Warden, H-BD&M, CFA, H-Enterprise														Voluntourism concept adopted and 15 homes identified and
2.4.2 Identify existing and operational travel clubs															

**TOURISM DEVELOPMENT & MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons Responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.4.3 Liaise with existing travel clubs and tour operators in Kenya for potential operations in KFE	Development, Provincial administration													vetted
2.4.4 Support communities to develop guidelines, codes of conduct, regulations and other tools to promote responsible voluntourism.														
2.4.5 facilitate identification of potential homes for promoting homestays														
2.4.6 Liaise with security operation agencies to enhance security that relates to community-based tourism														
<b>2.5: Incorporate Corporate Social Responsibility (CSR) as a requirement in tourism development proposals</b>														
2.5.1 Approach companies/organizations operating in KFE to embrace CSR	KWS HQs, KFS HQs, ZM, Warden													All organizations and NGOs, Hoteliers, Timber industry operating in KFE have a CSR component by Dec 2012
2.5.2 Encourage them to establish trusts or foundations, through which funds from willing clients (donations) can be channelled or their own profit														
2.5.3 Incorporate a CSR component while developing EOI/TOR for concessions														
<b>Objective 3: KFE Tourism promoted and marketed</b>														
<b>3.1: Develop a KFE tourism marketing strategy and link it with the Western Tourism Circuit (WTC) strategy</b>														
3.1.1 Establish a team to steer the development of the strategy	KWS HQs Marketing officer, KFS HQs, ZM, Warden													KFE Marketing Strategy report developed by September 2013
3.1.2 Develop a TOR for the team and timelines														
3.1.3 Operationalize the strategy														
3.1.3 Publicize the developed strategy both locally, nationally and internationally														
<b>3.2: Intensify marketing campaigns for KFE through the local and international media</b>														
3.2.1 Solicit regular local and international media coverage of the forest's activities	KWS HQs, KFS HQs, ZM, Warden													Two television interviews, two radio interviews, five newspaper articles and one magazine article are produced
3.2.2 Collaborate with key stakeholders to include KFE affairs in their marketing endeavours														

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.2.3 Market KFE tourism resources through the proposed BIC website (See Action 3.2) and link to other key stakeholder websites														every year.
3.2.4 Liaise with KWS, KFS headquarters for updating existing website that includes current KFE affairs														
3.2.5 Conduct periodic one-on-one tourism camps at strategic places in urban centres within the ecosystem														
<b>3.3: Ensure regular update of the KFE tourism guidebook and tourism map</b>														
3.3.1 Avail the latest version of the guidebook and tourism map to key stakeholders	BIC Officer ZM, Warden													
3.3.1 Encourage KFE stakeholders to keep availing relevant information for regular updates														
<b>3.4: Participate in Agricultural Society of Kenya (ASK) shows and hold special events to promote tourism in the KFE</b>														
3.4.1 Ensure that a stand is secured during the ASK shows that takes place on annual basis in Kakamega town	AD WCA, Warden Tourism, ZM Community Warden, Forester, CFA													KFE is represented in all ASK shows and takes chances to showcase during any opportunistic event in the region
3.4.2 Market KFE whenever an opportunity arises, e.g. tourism exhibitions, trade fairs														
3.4.3 Establish an in-house committee to deliberate on a possible KFE special event and come up with an appropriate name of the event														
<b>3.5: Promote and support domestic tourism</b>														
3.5.1 Take advantage of the 'Tembea Kenya Initiative' to promote domestic tourism	Warden Tourism, ZM Community Warden, Forester, CFA													Increased domestic visitation by 60% annually
3.5.2 Initiate the use of bus shuttles that will be ferrying visitors to the forest ecosystem														
3.5.3 Exploit the educational market though organizing talks, participation in environmental clean ups, ecological monitoring and others.														
3.5.4 Designate special offer visits														

# Forest Resource Management Programme

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## Programme purpose and Strategy

To conserve and protect the KFE natural forest and its rich biodiversity, and establish/maintain forest plantations, for sustainable use of forest resources and services in collaboration with KFE stakeholders

The Kakamega Forest Ecosystem is a tropical rainforest which provides a unique sanctuary for a wide variety of endemic flora and fauna. Approximately 10 to 20% of the animal species in the forest are unique to this forest. It is also an important watershed for some of the rivers that flow into Lake Victoria. The forest is invaluable to the people living around it, as a source of income and subsistence through products such as timber, fuelwood, herbal medicines, pasture, building materials and food. However, much of the outer part appears to have been a mosaic of woodland, grassland and forest patches.

The demand for timber, pole wood, fuel wood, pulp and paper raw materials is high in this region and cannot be sustained from the indigenous forest. Plantations were therefore established to relieve pressure on the indigenous forests. The annual planting programme covers approximately 240 ha for plantations and 160 ha for natural forests with an existing plantation area of about 2183 ha. To promote efficient establishment of plantations in collaboration with communities, the Plantation Establishment Livelihood Improvement Scheme (PELIS) has been introduced. The main activities in plantation establishment include site preparation, pegging out (staking out), transport of plants, planting, fertilizer application, beating up (Gap filling, in-filling), weeding, climber cutting, thinning and pruning, among others. The major plantation species have been the *Cupressus lusitanica*, *Maesopsis eminii*, *Pinus patula*, *Bischoffia javonica* and *Eucalyptus* species.

The main challenge facing KFE is the relatively high demand placed on it by the dense human (over 600/km<sup>2</sup>) and high livestock population in the areas surrounding it. This has led to fragmentation of the forest, thus affecting the biodiversity and consequently endangering the ability of the forest to regenerate itself. The resulting threats include the following; overgrazing, excessive fuel wood collection, illegal charcoal burning in areas such as Shamiloli and Ikuywa, encroachment and illegal pit-sawing.

## Guiding Principles

The programme guiding principles describe key factors taken into account in the development of the programme and that which influence the way the programme is implemented in achieving the programme purpose. These strategic principles have principally been drawn from the following policies:

- ▶ Kenya Vision 2030
- ▶ Kenya Forest Master Plan - 1994
- ▶ Kenya Forest Service Strategic Plan 2009/10-2013/14
- ▶ Draft Forestry Policy Sessional paper No. 1 of 2007

- ▶ The Kenya Forest Act, 2005
- ▶ Wildlife Conservation and Management Act Cap 376
- ▶ Water Act 2002
- ▶ Environmental Management and Coordination Act 1999
- ▶ Global Forest Principles (GFP)

*The KFE Forest Resource Management Programme will strive to ensure that:*

**Conservation and sustainable management of forest resources is enhanced for environmental protection and economic growth through participatory forest management**

KFE natural forest acts as a home to a wide array of animal and plant species, including rare and endemic plants and animals. In regard to the global economy, it provides public goods in the form of ecosystem services such as carbon sequestration as well as a rich reservoir of research material.

The Forest Act of 2005 expanded the mandate of the Kenya Forest Service which includes recognizing the important role played by the community in forest management. Through this Act, the community is required to register a Community Forest Association with the Registrar of Societies that can enter into an agreement with the Director of Forests and participate in the management of a forest (Tables 13). Further, the Community Forest Associations have been empowered to nominate four representatives to the Forest Conservation Committee (FCC) which is responsible for articulating the desires, ideas and opinions of the people within the conservancy in all matters relating to the utilization and conservation of the forests. This institution will play a crucial role in curbing the loss of forest land to other land uses since the power to alter boundaries and de-gazette state forests has been removed from the Minister responsible for forests and spread among several institutions, among them the Kenya Forest Service Board, the public and the parliament.

**Table 13. Community Forest Associations in KFE**

<b>Block</b>	<b>CFA</b>	<b>No. of CBOs</b>
Malava	Malava	8
Kakamega	Muilesh (Municipality, Ileho and Shinyalu)	42
Bunyala	Bunyala	4
Kibiri	Kibiri	15

Proposed excisions for public good will be regularized or revoked in accordance to the policy guidelines being developed by KFS regarding facilities in forest areas. The community and other stakeholders are now increasingly involved in various activities in the forests. Many community forest associations will be signing Forest Management Agreements (FMA) with KFS which will see them rendering more support to forests like patrols, ecotourism development, protection, and forest rehabilitation activities. This approach to management is meant to ensure religious and cultural sites, traditional medicinal sources, water catchment and habitats for endemic and threatened species of flora and fauna are conserved. A general challenge to forest management is the acquisition of information and creation of standards that will enable the monitoring of sustainable forest management over time.

Encroachment of the reserve forests will be addressed to ensure sustainable forest management. Practices like livestock grazing will no longer be allowed but cutting of grass and carrying will be permitted in designated areas and will be guided by its suitability for such use. Resource utilization will be carried out in accordance with rights conferred by the FMA between CFA and the KFS in compliance with the provisions of the Forest Act, 2005. Rehabilitation of degraded lands will continue through enrichment planting and protection. Special emphasis will be placed on catchments and riparian areas.

## **The productivity of industrial forest plantations is maintained and enhanced to increase efficiency in wood utilization**

Forest industrial plantation development is a human intervention that deliberately encourages the planting and tending of trees as a crop to address (a) sustainable supply of high quality timber and wood products and (b) sustainable supply of wood products to forest based industries.

Plantation establishment in KFE like in the rest of the country has gone through a difficult period as a result of inadequate funding to the sector. In the early 1990's, the *shamba system* was stopped without an appropriate alternative for plantation establishment, maintenance and protection against game damage. All these activities were done by farmers as they tended their food crops during planting and weeding. This resulted in backlogs which currently stand at 1200 hectares. To overcome this backlog and to ensure successful establishment of plantations, a new approach referred to as Plantation Establishment and Livelihood Improvement Scheme (PELIS) has been introduced and is in the pilot stage at Bunyala forest station. Under PELIS, farmers have to be members of a registered and active Community Forest Association (CFAs). Modalities for Public and Private Sector involvement in Plantation Establishment and Management have been provided in the Forest Act of 2005 and further subsidiary legislation, The Forests (participation in sustainable forest management) Rules, 2009, provide guidance on how interested public and private sector institutions will be engaged in the management process, either through licensing, concession, contracting and/or joint agreement arrangements as appropriate.

Plantation establishment within KFE, like in the rest of the country has been dependent on a narrow choice of species mainly cypress, pines and eucalyptus. In addition, the existing plantations have been developed from a narrow genetic base reducing the quality of tree products raised. This challenge will be addressed in collaboration with KEFRI and other forest research institutions to provide adequate information on the growth of indigenous species for plantation purposes, and for a wide choice of exotic species and proper species-site matching.

As a result of the narrow range of plantation species adopted in the country, the standing plantations have been prone to pests and diseases. These include cypress aphid, pine woolly aphid and eucalyptus chalcid. However, no serious attack with extensive damage or loss has occurred. A monitoring and early warning system for pests and diseases will be set up to preempt any attacks/infestations.

For efficient production and utilization in wood based industries, all harvesting will be guided by felling and thinning plans. In accordance with the draft forest policy, industries will be developed through appropriate investment incentives that encourage efficient use of raw materials, efficient technologies and protection of the environment.

The establishment of a well-sited and efficiently run forest tree nursery is an important prerequisite for any plantation development programme. To this end, the following tree nurseries, have been established in KFE; Isecheno, Bunyala, Malava and Kibiri.

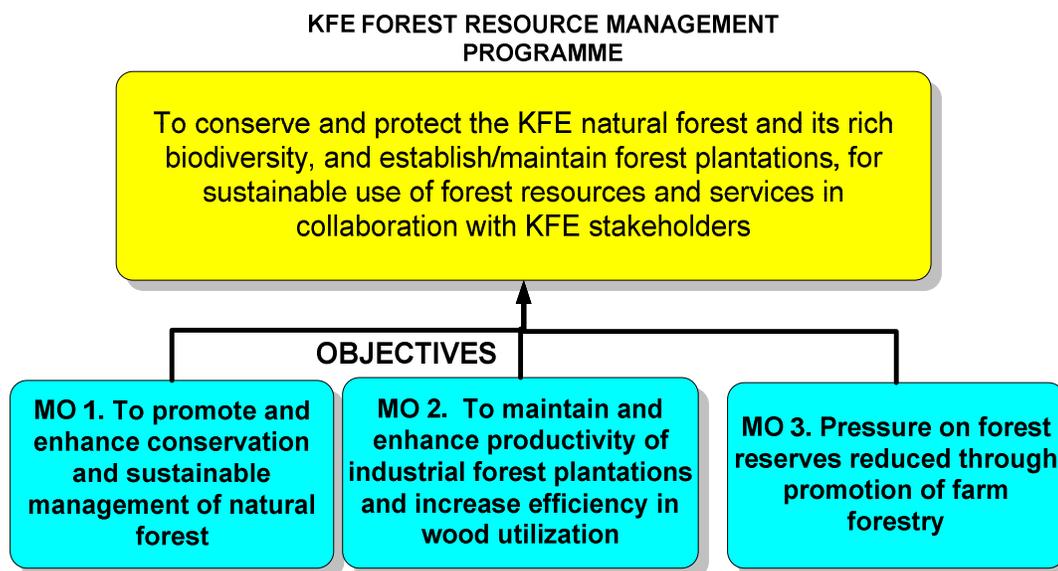
Over time it is anticipated that the funding for plantation development will increase based on higher revenue generated from improved management of plantations as well as levies and royalties charged for services such as water catchment services. The improved funding complemented by the role of the communities and other stakeholders through the PFM/PELIS arrangements will lead to more efficiently managed plantations.

These strategic principles are intended to guide the implementation of the Programme's three management objectives that, when taken together, achieve the Programme Purpose. These objectives are as shown in Figure 7.

## Management Objectives

Figure 7 below shows the overall Objectives Tree for the KFE Forest Resource Management Programme.

**Figure 7. Forest resource management programme Objectives Tree**



### Objective 1: To promote and enhance conservation and sustainable management of natural forest

There have been proposed strategies to protect and conserve the integrity of natural ecosystems to facilitate the continued provision of ecological services and values. Moreover, the rehabilitation of degraded sites is emphasized. Degradation negatively affects the structure,

functions, species composition and productivity of a natural forest, and also significantly contribute to micro-climate change. In relation to this problem, it is necessary to prioritize the implementation of actions such as enrichment planting, which enhance restoration of the forest to its initial natural state. This will involve lead agencies that will collaborate with other stakeholders in order to restore the forest cover through active tree establishment, protection and monitoring.

The plantation areas located within the indigenous forests will be harvested on maturity and replanted with indigenous tree species either through active planting or natural regeneration, while the indigenous forests within plantation forests will be maintained. The range of forest products include fuel wood, posts, poles, carving wood, timber, fodder, honey, herbs, moss and lichens, in addition to ecotourism. The harvesting of wood products has nevertheless been affected by the 1999 ban on logging from gazetted forests. In addition, harvesting from natural forests will no longer be permitted. Other issues surrounding wood harvesting include inadequate management guidelines for natural forests, lack of off-take levels for non-wood products and inadequate value addition strategies. Therefore, there is need for the development of management guidelines for natural forests, which would guide the off-take levels for non-wood products and value adding strategies.

The conservation of plant species of special concern is also recommended, though this process has been set back by inadequate information on the endangered and endemic species, as well as the weak enforcement of species protection leading to uncontrolled exploitation. The Kakamega forest ecosystem (KFE) contains a wide range of plant species of social and economic importance, with the following qualifying as vulnerable species; *Mondia whytei*, *Ficus thonningi*, *Fagara macrophylla* and *Maesopsis eminii*.

Natural Resource Assessment (NRA) needs to be undertaken to ascertain the status of the resources within the forest, since the degradation of forest cover has continually affected the production of forest goods and services. The monitoring process of forest resources has been hampered by lack of standardised NRA protocols and inadequate capacity. There is need for coordination of information, which guides management and decision-making. The NRA may include biodiversity surveys and biomass assessments, among others, while employing participatory processes.

### **Action 1.1: Rehabilitate degraded forest sites**

There is increasing evidence that forest rehabilitation and restoration are technically feasible through silvicultural interventions in degraded tropical forests and lands. The term “forest rehabilitation” herein refers to reforestation and other related techniques like assisted natural regeneration, with the goal of re-establishing the original forest cover with native tree species. Currently, degraded areas in KFE cover about 4061 ha. KFS will collaborate with other stakeholders to rehabilitate the forest to its natural or near natural state through active planting of suitable indigenous tree species and protection of natural regeneration.

In areas invaded by undesirable species such as the *Psidium guajava* (guava), clearing of the plant will be necessary followed by planting of the indigenous species, while incorporating spot weeding to ensure the planted seedlings are not overwhelmed. The natural ecosystem requires protection against illegal entry, non-prescribed fire, pests and diseases, through monitoring and constant inspection as well as clearing of the fire breaks.

### **Action 1.2: Promote sustainable utilisation and conservation of wetlands**

Wetlands are rich ecosystems, which perform critical ecological functions and provide essential livelihood products and services. The most significant wetland functions include groundwater recharge and discharge, flood and erosion control, sediment/toxicant retention (purification), nutrient retention, microclimate stabilization, water transport and recreation. Some of the products derived from wetlands include forest products, wildlife resources, and fisheries. Wetlands are habitats for biological resources and serve as feeding, spawning and refuge sites for a number of migratory birds. In addition, they serve as unique cultural functions in some places.

However, their importance and attributes are not directly related to human use, and they are often not appreciated unless they are modified. Kenya's wetlands are diverse in type and distribution hence the National Environment Management Authority (NEMA) is developing a national database on wetlands. Similar to most wetlands world-wide, KFEs wetlands are faced with numerous threats, such as pollution and other forms of degradation, conversion to other uses especially for agriculture and settlement, in addition to over-exploitation. Currently, the management of wetlands is undertaken by various institutions, among them is the KFS through the Forest Act of 2005, KWS, NEMA through the EMCA (1999) and the WRMA through the Water Act of 2002. However, at certain times the activities and mandates of these institutions overlap, thus rendering them ineffective. For this reason, integrated and innovative management and conservation approaches are required based on the multiple uses of the wetlands and inter-institutional consultations.

To ensure their proper management and utilization, an inventory and mapping of KFE wetlands and springs will be undertaken in order to inform the management process. To safeguard any change in land-use, there is need for the gazettelement of all the wetlands in the region, either under the Water Act 2002 or any other relevant law. This will be followed by assessment of the wetlands in the area to determine their management requirements. It is important that the provisions of the Water Act of 2002 regarding community participation in water resource management are implemented. This will involve the formation of Water Resource Users Association(s) and the preparation of a Sub-Catchment Management Plan(s). Further, a close working relationship with WRMA will be established.

### **Action 1.3: Promote sustainable, consumptive and non-consumptive utilization of forest resources**

The natural forests provide a wide range of non-wood products ranging from medicinal herbs, honey, fish, fruits, vegetables, fibres, nuts and tubers which form an important source of livelihood to forest-adjacent households especially during periods of drought and famine. There is need to establish the carrying capacity and off-take levels of the various non-wood forest products in order to guide the management to regulate their exploitation. At the community level, formation of user groups of different products will be encouraged within the CFAs for ease of regulation of off-take, as well as initiating on-farm production as income generating activities (IGAs). The community has also developed some ecotourism facilities, for example, the KEEP bandas, in addition to tour guiding of the visitors. To regulate the extraction of wood and non-wood products, permits and licenses will be issued.

**Action 1.4: Replace unsuitably sited exotic plantations.**

There are exotic plantations located within catchment and steep areas zoned for indigenous forests. These will be harvested on maturity and replanted with indigenous tree species. Pockets of indigenous forests found within exotic plantations will be conserved in order to enhance the diversity of indigenous forest cover. The existing indigenous forest plantations will be harvested on a sustained yield basis provided that they are not located in critical water catchment areas.

## **Objective 2: To maintain and enhance productivity of industrial forest plantations and increase efficiency in wood utilization**

Forest Plantation establishment is a human intervention that deliberately encourages the planting and tending of trees as a crop to improve quality and enhance supply of timber and wood products to the forest based industries in order to meet the needs of the rising population. Plantation establishment refers to activities carried out in the field to ensure that the seedlings planted develop into fully formed plantations. Satisfactory plantation establishment and maintenance procedures result in tree crops of good quality which are able to make a return on the investment.

Wood has three main attributes which make it a unique raw material: it is universal, abundant and inexhaustible (a renewable resource). Historically, timber has been the wood product that has put the greatest demand upon forest resources. The use to which wood is put is termed as utilization, where timber is the major produce from most forests. Other products include pulp and paper, veneer and plywood, fibreboard, posts, poles, pilings, and fuel wood. For production of high quality timber, there are certain basic requirements such as a good nursery, choice of species, awareness creation, training on different planting techniques as well as links on research of pests and diseases. Sustainable utilization of forest resources can be enhanced by selecting the most suitable species for plantations and integrating the raw-material usage, applying appropriate technology, and by aligning wood production according to specific uses. *The draft Forest Policy Sessional Paper No. 1 of 2007 section 1.4.3* advocates for broadening of the species base through special consideration of indigenous species as well as the requirements of the market.

In KFE, areas that once had indigenous forests were cleared and planted with fast growing exotic and indigenous trees for rapid production of wood products to relieve pressure on indigenous forests. Currently, the total area of exotic plantations in the KFE stands at 5200 ha. The major exotic plantation species have been the *Cupressus lusitanica*, *Pinus patula*, *Bischoffia javonica* and Eucalyptus species. There have also been productive establishments of indigenous species within the plantations, such as the *Maesopsis eminii*, *Olea welwitchi*, *Prunus africana*, *Markhamia lutea* and *Croton megalocarpus*

To ensure the productivity of industrial forest plantations and increase efficiency in wood utilization within the KFE, the following management actions have been formulated.

**Action 2.1: Provide a sustainable, high quality supply of wood products from suitable plantations**

The establishment of a well-sited and efficiently run forest tree nursery is an important prerequisite for any plantation development programme. The four main tree nurseries, Isecheno, Bunyala, Malava, Kibiri, in the ecosystem will be encouraged to raise enough stock for the development of new plantations, rehabilitation of degraded areas and where possible, the supply of seedlings for on-farm tree planting by the adjacent communities. Additionally, the adjacent communities will be encouraged and supported through training and sensitization workshops to raise seedlings for on-farm tree planting and rehabilitation of degraded areas within the forest and community lands. Methods such as PELIS will be explored in order to incorporate the communities and private sector in plantation management.

Adequate information on growth characteristics of indigenous tree species is essential for successful indigenous plantation establishment. It is also essential to increase the choice of exotic species as well as information on species-site matching. Further, the collaboration on management of seed stands with KEFRI for promotion of species diversification will be emphasized. This will ensure control of quality and quantity of planting stock. One of the challenges is that the existing plantations have been developed from a narrow genetic base thus reducing the quality of tree products raised. Like the rest of the country, KFE has been dependent on a narrow choice of species mainly cypress, pines and eucalyptus. This challenge will be addressed by providing diversified sources of seed from the different seed stands within the locality and planting indigenous plantations.

For the purpose of raising exotic and indigenous forest plantations for commercial purpose, the use of certified seeds will be given prominence. Due to the high demand for timber and other wood products, technology on tree clonal forestry will be ventured into with adequate sensitization and training to the managers and communities adjacent to the forest.

A planting programme for each station will be developed to ensure that planting backlogs which currently stand at 1200 ha are gradually eliminated. This will be accompanied by optimal forest management based on Best Forest Practices and felling plans so that silvicultural operations are undertaken on schedule. With the introduction of indigenous species, the development of guidelines for their management and harvesting will be necessary.

In order to promote and achieve sustained plantation forest management in KFE, there is need to invest in capacity building in resource planning and management, impact assessment, geographical information systems (GIS), monitoring and evaluation. Research in non-wood tree products will be encouraged to enhance economic potential and improve the data available for management planning. Emphasis on developing and improving the promotion of forest products along with streamlining the administration and management of the forest plantation enterprise will lead to a sustainable supply for both the industries and local consumption.

**Action 2.2: Sustain wood-based industries for communities and the private sector utilization**

The utilization of wood and wood products from plantations by the private sector and communities has not been optimal. The private sector has been using equipment with very low

recovery rates leading to high losses of round wood. There is need to promote integrated harvesting and utilization. The wood industries will adopt modern processing technologies through training and acquisition of modern wood processing equipment. This will promote efficiency and recovery in timber milling. Further, the technical orders should be revised to ensure that plantations like eucalyptus which are good for production of high quality timber are not harvested for firewood. There is need to diversify plantation development objectives; for example plantation for charcoal production, timber and poles.

In addition, the establishment of plantations will also be demand driven. Wood fuel plantations established for firewood like Eucalyptus species will be used for production of charcoal. There is need for value addition of wood and wood products by the private sector and communities for the local and export market, and the promotion of wood-based cottage industries. Such industries will be equipped with technology that makes use of the various wood products to minimize losses. Additionally, the principle of integrated harvesting will be adopted so that the wood is sold in assortments based on quality and size. Another area in need of exploration is the introduction of other species to the market for utilization to reduce pressure on conventional utilization species.

There are other species of timber that have not commanded a high market due to their need for preservation to ensure a long life. These include the *Pinus patula* and *Grevillea robusta*. The use of wood preservatives will be promoted in the private sector and the communities to reduce the rate of wood degradation. Additionally, the export market will be enhanced through production of high quality products in order to increase foreign exchange earnings. Forest certification and eco-labelling is recommended in order to capture foreign trade. To ensure higher returns on investment KFS will promote efficient technologies in sawmilling and value addition. Consequently this will increase efficient use of forest resources and create employment opportunities for the local communities. KFS and KEFRI will also conduct market research to provide information on periodical market prices for selected forest based products. In addition, forest product merchants will be encouraged to form organised groups for better bargaining and marketing.

There has been a timber harvesting ban in all Government forests since 1999 which has led to overgrown plantations resulting in loss of quality of round wood through non-application of silvicultural treatments, such as thinning, and degradation of wood through heart rot and similar conditions. Illegal logging has also been rampant leading to loss of revenue to the forestry sector. Where theft has been impossible, fires from arsonists have increased. Lifting of the ban is therefore recommended which will ease the pressure on security of the forest. In addition the revenue generated will go a long way in supporting further establishment of plantations through the plough back mechanism.

**Action 2.3: Protect plantations from illegal logging, wildfires, livestock damage, diseases and pests**

Damage to the plantations by people can be checked through controlled entry (legal and illegal) by construction of road barriers and patrols. Joint patrols by the forest rangers, wildlife rangers and community scouts from the forest associations can also help in curbing illegal logging and hence will be encouraged. In relation to damage of tree seedlings by livestock, grazing will not be permitted, but grass cutting will be permitted in accordance with the Forest Service General Orders (FSGO) and with due regard to the suitability of a particular site.

Although the fire danger rating for KFE is not high, unexpected fires can be curbed through proper planning and development of fire plans. The fire lines and forest roads will be maintained particularly during the fire season for ease of mobility and to act as firebreaks. Fire towers for surveillance and fire danger rating boards will be placed in strategic positions. These will indicate the fire seasons and precautions to be taken, including activities like sensitization and awareness creation of the adjacent communities.

Training on how to prevent, reduce and stop any fires is necessary to both the KFS and KWS rangers as well as the surrounding communities. Currently, the equipment for fire suppression is missing and much of the fire fighting is carried out by members of the public using branches and twigs. It will therefore be necessary to ensure that the right equipment for fire fighting is purchased and kept in good condition.

Livestock damage to young plantations will mainly be checked through constant patrols and enforcement of the law. The CFA will collaborate with the Forest Managers to make and enforce rules and orders that may be issued from time to time to manage grass-cutting within the forest. Control of pest and diseases will be done through regular surveillance, appropriate silvicultural practices, and species choice. In cases of disease/ pest outbreak, quarantine measures will be put in place to curb any further spread. Moreover, any disease outbreak will be reported to KEFRI for immediate action.

### **Action 2.4: Conduct forest plantation resource assessment to maximize revenue generation**

In the KFE, plantation areas are adjacent to farmlands which are characterized by high population densities, hence encroachment of the boundaries is a common occurrence. There is need for boundary alignment, maintenance of boundaries through replacement of lost beacons and planting appropriate tree species to mark boundaries, as proposed in Action 1.4 of the Forest Operations and Security Programme.

At present, not all the existing plantations within the KFE have been surveyed or properly documented in compartment registers. This anomaly will be addressed by the ongoing plantation inventory. Maintenance and updating of the compartment registers will be enhanced. The plantation management inventory of the established plantations will be necessary to give insights on the stocking levels and volumes, especially after each silvicultural operation. However, this will only be possible through intensive training of the forest officers in the use of modern inventory methods and equipment. Forest products particularly logs will be disposed in accordance with the provisions of the Public Procurement and Disposal Act of 2007. Further, a felling plan will be prepared for all plantations and all silvicultural thinning and felling of final crop will be based on this plan.

## **Objective 3: Pressure on forest reserves reduced through promotion of farm forestry**

The farm forestry approach was adopted to bridge the gap between demand and supply of tree and allied resources experienced in the early 1970s' in Kenya. This approach focuses on the need of farmers to grow tree crops for environmental protection and social economic gain. Of particular importance is fuelwood, which accounts for over 80% of cooking energy in the country.

During the period after independence, KFE was the main source of fuelwood in Western Kenya. However, the high population growth which is currently estimated at 3% has put unsustainable pressure on the gazetted forest.

Currently, about 50% of domestic fuelwood consumed in Western Kenya is derived from gazetted forests while the rest comes from farmlands. It is required that more effort is put in the promotion of on-farm wood production to meet the increasing demand for fuelwood and other wood products. The following actions have been developed to ensure farm forestry is promoted in KFE.

**Action 3.1: Promote production and utilisation of suitable multi-purpose tree species (MPTS)**

As a result of the high population, household units possess small sizes of land which is not adequate for tree crop production. Therefore, tree growing is only possible mainly through intercropping with food crops. It is therefore appropriate that suitable multipurpose trees are grown in this region to provide for household needs and generate income. Some of the recommended species are as shown in Table 14 below:

**Table 14. Suitable multipurpose tree species for farm forestry**

Species Name	Uses
<i>Makhamia lutea</i>	Fuel wood, building poles, medicinal
<i>Prunus Africana</i>	Timber, Fuel wood, medicinal
<i>Bridelia micrantha</i>	Silk, fuelwood
<i>Croton megalocarpus</i>	Fuelwood, medicinal, bio-fuel
<i>Persea americana</i>	Fuelwood, medicinal, bio-fuel, fruit
<i>Mangifera indica</i>	Fuelwood, medicinal, fruit
<i>Osimum kilimandscharicum</i>	Fuelwood, medicinal
<i>Grevillia robusta</i>	Fuel wood, building poles
<i>Calliandra calothyssus</i>	Fuelwood, fodders
<i>Leuceana leucocephala</i>	Fuelwood, fodders

The KFS forestry extension staff and KEFRI will provide technical information on appropriate tree planting mix and tending to realise targeted products. Additional training on value addition will be carried out in order to achieve maximum returns. Farmers will also be organised in groups for ease of marketing their products for maximum returns.

**Action 3.2: Develop on-farm tree farming, extension, marketing and education packages**

Adequate knowledge on tree crop husbandry and marketing is necessary in order to empower the farmers on the adequate production and marketing of domestic tree products for income. This will require a coordinated and structured extension strategy that will provide sufficient information to the farmer. It is therefore recommended that appropriate packages on on-farm tree farming are developed and implemented. The extension strategy will target schools, organised community groups and individual farmers. Appropriate extension approaches such as Farmer-Field-Schools will also be adopted.

### **Action 3.3: Establish an award scheme for farmers and institutions that embrace farm forestry**

To encourage the farmers and institutions to embrace best practices in on-farm tree planting, recognition awards are a necessary incentive. Hence an award scheme will be established, which will be appropriately structured to provide clear guidelines on levels of competition between institutions, CFAs and individual farmers. The awards will be based on the principle of open, fair and free will of entry and exit. In order to facilitate transparency and accountability, a committee comprising of the representatives of the main stakeholders will be constituted annually. The awards will be issued during annual events such as tree planting day and world environment day, among others. The awards could be in the form of trophies, certificates, cash, bee hives and other related working tools.

### **Action 3.4: Enhance commercial tree planting**

The farmers neighbouring the KFE have been planting trees for subsistence, but this practice has not yet been a sufficient motivation to the farmers. For this reason, there is need to advance the tree farming capacity of farmers for them to embrace commercial tree farming as an enterprise for income generation. Efforts will also be made to connect the farmers to appropriate markets and encourage them to form out-grower schemes for maximum benefits.

Additionally, the wood-based industries will be encouraged to develop strong programmes aimed at supporting tree out-grower schemes where farmers trees which are later the industries on maturity. Currently, such arrangements are in place with Pan Paper Mills in Vihiga and Kakamega Counties. However, there is need to organise the farmers into a formal institution that will enable negotiation for favourable contracts/agreements and assist them in accessing credit as well as good planting materials.

### **Action 3.5: Improve collaboration to promote farm forestry**

There is need to build efficient collaboration mechanisms for tree planting with stakeholders within the KFE. These mechanisms are crucial in standardising the message and approaches of the extension services, spawned by various extension agencies/actors within the region thus reducing any confusion or conflicts that may arise. This can be undertaken through networking with the various agents and conducting joint awareness campaigns. The agencies that will be approached will include the CFAs, NGOs, Ministry of Agriculture and other organized CBOs, as well as the provincial administration (chiefs/Assistant Chiefs).

### **Action 3.6: Enhance production of non-wood forest products**

The KFE is well-known for its rich supply of non-wood forest products which are consumed in various parts across the country. This action aims to enhance the market and value of products like silk, honey and herbs, among others. The farmers will be encouraged to liaise with the service providers like ICIPE, Kakamega Sericulture Cooperative Society, KEEP, NALEP, VIMPRA (Vihiga Mushroom Production Association), and KAMADEP (Kazi Mashambani Development – provides credit for honey enterprises), in order to extend farming of the non-wood products in the ecosystem.

**Action 3.7: Monitor growth and yield of the non-wood products**

The programme will ensure the development of a system for monitoring growth and yield of the non-wood forest products (NWFP) in order to inform on sustainable production and supply. The distribution of farmers growing various NWFP and location of markets will also be mapped. Further, the data provided will form the basis for further research in production and marketing of the products.

## Three Year Activity Plan

The following pages sets out the first 3-Year Activity Plan for the Forest Resources Management Programme. The activity plan details the activities, responsibilities and timeframe necessary for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, the plan sets out specific and time-bound “milestones” that KFE management aims to achieve in implementing the plan.

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
<b>Objective 1: To promote and enhance conservation and sustainable management of natural forest</b>														
<b>1.1: Rehabilitate degraded forest sites in line with Action 2.1.1 &amp; 2.1.2 in the Ecological Management programme</b>														
1.1.1 Operationalize the rehabilitation guidelines developed under action 2.1.1 in the Ecological Management Programme	ZM, Forester													500 ha of degraded forest rehabilitated by June 2015
1.1.2 Prepare a planting programme for the degraded sites														
1.1.3 Hold meetings with stakeholders for sensitization and discussion of the planting programme.	ZM, CFAs, stakeholders													
1.1.4 Acquire indigenous tree seedlings	ZM, CFAs													
1.1.5 Mechanically remove undesirable plant species	Forester													
1.1.6 Prepare the site and plant tree seedlings	Forester, CFAs													
1.1.7 Conduct regular maintenance of planted areas	Forester, CFAs													
1.1.8 Facilitate surveillance/patrol of planted areas	Forester, CFAs													
1.1.9 Clear the boundary and firebreaks regularly	Forester, CFAs													
1.1.10 Monitor the performance of the planted trees	ZM, KEFRI CD													
<b>1.2: Promote Sustainable utilization and Conservation of Wetlands</b>														
1.2.1 Gazette priority KFE wetlands (Priority wetlands will be identified I under Action 2.1.6 in the Ecological Programme)	SRM, ZM, CW, NEMA, KC												Priority wetlands in KFE gazetted by June 2013	

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.2.2 Conduct awareness and sensitization on participatory water resource management.	SRM, ZM													
<b>1.3: Promote sustainable, consumptive and non-consumptive utilization of forest resources in line with Action 2.2.1 in the Ecological Management Programme</b>													Consumptive and non-consumptive utilization promoted and one product domesticated by June 2015	
1.3.1 Organize and build capacity of wood and Non wood resource users into user groups	SRM, ZM, CW, NEMA, KC													
1.3.2 Domesticate on-farm propagation of non-wood forest products														
1.3.3 Device mechanisms for enforcement and monitoring of extraction of wood and non-wood forest products.														
<b>1.4: Replace unsuitably sited exotic plantations.</b>													Unsuitably sited exotics replaced by September 2013	
1.4.1 Conduct a sales inventory of exotic plantations wrongly sited.	ZM, CFA													
1.4.2 Place tenders for sale and harvesting of the plantations.														
1.4.3 Plant indigenous tree seedlings in the harvested area														
<b>Objective 2: Productivity of industrial forest plantations enhanced and efficiency in wood utilization improved</b>														
<b>2.1: Provide a sustainable, high quality supply of wood products from suitable plantation areas</b>													Management guidelines developed for plantations by June 2014	
2.1.1 Acquire certified seeds and apply clonal forestry for superior seedlings production	ZM, KEFRI													
2.1.2 Introduce new exotic species to suitable sites														
2.1.3 Prepare a planting programme for industrial plantation sites														
2.1.4 Prepare management guidelines for indigenous tree plantations														
<b>2.2: Sustain wood-based industries for communities and the private sector utilization</b>														
2.2.1 Train wood processors on modern wood processing technology.	ZM, KFC													
2.2.2 Review technical orders for production of timber and firewood from eucalyptus	KFS HQ													

**FOREST RESOURCE MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons Responsible</b>	<b>Timeframe</b>												<b>Milestones</b>	
		<b>FY 2012-13</b>				<b>FY 2013-14</b>				<b>FY 2014-15</b>					
		1	2	3	4	1	2	3	4	1	2	3	4		
2.2.3 Review of plantation objectives in relation to market demands of wood products.	ZM, KFS HQ														
2.2.4 Sensitize and train community on value addition and local processing of wood products (based on action 2.2.1 in the Ecological Management Programme)	ZM, CD														
2.2.5 Promote the set-up of wood-based cottage industries.	ZM														
2.2.6 Put in place mechanisms to adopt the principle of integrated harvesting.	ZM														
2.2.7 Screening or suitability assessment of new exotic tree species for plantation establishment in Kakamega.	CD, ZM														
2.2.8 Sensitisation and training on use of wood preservatives for the local community.	CD, ZM														
2.2.9 Investigate the potential for production of high quality wood products for export.	CD, ZM														
2.2.10 Create awareness on forest certification and eco-labelling.	ZM, KFS HQ, CD														
2.2.11 carry out wood products price surveys and disseminate to stakeholders	CD, ZM														
<b>2.3: Ensure the Protection of plantations</b>															
2.3.4 Implement the proposed fire management plan under Action 2.15 in Ecological Management Programme	ZM, KFS HQ, CD, KWS														Percentage reduction in fire incidence and extent damage
2.3.4.1 Maintain fire lines, firebreaks and forest roads															
2.3.4.2 Erect fire towers															
2.3.4.3 Repair and erect fire danger warning boards in strategic places															
2.3.4.4 Train rangers (KFS, KWS) and community scouts on fire fighting															
2.3.4.5 Procure fire fighting equipment															
2.3.5 Carry out pest and disease surveillance															
<b>2.4: Improve capacity for forest plantation resource assessment to maximize revenue generation</b>															
														Forest	

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.4.1 Inventory and prepare plantation records (compartment registers etc).	ZM, KFS HQ Foresters													Plantation resource assessment report prepared and felling plans ready by December 2012
2.4.2 Train forest officers in modern inventory methods and equipment.														
2.4.3 Prepare felling plans.														
<b>Objective 3: Pressure on KFE reduced through promotion of farm forestry.</b>														
<b>3.1: Promote production and utilisation of suitable multi-purpose trees species (MPTS).</b>														
3.1.1 Raise awareness on on-farm tree farming.	ZM, DFOs, CFA ZM, DFO													Five Farmer-Field-Schools formed annually
3.1.2 Form and operationalize Farmer-Field-Schools.														
<b>3.2: Develop on-farm tree farming, extension, marketing and education packages</b>														
3.2.1 Prepare educational materials on on-farm tree farming.	ZM, KFS HQ DFO, CW													One training workshop conducted every quarter and two educational materials produced for each workshop
3.2.2 Disseminate or distribute the educational material among the local community and institutions.														
3.2.3 Support “eco-clubs or environment clubs” in schools – exchange programmes														
3.2.4 Organise regular meetings and training sessions with club patrons.														
3.2.5 Organise training sessions for community groups on on-farm tree farming.														
3.2.6 Organise field/open days in the villages to educate farmers/individuals on on-farm tree farming.														
<b>3.3: Establish an award scheme to farmers and institutions that embrace farm forestry</b>														
3.3.1 Hold public meetings to raise awareness on the award scheme	ZM, CW DFO, CFA													Award Scheme established by March 2013
3.3.2 Constitute awarding committee from key stakeholders														
3.3.3 Prepare principles and guidelines for the award scheme.														

**FOREST RESOURCE MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons Responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		<b>FY 2012-13</b>				<b>FY 2013-14</b>				<b>FY 2014-15</b>				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.3.4 Procure awards/presents for the various categories.														
3.3.5 Organize and publicize day of presenting awards to coincide with an annual event (World environment day)														
<b>3.4: Enhance planting of trees on farmers land as an enterprise</b>													500 farmers that agree to form Tree-Out-Grower Cooperative Society annually	
3.4.1 Hold public meetings to raise awareness on commercial tree farming.	ZM, DFO, DCO													
3.4.2 Facilitate farmers form a “tree-out-grower Cooperative Society” to aid marketing and negotiation.														
3.4.3 Assist the “tree-out-grower Cooperative Society” create links with wood-based industries.														
<b>3.5: Improve collaboration to promote farm forestry in KFE</b>													one consultative meeting held every quarter	
3.5.1 Hold consultative meetings with other extension agencies such as Ministry of Agriculture, NGOs, CBOs, etc.	ZM													
3.5.2 Hold joint public meetings on extension with other extension agencies.														
<b>3.5: Create awareness and scale up non wood forest products.</b>														
3.5.1 Hold public meetings to create awareness on the potential enterprises in non-wood products.	ZM, Forester, DCO													
3.5.2 Train entrepreneurial famers in non-wood product enterprise on value addition.														
3.5.4 Assist farmers’ access support such as credit facilities to support non wood enterprise														
3.5.5 Assist producers’ access markets for their products.														



# Community Outreach and Education Programme

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## Programme Purpose and Strategy

The participation and support of the KFE adjacent communities in conservation, sustainable use of forest resources and socio-economic empowerment for improved livelihoods enhanced

The majority of community members in areas adjacent to the KFE directly depend on the forest's natural resources for their livelihood needs. The type of natural resource use in these areas is basically subsistence agriculture and livestock rearing. These communities impact on the KFE, through, for example, accessing the forest for grazing, collection of firewood, water abstraction, collection of different forest resources such as honey, medicinal plants, etc. and are also impacted by the KFE, for example, as a result of wildlife damage to crops or livestock, and even human injury and loss of life. These reciprocal impacts are likely to escalate in the future as population density in the area continues to increase. As such, the KFE Community Outreach and Education Programme will work towards the mitigation of these impacts; improve awareness and education of the KFE's values; and foster a constructive and supportive relationship between KFE management, its adjacent communities and other key stakeholders.

## Guiding Principles

The key guiding principles to achieve the desired programme purpose and to guide in the implementation of the proposed activities for the next 10 years are derived from the following laws, policies, plans and strategies:

- ▶ The Forests Acts, 2005
- ▶ Sessional Paper No. 1 of 2007 on Forest Policy
- ▶ KWS Education Strategy 2006 - 2011 (draft)
- ▶ KWS Strategic Plan 2005 – 2010
- ▶ The Wildlife Conservation and Management Act (Cap 376)
- ▶ Kenya Wildlife Service Park Management Manual (2007)
- ▶ Environmental Management and Coordination Act (1999)
- ▶ The Physical Planning Act (Cap 286)
- ▶ KFS Strategic Plan 2009/10-2013/14
- ▶ Convention on Biological Diversity (1992)

***The guiding principles underpinning the KFE Community Outreach and Education Programme are outlined in the following sections:***

### **There are adequate means of communication between protected area managers and adjacent community**

The community outreach and education programme will strive to ensure that there is improved communication between KFE management and the adjacent community. This is essential to enable both parties to raise common problems and work towards achieving shared goals.

Community support for conservation is paramount and is well embedded in the Convention on Biological Diversity. The role of indigenous and local communities on biological resources conservation is highly recognised, notably in the preamble to the Convention. There is also a broad recognition of the contribution that traditional knowledge can make to both the conservation and the sustainable use of biological diversity, two fundamental objectives of the Convention. It is therefore through improved communication that the contribution of the KFE local communities in the conservation of the forest ecosystem will be strengthened.

### **Communities benefit from conservation of KFE**

Global interest in community conservation has blossomed in recent years due to increased realization of benefits from conservation, indigenous calls for populations to become stewards of nature, and communities and non-government organizations taking the lead in local areas. The same case is being simulated in Kenya. Key benefits of community conservation include its community building effects (skill development, social bonding, trust, stewardship, self-reliance, community identity, sense of pride and belonging); locally appropriate responses and application of local knowledge; multiple individual benefits such as enjoyment, self esteem, satisfaction and personal development; community responses that are more likely to be locally accepted and implemented; and that it supports positive community and government partnering and innovation and better outcomes through having wider input. This programme will seek to foster continued and improved social and economic benefits of community conservation at the KFE. Activities under this programme will also aim to mitigate the costs of wildlife conservation incurred by the adjacent communities, and increase the direct benefits communities receive from the KFE.

### **Communities and other stakeholders are aware of the KFE's values and importance**

One of the core functions of KWS is to provide wildlife education and raise awareness of protected area values in order to improve support for conservation. As such, and in line with the KWS Education Strategy objective to “develop conservation education programmes and disseminate information to targeted groups”, activities under this programme will improve the participation, content and structure of KFE conservation education programmes, and focus outreach activities in community areas where support for conservation is poor, or where there are critical conservation issues that need to be addressed. KFS will promote forest extension in order to increase tree cover and household incomes in addition to enhancing environmental conservation. Additionally, as required by the Forests Act 2005, KFS will support communities to form Community Forest Associations in order to participate in co-management of forest resources.

### **Building bridges for conservation through improved collaboration between PA managers and other stakeholders**

Effective conservation of biological diversity is dependent on a wide and diverse range of stakeholders acting collaboratively. Stakeholder collaboration process can help a range of stakeholders' allies and opponents, public and private sector, communities and individuals to develop a better understanding of the issues and challenges involved in achieving conservation goals and objectives at a variety of scales. Today, large-scale forces such as consumption, technology, investment and trade policies, corruption, and limited capacity drive the threats facing priority conservation areas worldwide. Many of the threats to the ecology and natural

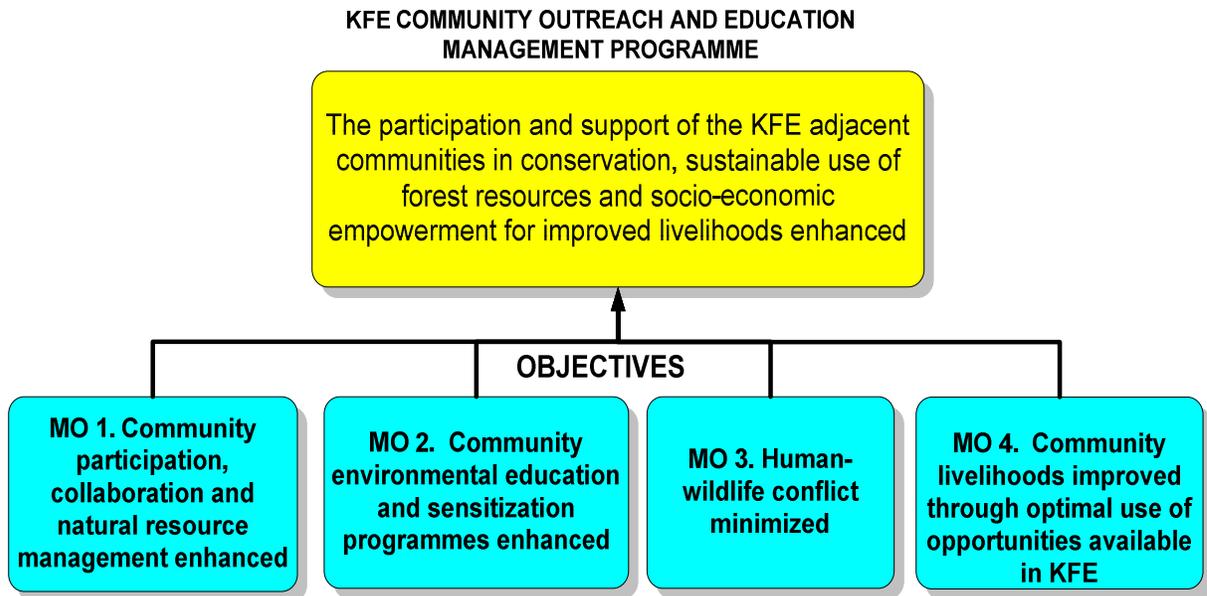
resources in the KFE arise from community land-uses and practises many kilometres beyond the boundary of the forest ecosystem. This programme is therefore based on the premise that, working independently, the KFE management cannot by themselves respond adequately to these pressures. Therefore, cooperation between interested and affected people and groups is necessary if the problems are to be addressed coherently.

These strategic principles are intended to guide the development and implementation of the four Management Objectives that were identified by stakeholders to achieve the Programme Purpose.

## Management objectives

Figure 8 shows the overall objectives tree for the KFE Community Outreach and Education Management Programme.

**Figure 8. Community Outreach and Education Management Programme Objectives Tree**



### Objective 1: Community participation, collaboration and natural resource management enhanced

Stakeholder collaboration is a process through which groups with similar or different perspectives can exchange viewpoints and search for solutions that go beyond their individual goals. Effective and efficient communication and collaboration mechanisms are essential for

building supportive and constructive relationships between protected area managers and surrounding communities. These mechanisms ensure that issues can be raised and addressed by both sides before they escalate into serious problems and they enable managers and communities to work together to achieve common goals.

There is need to establish a mechanism to enhance communication and information flow among all the stakeholders within the ecosystem. It is anticipated that this will greatly contribute towards building cordial relations among them. Indeed, the Forest Act 2005 and the forest Policy 2007 calls for community participation through establishment of CFAs. According to the forest policy, 'for more efficient forest management, the new policy will empower local communities to take an active role in forest management through community forest associations'. In order to achieve this objective, five management actions have been developed focusing on the establishment and operationalization of the CFAs. These are discussed further below.

### **Action 1.1: Build the capacity of CFAs to enhance natural resource management in the KFE**

Collaboration is most effective when the objectives, process, and roles are clearly defined so that those involved know what to expect. The central challenge facing KFE is establishing conservation agendas that balance the diverse and often conflicting interests of a wide range of interest groups, notably the CFAs. The Forest Act 2005 supports the creation of the CFAs and provides guidelines for their creation. The roles of the different CFAs are to participate in the conservation and management of a state forest or local authority forest in accordance with the provisions of this Act. Section 45 subsection 3 (e), for example, states that for the CFAs to be registered, some of the particulars to be included in their proposal should include: use of forest resources; methods of conservation of biodiversity and methods of monitoring and protecting wildlife and plant populations and enforcing such protection. However, the CFAs roles and responsibilities are not clearly understood due to lack of awareness of the provisions of the Act.

Creation of community awareness on the nature of resource management, the salient provisions of forests management legislations such as The Forest Act, 2005, Forest Policy, PFM guidelines, the Wildlife Conservation and Management Act (Cap 376) among others is vital for long-term success in sustainable natural resource management at the KFE. These documents and other literature will be made available, in the BIC, and in different forms to convey the message to all. To enhance the awareness campaign and to reach a wider variety of stakeholders, materials such as posters with pictorial messages, pamphlets translated into local languages and Kiswahili, radio programmes, plays and skits in which songs and dance may be incorporated will be promoted. The KFE management will also enhance the monitoring of activities in the forest by advising and counselling the CFAs on their importance and role in the forest management. In areas where CFAs have not been formed, and where there is need for establishment of a CFA, the management will assist the community in forming one.

### **Action 1.2: Enhance institutional organizational capacity of the CFAs**

The Forest Act clearly provides provisions for the establishment and institutionalization of the CFAs and their user rights. KFE management will assist the community through provision of information and assistance necessary in realising their forest user rights. Other assistance will include capacity development in management and governance among other issues. It is a mandatory requirement that a management plan accompanies the application for establishment

of the CFAs. Since KFE will have this participatory forest management plan and other operational plans, prospective applicants must conform to the provisions of this plan.

**Action 1.3: Develop a mechanism that will ensure financial sustainability of CFAs**

Activities that are allowed in certain areas of the forest include: collection of medicinal herbs, bee-keeping, wood fuel, grass harvesting and grazing in designated areas, collection of forest produce for community based industries, ecotourism and recreational activities, scientific and education activities, plantation establishment through non-resident cultivation, contracted assistance in carrying out specified silvicultural operations, development of community wood and non-wood forest based industries among others. All these activities have the capacity to generate revenue and can thus contribute to financial sustainability if well managed. The management of CFAs needs to be equipped with entrepreneurial, management and raw material value addition skills, through relevant training of its members. This will be done in consultation with other relevant stakeholders. This will prevent misuse/underuse of the resources available, exploitation by unscrupulous persons and will enhance the appreciation of the importance of sustainable conservation of natural resources. The management will also liaise with financial institutions and micro-finance institutions and programs that provide financial services to small micro-enterprises to enlighten the CFAs on access to credit facilities. Once the CFAs are well organized with clear, transparent management, it will be easy for them to identify and convince organizations and institutions including the private sector undertaking economic activities within KFE and which either purchase or supply goods and services to the communities to form formal collaborative arrangements.

**Action 1.4: Assist CFAs to develop proposals for funding**

KFS has provisions to support CFAs access some financial support as stipulated in the Forests Act 2005, Clause 17 “There is hereby established a Forest Management and Conservation Fund, which shall be used for the following purposes” – (f) “the promotion of community-based forest projects”. The Fund is managed by a Finance Committee appointed and empowered by the Board to determine the amounts of money payable in respect of any purpose for which the Fund is established and formulate the conditions for disbursement.

The KWS has the Community Wildlife Service department from which financial support for projects may be accessed. The CFAs being registered entities under the Societies Act are eligible for funding from the Government as well as other sources including commercial institutions and development partners. Through this action therefore, KFE will assist the organized groups in developing proposals for possible funding.

**Action 1.5: Contract CFAs in carrying out forest operations**

The key objective for the establishment of CFAs is to incorporate them in the management or conservation of a forest or part of a forest. Hence, KFS will contract CFAs to carry out activities geared towards minimizing illegal harvesting of forest produce. The CFAs will be required to report any developments or occurrences within the forest which are critical for the conservation of biodiversity. The CFAs will also be involved in general forest activities such as pruning, thinning, and road clearance.

## Objective 2: Community environmental education and sensitization programmes enhanced

The future desired state at the KFE is where enhanced environmental awareness is creating among the various stakeholders to gain support for conservation. To achieve this, a high level of environmental awareness, environmental education should be boosted with the aim of promoting behavioural change towards reducing dependency and pressure on forest resources.

The development and strengthening of programmes for promoting conservation education and awareness forms one of the major objectives of the draft KWS Conservation Education Strategy 2006-2011. Currently, the majority of educational and awareness-raising activities mainly make use of the KEEP Education Centre that includes a tree nursery, botanical garden, etc., which has been in existence since 2005. In addition, both KWS and KFS have community outreach and education programmes that offer environmental education.

At present there is no established education and interpretation centre in Kakamega Forest. However, a Biodiversity Information Center (BIC) has been established to act as an education and information repository center. BIC will work closely with other education institutions within KFE to enhance environmental education. These institutions include; KARI, KEFRI, Masinde Muliro University of Science and Technology, Sigalagala TTC, Kaimosi TTC, Kaimosi University, KEMRI, Baraton University, Kenya Forestry College – Londiani, among others. There are however posters bearing information on the different aspects of the ecosystem at Udos camp. Similarly there are guiding services at both Buyangu and Isecheno.

Management actions designed to achieve this objective are elaborated in the following sections.

### **Action 2.1: Support existing conservation education groups**

The existing conservation education groups, notably KEEP, will be supported through technical backstopping in seeking for funds to run their activities. They will be recognised as vital groups that can assist to disseminate information and create awareness. Support may include working space, means of transportation, and presentation media and allowances, among others.

### **Action 2.2: Strengthen and enhance conservation outreach and education activities**

Both KWS and KFS have a department or section mandated to promote conservation education and outreach activities. These are however inadequately equipped with necessary facilities and materials to effectively offer conservation information to stakeholders. On the other hand, there is need to establish a programme that will target schools in creating awareness on forest conservation and the environment. This is due to the fact that forest destruction mainly occurs due to ignorance and lack of exposure to the importance of forest conservation.

KWS and KFS will therefore develop an awareness creation and education curriculum that will guide the content disseminated within KFE. In addition, KFE management will develop a mechanism that will enhance integration and networking among the education/information

centres. Further, farmers and other organised groups will be reached through public outreach and awareness creation activities of the education and extension programmes. These outreach activities will include training through seminars, field visits, and provision of reading materials among others.

**Action 2.3: Mobilize the surrounding schools to register with WCK**

Wildlife Clubs of Kenya (WCK) is a charitable, non-governmental organisation that was formed in 1968 by Kenyan students with the aim of advancing conservation education. It is open to all and has different categories of memberships that include: students, institutions, associate, foreign and corporate. Some of the programmes offered by WCK include: *Students' Seminars* that embrace sustained education from grassroots to leadership levels for improved environmental protection. *Mobile Education Unit (MEU)* has been and continues to be the most popular conservation education programme of the Wildlife Clubs of Kenya. It is an outreach programme that reaches the clubs at grassroots level countrywide taking conservation messages in a lively and entertaining way.

KFE management will collaborate with WCK to ensure that all schools adjacent to the KFE are members of the WCK.

**Action 2.4: Extend conservation education to remote areas of KFE**

The main block of Kakamega Forest has education information centres and is the predominantly visited sector. This is the preferred destination of organized groups of students and researchers. It is therefore not surprising that most of the education and awareness activities are concentrated in this particular sector of the KFE with other peripheral forests receiving minimal attention. Hence, under this management action, Satellite Education Centers will be established at Malava, Kibiri and Bunyala forests where education and outreach activities are minimal. These education centers will disseminate conservation information to CFAs/CCCs in adjacent areas and the general public. And for these centers to offer their outreach services effectively, they will be equipped with relevant educational tools such as projectors, videos, posters etc. Moreover, education officers will be deployed in these centers.

## **Objective 3: Human-wildlife conflict minimized**

Human-wildlife conflict (HWC) around the KFE is a serious issue, and takes on a variety of forms related to the different land-uses practised around the conservation area. The conflicts can be categorised into four main types: crop raiding; livestock predation; disease transmission; and human injury or death.

Crop raiding is the most common HWC reported by KFE-adjacent communities, and is mainly caused by wild pigs, baboons and other primates. On the other hand, birds of prey such as the hawk prey on domestic chicken as well. Attacks on humans by a variety of wildlife such as snakes also occur. Though little data exists on HWC in KFE, records from Kakamega National Reserve and Kakamega Forest Station for year 2008 indicate that 46 human wildlife conflict incidents were reported. Incidents are mostly high from June to September when crops start maturing and before crop harvesting. This management objective has therefore been designed

to address human-wildlife conflicts thereby improving protected area-community relations. The management actions that will be implemented to achieve this objective focus on:

### **Action 3.1: Adopt new problem animal control techniques**

Human-wildlife-conflicts (HWC) are a common occurrence where wildlife refuges border human settlements. Various methods have been used to curb this problem among them barrier methods such as fencing and moats, and non-barrier methods such as fire and loud noise. In the KFE, HWC is mainly caused by monkeys and baboons that raid crops. These primates live in groups and are able to damage large areas of crops in a single sitting. The HWC hotspots in the KFE include farmlands adjacent to Malava forest where baboons are the main problem animals, and Buyangu, Kisere and Kibiri forest adjacent areas where monkeys are the problem animals.

A wide variety of problem animal control techniques have been developed and tested, with varying success, across Kenya and in a number of other African counties. Use of *Osimum* spp., as a buffer separating the forest and farmlands, for example, has been tried by ICIPE at Ikuywa within KFE and has been effective in preventing crop raiding by primates. Apart from providing a buffer, *Osimum* is a commercial plant that is used in the manufacture of ointment. Hence, to minimize conflicts, efforts will be made to promote its use as a buffer in other areas of KFE. In addition other plant species that keep out primates such as Kei-apple and Mauritius thorn will also be promoted. Further, other problem animal control techniques that have been tried elsewhere to prevent primate damage will be piloted in the KFE and if successful they will be adopted.

### **Action 3.2: Equip the KFE Problem Animal Control (PAC) team**

To create positive human-wildlife co-existence there is need to address the HWC at the KFE effectively and in a timely manner. To do this, resources are needed to reduce conflict as long-term measures are tried tested and implemented. Consequently, to ensure that conflict incidents are addressed promptly, the KFE PAC team will be equipped with a vehicle, additional PAC rangers will be deployed to the KFE, and a HWC database will be established to ensure the conflict from both wildlife and human perspectives is being tracked, understood, and sufficiently addressed.

### **Action 3.3: Expedite the wildlife compensation process**

Currently, wildlife compensation is limited to incidents of human injury or loss of life attributable to wildlife. Adequate and timely processing of wildlife compensation claims can go a long way to improving the relationship between KWS and KFE-adjacent communities. Although historically there have been delays in the processing of compensation claims, these have reduced in the recent past as the District Compensation Committee meets once a month to process all compensations claims received. However, in order to further expedite this process, the Warden KNR will actively follow up on outstanding claims by liaising with KWS Headquarters to hasten payment to beneficiaries. In addition, awareness will be raised amongst the staff and community members on how to process compensation claims as most of them are not conversant with the requirements and procedure for wildlife compensation.

### **Action 3.4: Promote human-wildlife co-existence**

Promoting human-wildlife co-existence is an important aspect in managing HWC. HWC escalates when local communities feel that the needs or values of wildlife are given priority over their own needs, or when local communities are inadequately empowered to deal with the conflict. If protected area authorities fail to work with the local community to address the conflict adequately, the conflict intensifies leading to decline in community support for conservation.

Relevant and timely exchanges of information about all aspects of HWC (nature, extent and mitigation measures) need to be developed to ensure full understanding of the conflict. This information needs to be used by KFE managers and communities to ensure that best practices are being understood, adopted, improved on, and shared. To improve local efforts in conflict mitigation, KFE management will empower the local community with needed resources, skills, and information; and gather, disseminate, test, and improve HWC best practices. Appropriate new, existing, or traditional systems and institutions will be developed or empowered locally to ensure good HWC management. This will require written agreements about roles and responsibilities of the community in managing the conflict. In addition, to improve extension service for human-wildlife coexistence, KFE management will provide the community training in HWC management, mobilize communities for proactive HWC interventions, and implement a proactive communications strategy to engage stakeholders and disseminate conflict-related information.

## **Objective 4: Community livelihoods improved through optimal use of opportunities available in KFE**

The desired future state of the KFE is one where KFE-adjacent communities are benefiting directly from support given through KWS' or KFS social responsibility projects or income-generating conservation-linked projects. Improving benefits to KFE-adjacent communities from the KFE's resources will help offset the costs these communities incur from reduced access to natural resources and HWC, and thereby create community support for the area's long-term conservation. In the KFE, the benefits have traditionally been provided through the KFE community development projects and direct employment. The KFE community development projects aim to support small initiatives that directly seek to improve the welfare of forest-adjacent communities, such as the construction of schools and dispensaries, or the construction of bridges. Some of the KFE stakeholders have also initiated other projects that support community livelihoods, such as community-based ecotourism projects.

The management actions that have been designed to ensure improvement of community livelihood are given in the sections that follow.

### **Action 4.1: Enhance community ownership of projects**

Studies and past experiences have shown that for a community project to be successful the community must be involved in all aspects of the project management cycle. Lack of public involvement or minimal involvement leads to skewed acceptance and duplication of projects. To

increase project success rate, KFE management will ensure that comprehensive public involvement is incorporated in projects at all times by providing the opportunity to the community to identify and prioritize projects. This will be accomplished through working with democratically elected project committees in identification and implementation of community projects. In addition, to increase ownership the community will be expected to cost-share the project expenses with the project financier.

**Action 4.2: Conduct post-project evaluation of completed community projects before initiating new projects**

Several community projects have been implemented in the KFE in the recent past. On the other hand, several projects have been proposed for implementation in the next few years. Tables 15 and 16 give recently completed and proposed KWS-supported community projects.

**Table 15. Completed Community Conservation Projects**

Year	Village/Area	Project Description	Project Cost (Ksh.)	Remarks
2005-2006	Kisere	Community bridge across Nandamanywa river	1.55M	Complete
2007	Buyangu Village	Rehabilitation of five class rooms at Buyangu primary	0.8 M	Complete
2007	Shihingo village	Construction of a new office block at St. Kizito – Shihingo Primary School	1.5 M	Complete

**Table 16. Proposed Community Projects**

Year	Village/Area	Project Description	Project estimated cost
Bills of quantity prepared and sent	Buyangu community	Proposed access road 1.4 KM Mukangu – Kambiri road that joins access road to the main gate	2.805 M
Bills of quantity prepared and sent	Chesero / Fuvale	2 Classrooms for Fuvale primary school	1.4 M
Bills of quantity prepared and sent	Buyangu community	Administration block fro Buyangu Primary school	1.5 M
Organized from KWS HQs (IDM)	Buyangu community/ KWS staff	Borehole	1.5M

During the 10 year plan period, the status of the completed and on-going projects will be assessed to ascertain whether their objectives have been achieved. Both internal and external independent evaluations will be undertaken in order to get a balanced feedback.

**Action 4.3: Give KFE adjacent community priority when employment opportunities arise**

The KFE management hires skilled and unskilled casual labor from local communities for silvicultural activities, construction projects and maintenance of roads and nature trails. Unemployment levels are currently very high in the KFE-adjacent areas and thus employment opportunities that can be taken by the local communities will be encouraged. Through this action, therefore, casual labour will be sourced from the neighbouring community for activities such as tree pruning, thinning, tour guiding, harvesting of regulated wood and timber products among others. This is in anticipation that it will raise the local communities' commitment and participation in forest conservation.

**Action 4.4: Assist groups involved in Income Generating Activities (IGAs) to realise their full potential**

A common problem to the initiation of IGAs is the long periods taken to register and approve them due to the lengthy bureaucratic procedures and institutions that need to approve them, such as KWS, KFE, NMK and Kenya Tourism Board (KTB). This will be addressed by harmonising the registration procedures and shortening the approval period. All the relevant stakeholders will work together to achieve this. The community will be sensitized on the nature of projects that can be approved within forests and protected areas.

It is crucial for the IGAs (existing and new) to formulate business plans that outline their primary objectives and goals, membership, location and contacts, their activities and operations, future prospects and projections, capital and revenue base, partners among other information. A well formulated business plan is an important document since it can be used to source for funding and seek loans too. Through this action, KFE will liaise with other stakeholders to assist in building capacity of community groups to offer training on formulation of business plans and general management. As part of capacity building for the IGAs, the groups will be encouraged to elect skilled leaders and have fair representation of all interested persons including the youths.

On the other hand, the KFE management will support training of community groups in value addition methods such as processing, packaging, labelling, branding, and certification by quality assurance bodies such as Kenya Bureau of Standards (KEBS) to improve the competitiveness of the products in the market and increase returns, and provide extra impetus for re-investing in the business. In addition, to support the IGAs further, the KFE management will also link the IGAs to existing and successful related projects for exposure and mentorship. This will be done through study tours for selected members to other similar successful projects. Further, the IGAs will be assisted in setting up a transport and supply system for their goods.

**Action 4.5: Liaise with relevant institutions to map sites of historical and cultural values and establish cultural centres**

National Museums of Kenya (NMK) are mandated to designate and establish sites and events of cultural or national importance. In the greater KFE potential cultural sites include *the crying stone*, a site that receives visitors but lacks proper management; circumcision sites for the different clans of the Luhya community; oath taking sites such as Malava – Murembe, Musala kwa eshilulu, Ghost area (Mananyenzo) in Buyangu, hyena rock for rain makers should be

evaluated for designation as potential important sites by NMK. Through this action, the KFE management will liaise with NMK in assessing the potential of these sites for possible designation as national monuments. Based on the outcome of this assessment, cultural centres will be established on sites that have outstanding cultural values.

**Action 4.6: Promote modern and appropriate crop and livestock production practises within the KFE**

Poverty and food insecurity are the underlying causes of forest destruction which is manifested in form of poaching and illegal extraction of timber and other forest products. It is anticipated that with improved food production and diversification of community livelihoods, there will be reduced pressure on the forest. In order to achieve this, KFE management will liaise with relevant line ministries to promote appropriate modern crop and livestock production techniques that would raise productivity per farm unit.



# Three Year Activity Plan

The following pages sets out the first 3-Year Activity Plan for the Community Outreach and Education Management Programme. The activity plan details the activities, responsibilities and timeframe necessary for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, the plan sets out specific and time-bound “milestones” that KFE management aims to achieve in implementing the plan.

<i>Management Action and Activities</i>	<i>Persons responsible</i>	<i>Timeframe</i>												<i>Milestones</i>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
<b>Objective 1: Community participation, collaboration and natural resource management enhanced</b>														
<b>1.1: Build the capacity of CFAs to enhance natural resource management in the KFE</b>														
1.1.1 Hold regular workshops with CFS to sensitize them on the provisions of the Forest Act 2005, that lead to their establishment	ZM, CFA,													5 training workshops conducted by Dec 2012
1.1.2 Produce brochures, pamphlets, posters and leaflets, translated into local languages and Kiswahili to be distributed amongst CFA posters														
1.1.3 Avail, relevant awareness materials at the BIC library in different forms that can be accessed by CFAs. For example, The Forest Act 2005, Forest Policy, PFM guidelines, the Wildlife Conservation and Management Act (Cap 376) among others														
1.1.4 Monitor the activities of the CFAs and keep reminding them of the importance of their roles in the forest management														
1.1.5 Hold regular meetings with CFAs to re-evaluate their achievements														
1.1.6 Guide and encourage formulation of CFAs where necessary														
<b>1.2: Enhance institutional organizational capacity of the CFAs</b>														

Management Action and Activities	Persons responsible	Timeframe												Milestones	
		FY 2012-13				FY 2013-14				FY 2014-15					
		1	2	3	4	1	2	3	4	1	2	3	4		
1.2.1 Assist the CFAs to participate in the conservation and management of KFE in compliance with the Forest Act 2005	ZM, CFA													All CFAs actively institutionalized by Dec 2012	
1.2.1 Assist CFAs in formation of forest user groups															
1.2.2 Create capacity of CFAs forest user rights in management and governance among other issues															
1.2.4 Ensure prospective applicants for establishment of CFAs conforms to the provisions of this Management Plan.															
<b>1.3: Develop a mechanism that will ensure the financial sustainability of CFAs</b>															
1.3.1 Enhance the capacity of CFAs to generate revenue out of the activities allowed under the forest user rights	ZM, CFAs, Community Warden														Training workshops for CFA officials conducted every 3 <sup>rd</sup> quarter and financial sustainability ensured by June 2015
1.3.2 Train the officials of CFAs on entrepreneurial, management and raw material value addition skills															
1.3.3 Provide guidelines on the identification, selection and development of alternative income generating activities															
1.3.4 Liaise with Financial and Micro-finance institutions and programs that provide financial services to small micro-enterprises															
1.3.5 Identify organizations and institutions for possible collaboration in marketing, buying or using products from CFAs															
<b>1.4: Assist CFAs to develop proposals for funding</b>															
1.4.1 Provide training in proposal writing and, implementation	ZM, CFAs, Community Warden														Each CFA develops 5 proposals with a success rate of 50% funding by June 2015
1.4.2 Review project proposals and interact with CFAs in revising and improving them ready for approval															

**COMMUNITY OUTREACH & EDUCATION MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.4.3 Support visits to existing successful projects and underline lessons learnt in project management														
1.4.4 Submit the proposals to relevant institutions and follow-up														
<b>1.5: Contract CFAs in carrying out forest operations</b>														
1.5.1 Incorporate CFAs in forest management activities including: <ul style="list-style-type: none"> <li>▶ CFAs to Carry out security duties</li> <li>▶ Law enforcement</li> <li>▶ Dissemination of information and public education</li> <li>▶ Emergency response and fire fighting</li> </ul>	ZM, CFAs, Community Warden													CFAs involved in forest operations throughout
<b>Objective 2: Community environmental education and sensitization programmes enhanced</b>														
<b>2.1: Support existing conservation education groups</b>														
2.1.1 Assist KEEP and any other conservation education groups with the needed working gear essential for their operation	ZM, CFAs, Community Warden													
2.1.2 Incorporate conservation education groups in outreach education programmes for both KWS and KFS														
2.1.3 Provide technical support to education groups in soliciting for their funding activities														
<b>2.2: Strengthen and enhance conservation outreach and education activities</b>														
2.2.2 Conduct collaborative joint forest conservation outreach activities (KWS, KFS, Conservation education groups and other stakeholders)	ZM, CFAs, Community Warden													Education Conservation Curriculum developed by April 2013, Outreach print materials developed and printed by September 2013
2.2.1 Develop conservation education curriculum for KFE														
2.2.3 Prepare, print and distribute materials for distribution and outreach education														

Management Action and Activities	Persons responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.3.4 Organize conservation workshops and seminars inclusive of local and opinion leaders			■				■				■			2 conservation workshops held every second quarter,
2.3.5 Organize and participate in local events where there are opportunities to reach communities(bull fighting)			■	■	■	■	■	■	■	■	■	■	■	
2.3.6 Use mass media to reach out to large audiences(Mulembe FM)				■	■	■	■	■	■	■	■	■	■	
<b>2.3: Mobilize the surrounding schools to register with WCK</b>													5 schools register with WCK annually	
2.4.1 Enlighten school children and schools to join WCK during conservation education to schools	ZM, CFAs, Community Warden	■	■	■	■	■	■	■	■	■	■	■		■
2.4.2 Sensitize on formation of environment and wildlife clubs in schools		■	■	■	■	■	■	■	■	■	■	■		■
2.5 Extend conservation education to remote areas of KFE													Three Satellite Conservation Centres constructed by June 2015	
2.5.1 Establish Satellite Education Centres at Kibiri, Malava and Bunyala	ZM, CFAs, Community Warden									■	■	■		■
2.5.2 Sensitize the community on the relevance and use of the centres										■	■	■		■
2.5.3 Adequately equipped the centres with trained staff and education materials													■	
<b>Objective 3: Human-wildlife conflict minimized</b>														
<b>3.1: Adopt new problem animal control techniques</b>													Appropriate PAC methods identified and HWC minimized by 50% by June 2015	
3.1.1 Liaise with research section to identify and assess new PAC techniques, including wildlife scaring methods	Community Warden ZM, CFAs,	■	■	■	■	■	■	■	■	■	■	■		■
3.1.2 Undertake study visit to other sites using PAC techniques, especially for elephants					■				■					■
3.1.3 Obtain PAC equipment as necessary and carry out pilot trials in appropriate communities					■				■					■
3.1.4 Sensitize community members on plant species that cannot be destroyed by wildlife and other mechanisms that avoids HWC		■	■	■	■	■	■	■	■	■	■	■	■	

**COMMUNITY OUTREACH & EDUCATION MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.1.5 Incorporate traditional methods of avoiding HWC in outreach education curriculum														
3.1.6 Popularize the use of Osimum spp. as a HWC mitigation measure that offers alternative sources of livelihoods														
<b>3.2: Equip the KFE Problem Animal Control (PAC) team</b>														KWS PAC team equipped appropriately and a database set for PAC by Dec 2012
3.2.1 Train PAC rangers regularly on new techniques of handling PAC cases	Community Warden ZM, CFAs													
3.2.2 Provide computer and relevant database management system for recording and managing HWC issues														
3.2.3 Liaise with KWS to get appropriate PAC equipments for KFE														
<b>3.3: Expedite the wildlife compensation process</b>														Five sensitization meetings held by June 2015
3.3.1 Sensitize the community on the legal provisions with regard to compensation	Community Warden ZM, CFAs													
3.3.2 Inform the community on compensation processes through public barazas and any other opportunistic awareness raising activities.														
3.3.3 Use local media to also sensitize the community on compensation														
<b>3.4: Promote human-wildlife co-existence</b>														Reporting and response time on HWC incidents improved by 50% by Dec 2012
3.4.1 Provide hotline numbers for faster reporting on HWC cases.	Community Warden ZM, CFAs													
3.4.2 Clearly outline a work plan to visit all the hotspot areas with a view to sensitize the community on how to co-exist with wildlife.														
3.4.3 Facilitate prompt response to HWC incidences														
<b>Objective 4: Community livelihoods improved through optimal use of opportunities available in KFE</b>														
<b>4.1: Enhance community ownership of projects</b>												Project sustainability		

Management Action and Activities	Persons responsible	Timeframe												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
4.1.1 Give priority support to projects identified, initiated and backed by the community	Community Warden ZM, CFAs													and success rate improved by 80%
4.1.2 Conduct community sensitization before the start of any major project in KFE														
4.1.3 Involve community in all stages of project cycle management														
4.1.4 Empower the community on their expected roles whenever there are projects														
<b>4.2: Conduct post-project evaluation of completed community projects before initiating new projects</b>													Evaluation report ready by September 2013	
4.2.1 Identify the best methodology for conducting the evaluation	Community Warden ZM, CFAs													
4.2.2 Prepare TORs for possible consultancy														
4.2.3 Advertise for the call for Expressions of Interest (EOI)														
4.2.4 Commission the conduction of the study by the successful consultant														
4.2.5 Follow the Public Procurement and Disposal Act and identify the best consultant to carry out the work														
4.2.6 Follow the recommendations from the study to advice on the best approach for initiating community projects														
<b>4.3: Give preference in employment opportunities to the neighbouring community</b>													Temporary employees employed on permanent basis by June 2013 and at least 90% of unskilled labour hired from the locals	
4.3.1 Liaise with both KWS & KFS headquarters to formalise temporary employee contracts on a permanent basis, including Banda attendants, customer care	Community Warden ZM, CFAs, KWS/KFS Hqs													
4.3.2 Hire neighbouring locals for unskilled labour including silvicultural activities, road, nature trail maintenance, etc														
<b>4.4: Assist groups involved in Income Generating Activities (IGAs) to realise their full potential</b>													Each community group	

**COMMUNITY OUTREACH & EDUCATION MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Timeframe</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
4.4.1 Sensitized the community on the nature of projects that can be approved and allowed within KFE	Community Warden ZM, CFAs													with IGA develops a business plan, and at least 3 new IGAs formed annually by June 2015
4.4.2 Assist the community to hasten the process of registering IGAs														
4.4.3 Assist the existing and new IGAs to formulate business plans to ensure their sustainability														
4.4.4 Liaise with other stakeholders to assist in building capacity for groups with IGAs to offer training on formulation of business plans and general management														
4.4.5 Assist IGAs to find profitable and sustainable markets for their goods and improve on value addition														
4.4.6 Link the IGAs to existing and successful related projects for exposure and mentorship.														
<b>4.5: Liaise with relevant institutions to map sites of historical and cultural values and establish cultural centres</b>													At least 5 National monuments identified and gazetted as National Monuments by Dec 2013	
4.5.1 Liaise with NMK to identify and evaluate important historical and cultural sites within KFE for designation as National monuments and events	Community Warden ZM, CFAs, NMK													
4.5.2 Follow-up the gazetted of these sites as national monuments														
<b>4.6: Promote modern and appropriate crop and livestock production practises within the KFE</b>													Two sensitization campaigns conducted annually and 100 farmers adopt appropriate crop and livestock practices	
4.6.1 Liaise with relevant MoA and MoL to enhance agricultural extension services in KFE	Community Warden ZM, MoA, MoL													
4.6.2 Intensify sensitization campaigns to educate the locals on importance of practicing economical livestock husbandry														



# Forest Operations and Security Programme

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## Programme Purpose and Strategy

Operational systems and structures support delivery of the KFE management programmes

The KFE faces an array of management challenges emanating from increasing population of the adjacent communities that are increasingly exerting pressure on the forest resources. There are 57 village communities whose land border Kakamega Forest and are the prime local users of the forest resources. The threat exerted from the adjacent land-uses and livelihood activities is likely to increase during the 10-year period of this plan. Therefore this requires adequate and complementary management responses on the emerging issues.

The KFE Forest Operation and Security Programme provides the backbone of the whole plan in reference to availing the necessary resources in terms of finances, human capital, materials and equipment. Inadequate human capital is one of the challenges facing delivery of management services at the KFE. This programme deals with ways of establishing the optimal staffing levels and improving the morale of the staff working within the ecosystem. On the other hand, the development of supportive, efficient and effective management structures and mechanisms is an essential foundation underpinning all aspects of KFE management and development. Security is an integral component for any meaningful development and any security lapse would jeopardize the smooth operations of the ecosystem. Through this programme, therefore, security issues that will ensure the conservation of biodiversity as well as the safety of visitors and staff have been addressed.

## Guiding Principles

The following sections set out the **strategic principles** that will guide KFE Management in the implementation of the Forest Operations and Security Programme to achieve the Programme Purpose. These principles describe key factors taken into account in the development of the programme and that influence the way the programme is implemented in achieving the programme purpose. These principles have largely been drawn from the following legislations and policies:

- ▶ The Wildlife Conservation and Management Act CAP 376
- ▶ Kenya Wildlife Service Park Management Manual (2007)
- ▶ The Forest Act, 2005
- ▶ Sessional Paper No. 1 of 2007 on Forest Policy
- ▶ KWS Strategic Plan 2005 – 2010
- ▶ Environmental Management and Coordination Act (1999)
- ▶ The Physical Planning Act (Cap 286)
- ▶ Kenya Public Procurement and Disposal Act 2005

***In implementing the KFE's Forest Operations and Security Programme, KFE Management will strive to ensure that:***

## **Holistic and integrated management of the KFE that ensures constructive working relationships between KWS and KFS is realised**

KFE is under the management of KWS and KFS. Each management unit solely manages its own area of jurisdiction but consults on issues that are cross cutting and require joint attention. Enhancing collaboration between the two management units will ensure the conservation of the area's shared Exceptional Resource Values, and facilitate the development of tourism across the entire ecosystem in an appropriate and compatible manner. To make this possible and given the fact that both institutions are Government entities and both have accepted to have a joint Management Plan, activities under this programme aim at ensuring mechanisms are put in place to enhance collaboration in issues that require mutual agreements thereby promoting a holistic integrated management. This will reduce conflict of interest in promotion of tourist activities and facilities as well as ensuring efficient communication.

On the other hand, all stakeholders operating within and outside the protected areas need to be given due consideration in the management of the KFE. Stakeholders that have influence on the ecosystem range from government institutions, NGOs, Local and International Researchers, Community Based Organizations and other informal groups. Effective collaboration and networking amongst these stakeholders and the KFE is paramount and will enable the attainment of the purpose of the ecosystem. For example, there is need for good collaboration between the KFE management and other government institutions such as livestock and agricultural ministries because the two are the main pillars for economic development in the region.

## **Provide efficient, sufficient well motivated workforce for effective and smooth running of the KFE**

It is important to understand that staff spends at least half of their time at work. They contribute to the success of the organization they work for when they are free from worries and when they feel their welfare needs are considered. An appropriate welfare program that addresses staff issues such as health, bereavement, counselling, work related stress, provision of decent living and working conditions, prompt payment of salaries and allowances staff wellness and education assistance need to be developed. It is quite unlikely for a demoralised staff to provide the expected output. For them to operate effectively their needs and concerns need to be attended to. Activities under this programme will therefore aim to ensure that staff is well trained and their skills upgraded where necessary and equipped to carry out their tasks and that appropriate staff welfare and accommodation facilities are provided.

## **Provide adequate management infrastructure (Buildings, Road network, Transport and Communications) to support KFE operations**

For effective and efficient management of KFE, good transportation and communication throughout the forest is of paramount importance. As such, a good integrated road network and communication system will be developed to ensure smooth park operations which are essential for effective management. Adequate and reliable vehicles for both park administration and security operations will also be provided.

## Commitment in the provision of financial and other resources will be forthcoming

Generally, KFE suffers from poor budget allocations, a fact that has led to deterioration of its infrastructure and facilities due to lack of maintenance. For proper implementation of this Management Plan, it will require the KFE main stakeholders, KWS and KFS, to allocate adequate financial resources to implement the management actions outlined in this plan.

## Protecting and conserving KFE exceptional biodiversity values to maintain forest ecological integrity

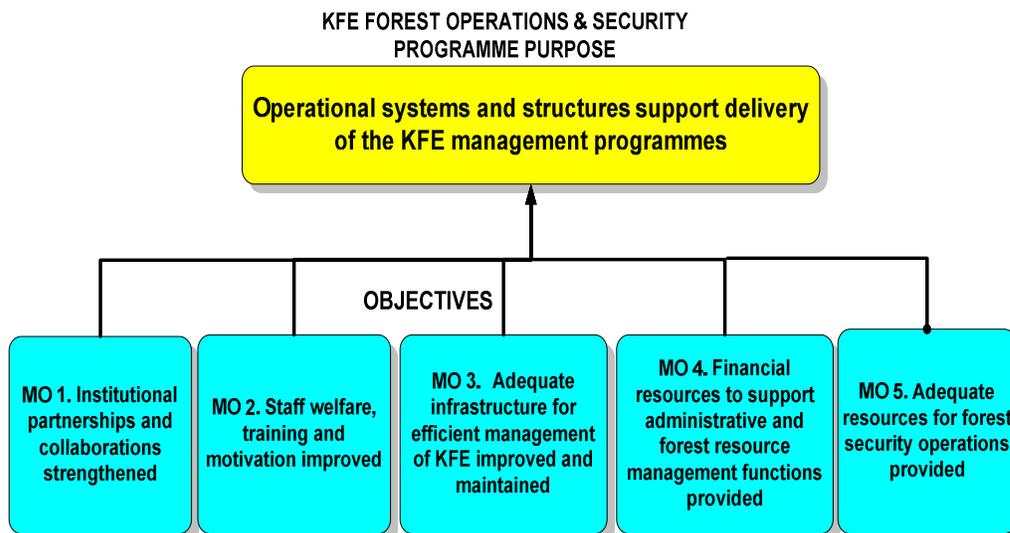
KFE has the reputation of being the only tropical rainforest in Kenya which is a remnant and eastern limit of rainforests of the Guinea Congolese and West Africa rainforest with diverse exceptional biodiversity values. The conservation of these natural resources and the ecological integrity of the area for posterity is the primary function of the KFE, and one of the most important duties of the area’s management. As such, this management programme will ensure that the area’s natural resources are not degraded by illegal activities such as illegal logging, over grazing, charcoal burning and poaching. In addition, it is also imperative to ensure that KFE remains a safe haven for visitors as well as for forest adjacent communities.

These strategic principles are intended to guide the implementation of the Programme’s six management objectives that, when taken together, achieve the Programme Purpose.

## Management objectives

Figure 9 shows the overall objectives tree for the KFE Forest Operations and Security Programme.

**Figure 9. Forest Operations & Security Programme objectives tree**



The following sections describe these management objectives and provide an outline of the management actions needed to achieve them. Under each management objective there is a brief description of the relevant management issues and opportunities, which provide the specific context and justification for the management actions.

## **Objective 1: Institutional partnerships and collaborations strengthened**

The development and strengthening of institutional collaborations is paramount in the attainment of the overall purpose of this management plan. Liaising with and supporting other stakeholders (for example NGOs, government agencies and individuals) in the implementation of specific integrated biodiversity programs is very crucial in a forest ecosystem. An enabling relationship with sectoral government institutions responsible for livestock, water, agriculture, and Provincial Administration will ensure that KFE has the much needed government support necessary to achieve the different management objectives outlined in this management plan.

To enhance good relationships with such institutions, the KFE management will be participating in District Committees such as District Development Committee, District Security Committee(s), District Environment Committees, etc., to improve collaboration and communication with the District authorities. Cooperation with organizations that operate within the region supporting conservation efforts in one way or the other, such as KEEP, Nature Kenya, Hoteliers, etc., will be strengthened in order to ensure their efforts are recognized and supported by the management. Working relationships with the existing Community Based Organizations (CBOs) and Community Forest Associations, Wildlife Working Groups, Honorary Wardens, Suppliers, Merchants, Tour Operators, etc., will as well be strengthened.

Institutional partnership will also be strengthened for the two management units (KFS and KWS). Currently there are no clear policy guidelines for integrated management of the forest ecosystem with each management unit concentrating on their area of jurisdiction. To ensure integrated forest ecosystem management in KFE, appropriate, formal agreements will be developed through proper consultations.

In order to achieve this objective, four management actions have been developed. These actions are elaborated in the following sections.

### **Action 1.1: Enhance wider stakeholder participation in KFE**

Forestry is no longer a sectoral affair. Nationally it's a component in the integrated economic recovery strategy efforts aimed at raising the living standards of the people through natural resource conservation, sustained agriculture, employment creation and increased industrial output. New strategies need to be developed at the national level in order to respond to the changing scenario. This will involve building several forms of partnerships in forestry management. There exist many development agencies in the KFE including government departments, local and international NGO's, and CBO's that promote various conservation and development themes. Through this action, the KFE management will ensure that the roles of different stakeholders as relates to activities aimed at the conservation of Kakamega forest are established and their contribution to the economic development of the KFE and the conservation of the forest in particular, is understood. This will be aimed at improving the current relationship

amongst the forest management, communities and other stakeholders. On the other hand, involvement in PFM can reduce possible conflicts with Forest Management authorities and increase possibilities of environmental degradation arising from group activities. Hence, to ensure that KFE management is engaging with environmentally friendly groups, only well organised groups will be registered. These have Links with GOK, NGOs, and other CBOs, have bank accounts, are active and hold regular meetings and elections, and actively contribute to the economies and welfare of the surrounding community.

In addition, the relationship with the existing Community Based Organizations (CBOs), Community Forest Associations, Wildlife Working Groups, Honorary Wardens, Suppliers, Merchants, Tour Operators, etc., will be strengthened.

**Action 1.2: Establish a KFE Management Advisory Committee**

Based on the number of the stakeholders that are involved in the general operations of the KFE through their activities, it will be necessary to promote and enhance a wider stakeholder collaboration geared towards ensuring that activities by the different stakeholders are coordinated and integrated towards achieving the plan purpose. A Management Advisory Committee will thus be formed primarily to oversee the implementation of the management plan and help in coordinating the activities of the different stakeholders operating in the region. The composition of this committee will be made possible once the roles and responsibilities of the different stakeholders have been known as proposed in Action 1.1 above. Tentatively however, the composition will basically constitute of KWS, KFS, NEMA, Hoteliers, Timber Industry, representatives from CFAs, NGOs, Institutions of Higher Learning in the region, other relevant government ministries etc. Once constituted and given legal mandate to operate, this committee will, apart from overseeing the implementation of this management plan and coordination of different stakeholder activities, assist in soliciting for funds for the implementation of different management activities in this Plan as well as provide timely advice to the KFE management.

**Action 1.3: Improve communication within KFE**

Efficient communication between plan implementing organs is vital for the success of the plan and smooth running of KFE operations. For instance, the ticketing departments within KWS and KFS should be able to communicate effectively and share information easily to avoid double charging of visitors. This will therefore call for the establishment of an effective communication and feedback mechanism between KFS and KWS field departments to ensure smooth operations.

**Action 1.4: Demarcate and carry out regular maintenance of the KFE boundary**

The different forest blocks making up the KFE are demarcated and gazetted for forest protection and conservation. The boundaries in some areas are clearly demarcated and maintained through clearing of vegetation. However, in some sections of the Kakamega forest block, the boundary is clearly demarcated with a strip of the Nyayo Tea Zone (NTZ) leaving a small section of the boundary unmarked. Through this action, KFS will liaise with NTZ to extend their NTZ belt to cover the remaining section and act as a buffer between the forest and adjacent communities. Some areas of the NTZ belt have soils that are not ideal for tea and in such areas the NTZ has planted exotic tree species that they use to process the tea. This is, however, against the

agreement between the KFS and the NTZ which stipulates that only NTZ should focus on tea while KFS deals with planting trees. In such instances, sufficient consultation between NTZ and KFS will be done before taking any tree planting exercise. Such areas will be clearly demarcated and the boundary cleared and maintained to act as a fire break and patrol road around the forest. All the boundary beacons will be geo-referenced to ensure that they are easily identifiable. To facilitate boundary maintenance, the boundary will be graded to a width of six meters. Further, the community will be sensitized to enlighten them on the importance of the boundary marking.

In addition, the entire boundary will be surveyed to cadastral standards and Title Deeds acquired for all forest blocks. The boundary between KFS and KWS will as well be demarcated and clearly marked. This is necessary because the two institutions have different management approaches with KFS allowing controlled consumptive utilization of forest resources, while KWS allows only non-consumptive uses. The boundary marking between KFS and KWS forests will however require a boundary demarcation system that does not affect the ecological integrity of the ecosystem. This can be done by establishing a dense forest belt of mixed indigenous tree species that can easily be noticed. This will require the two management units to agree on the modalities including agreeing on the alignment of this boundary as well as providing a strip of land, for example, ten meters on each side to have a 20m belt that is easily distinguishable from the rest of the forest. Once this belt is established, the community will be sensitized on the new boundary alignment to curb encroachment of illegal activities into the national reserve section.

## **Objective 2: Staff welfare, training and motivation improved**

The KWS managed section of the KFE has a workforce of 38 staff of various cadres. This number is inclusive of the Kakamega station at Kakamega town and the reserve (Buyangu and Kisere). The KFS managed forest blocks have a total of 117 staff members. Though no studies have been conducted to establish the optimal staffing levels, these numbers, according to KFE management are not adequate to effectively manage the forest ecosystem. The staff shortfall is often substituted by engaging casual labour in the understaffed sections e.g. road maintenance, forest silvicultural activities, etc).

In order to improve staff performance and output, staff training and capacity building at all levels is essential. Majority of the staff, especially rangers have not undergone skills upgrading or refresher courses with others remaining in the same rank till retirement. This can have negative impacts on the morale of the staff, and consequently their ability to perform to their maximum potential.

Consequently, to address the inadequacies noted on staff establishment, training and staff morale, and to realise improved efficiency and effectiveness of staff at the KFE, five management actions have designed to realize this objective. These focus on: conducting a workload and job analysis for both KWS and KFS staff; ensuring continuous capacity building for KFE staff; improving on welfare provision for KFE staff; and ensuring discipline is observed at all times. These actions are elaborated further in the following sections.

**Action 2.1: Conduct a workload and job analysis for both KWS and KFS**

Majority of staff in both KFS and KWS are uniformed and of different cadres. According to the staff establishment, the staff at the KFE is not adequate to manage natural resources at the ecosystem effectively. For smooth administration and management of the forest ecosystem a study will be conducted to establish optimal staffing levels for each cadre of staff. Once this is done, KFE management will liaise with their respective Human Capital Departments to deploy staff in line with the recommendations of the study.

**Action 2.2: Ensure continuous capacity building for KFE staff**

KFS is in the process of restructuring itself from the Forest Department to a fully fledged KFS parastatal. This management plan will ensure that it capitalises on this restructuring to ensure that KFE is provided with adequate and qualified manpower. On the other hand, together with KWS, a training needs assessment to determine training gaps will be carried out. This will be geared towards improving staff performance and the ability to adequately and competently implement this management plan. On the other hand basic training such as skills upgrading will be promoted for the uniformed staff and this will be on a regular basis to ensure discipline is maintained at all times. Some basic training that does not require much input in terms of finances will be conducted immediately. This will include training of rangers or NCOs in drafting of charge sheets and prosecution of court cases to avoid the enormous incidents of dismissal of cases due to minor mistakes.

Some of the basic training that could be conducted includes:

- ▶ computer training for all senior officers;
- ▶ basic training for some rangers (KWS and KFS) at Manyani or other military training institutes;
- ▶ first aid training for rangers;
- ▶ range practice and training on shooting skills;
- ▶ on-the-job PAC training for rangers;
- ▶ NCO's and security officers training in prosecution of court cases; and
- ▶ basic training for rangers on forest management, GPS applications, map reading, and data collection.

**Action 2.4: Improve staff welfare**

Staff welfare is a prerequisite to a productive workforce. Ideally, the output of a well motivated staff will be increased compared to one which is not. Provision of adequate welfare facilities including recreational facilities will keep the workforce engaged during their free time preventing staff from engaging in other unproductive activities. Both management units lack human resources officers and rely on their headquarters (area level) to handle all cases related to staff welfare. Consequently, staff welfare issues are not given due consideration since most issues are handled by the senior officers and in some cases by accounts clerks. To enhance staff welfare KFE management will do the following:

- ▶ establish health centres at Kibiri and Buyangu – these will be community based projects that will also provide health services to staff;

- ▶ provide sporting facilities at main forest stations and improve existing ones – this will include provision of indoor sports such as darts, pool, table tennis, etc; and
- ▶ improve staff administration and welfare – a shuttle bus will be procured for the Buyangu station to be ferrying staff and their family to buy domestic provisions. The existing welfare canteen at Buyangu will be improved and equipped with indoor sporting facilities. KFS will also establish staff canteens at Isecheno and Kibiri stations.

**Action 2.5: Ensure staff discipline is observed at all times**

Discipline in the uniformed staff cadre is critical and it needs to be observed at all times. Reasons for staff indiscipline are as a result of different aspects such as having negative attitudes on duties which could be attributed to, for example, lack of promotion or training. On the other hand, discipline could be caused by poor morale and lack of recognition of an employee performance and achievements. There is notable laxity in KFE amongst uniformed staff. Indiscipline could be in form of insubordination, poor handling of weapons or even poor mode of dressing amongst the uniformed staff.

Through this management action, a platoon commander will be deployed to oversee the uniformed staff and handle security cases in the KFS managed sectors. On the other hand, proper chain of command will be followed for reporting and acting on indiscipline cases that may arise. The platoon commander will be conducting weekly talks or whenever there is need, but the responsibility of ensuring the discipline of rangers will rest with the NCOs who will introduce daily talks. The corporals for example, are the ones who interact with the rangers on a daily basis and hence are in a position to ensure that rangers perform their duties with utmost discipline. The NCOs will be in a position to summon the rangers and conduct similar duties that are conducted by other disciplined forces such as, morning runs and military drills whenever appropriate. KFS lacks a code of conduct for uniformed staff and depends on the Kenya Police Code of Conduct. This creates a vacuum since the officers are not aware of this code and therefore there is no means of disciplining offenders from the uniformed staff. As such, an Orderly Rooms Proceedings (ORP) manual will be formulated for the uniformed staff under KFS in collaboration with KFS headquarters and plans for developing a KFS Code of Conduct will be initiated. Another option that could improve discipline and performance of staff is introduction of a reward scheme where staff who demonstrates extraordinary work performance are recognized and rewarded.

### **Objective 3: Adequate infrastructure for efficient management of KFE improved and maintained**

The desired future state of the KFE is one where essential infrastructure to support effective conservation of the KFE's exceptional resource values and forest administration is available. This will be realised by adequately equipping KFE management with reliable and appropriate tools and infrastructure to support delivery of expected services. Provision of adequate staff housing and administrative offices is essential to boost staff morale which ensures that forest management activities are well coordinated and facilitated. In addition adequate and reliable transport is needed to facilitate prompt response to issues in the forest ecosystem.

In order to realize the above-stated desired state, eight management actions focussing on improvement of infrastructure and communications have been proposed and they are described in the following sections.

**Action 3.1: Procure adequate vehicles, plants and machinery to support KFE operations**

Provision of adequate and reliable transport is an important aspect in protected area operations. The current transport situation in the ecosystem varies among the two management units. KWS has two serviceable Land-Cruisers and one motorcycle used for administration and security purposes. These are not adequate and it has been proposed that two additional Land Cruisers, one for PAC and the other for security, as well as a bus shuttle for administration purposes be acquired. Two motorcycles to complement and supplement the existing one are also needed to facilitate operations and security duties.

KFS is majorly constrained in all its stations affecting effective management and service delivery. At Kakamega forest station the only Nissan Double-cub pick-up vehicle is shared between the DFO Kakamega and the PFO and it is also used to facilitate vehicle patrols. This vehicle experiences frequent breakdowns due to over use and due to the fact that major vehicle repairs are rarely done on time. At Vihiga (Kibiri forest) the existing two vehicles are old, are frequently grounded, and have high maintenance and operation costs. They are supplemented with motorbikes reducing operational effectiveness. It is proposed that two land-Cruisers be acquired and deployed at Kibiri forest station to facilitate security operations. In addition, through this management action, the DFO and PFO will each be facilitated with a vehicle and two additional vehicles will be provided for security operations.

There are no plants for road works deployed at the KFE. KFS relies on Pan Paper Mills and the GoK for road work plants while Kakamega National Reserve relies on plants based at the Western Conservation Area Headquarters, Kitale. There is need to have plant and machinery for road works deployed at KFE to facilitate regular maintenance of KFE roads. Such plant could be shared between KFS and KWS and it could also be leased out when not in use.

**Action 3.2: Dispose unserviceable vehicles and machinery and ensure regular maintenance of existing fleet**

As indicated in Action 3.1 above, most of the vehicles and machinery are old and prone to frequent break-downs and thus uneconomical to run due to high maintenance costs. Both management units will endeavour to dispose of these vehicles, machinery and equipment in accordance with the Kenya Public Procurement and Disposal Act 2005. Each management unit (KWS and KFS) will establish a small mechanical workshop staffed with qualified personnel to undertake repairs and regular maintenance of vehicles, machineries and equipment thus saving on costs and promoting efficient service delivery.

**Action 3.3: Rehabilitate and maintain buildings**

The office buildings in KFE are generally in good condition with the KWS ones having been rehabilitated recently and others undergoing major repairs such as Biodiversity Information Centre (BIC) at the Kakamega Forest Station.

Staff housing at the KFE is inadequate. Most of the existing houses are run down requiring rehabilitation. Houses at Buyangu station are in good condition as they were rehabilitated during the reserve's branding. However, houses at Kakamega (DFOs) offices are dilapidated and lack utilities such as water and electricity. Similarly, other forest stations including Kakamega station, Kibiri and Bunyala lack these utilities. In addition, Malava and Bunyala forest stations have no offices but their outposts have houses that are dilapidated requiring demolition and replacement with new ones.

Consequently, through this management action, the ongoing construction works at Kakamega Forest Station will be completed and the DFOs' office block and Bunyala station that require repairs will be rehabilitated. In addition a sentry room will be constructed at the entrance to Kakamega Forest Station. Further, a station will be constructed to house and offer offices for officers in the Vihiga zone as they are under pressure to vacate the Vihiga District Headquarters.

The forest stations will be supplied with running water and electricity where these utilities are lacking. In addition all buildings will be rehabilitated and regular scheduled maintenance work carried out to ensure that they remain in good condition.

### **Action 3.4: Improve and ensure regular maintenance of the road network and river crossings**

The roads in the KFE cover approximately 54km. Some of these roads have been abandoned and others rendered impassable. However, all the forest stations are accessible. The road network is adequate for administration and tourism purposes as long as roads are maintained and upgraded to all weather condition. Hence, under this management action, the road network will be maintained through regular gravelling and grading.

### **Action 3.5: Improve waste disposal and sanitation for KFE staff quarters**

Sanitation is the hygienic means of promoting health through prevention of human contact with the hazardous waste. Lack of access to adequate water is associated with poor sanitation and has enormous health and economic costs for households, with consequences to the environment. Poor waste disposal at KFE staff quarters attracts wild animals such as primates, scavenging birds, and wild cats, which can be a nuisance to staff and their families. Inappropriate waste disposal for those living inside protected areas poses serious environmental hazards. Garbage seriously affects the sanitation aspects of natural water bodies (both surface and subterranean), as well as soil, vegetation, and the air.

Although there is no single completely safe method of waste disposal and given that all forms of disposal have negative impacts on the environment, waste management is paramount and an important aspect that promotes environmental health. Through this action, it will be important to create awareness for all staff and their families to change their behaviour and adopt a more responsible attitude towards sanitation. This will include having the management hold meetings at staff quarters and educate the staff and their families on better waste disposal and management. It will also involve inviting waste disposal experts to give environmental talks to staff. Moreover, staff will be encouraged to observe simple hygiene by either burning or burying waste, especially waste that could attract carnivores. Appropriate sites for waste disposal will be identified through expert advice. Basic sanitation will be ensured through provision of water supply to all staff houses ensuring that all staff houses.

**Action 3.6: Procure necessary fire fighting equipment for disaster preparedness**

KFE is not prone to forest fires due to frequent rain received throughout the year. Forest fires are known to cause serious damages and sometimes death especially if proper measures are not taken in advance. As such, KFE Management will aim to minimise the negative impacts of wildfires and promote the use of prescribed fires for ecological management purposes where necessary. Hence a fire management plan for the entire KFE complex will be developed; appropriate fire fighting equipment will be procured to ensure that KFE management is adequately prepared to deal with wild forest fires; and KFE staff will be trained on the use of these equipment and how to fight forest fires.

**Action 3.7: Lobby the mobile providers to install a Base Transceiver Station (BTS) to cover KFE**

Currently, cell phone signal reception at the KFE is poor hampering telecommunication. To address this problem, KFE management will request the mobile providers in the area to boost the reception of their frequencies by installing Base Transceiver Stations at strategic locations in the KFE. This will improve communication in the area and provide other opportunities such as internet connection through modems.

**Action 3.8: Equip and furnish Isecheno and Buyangu offices**

Adequate and up to date technology and equipment are vital for efficient service delivery. All the KFE management offices lack up to date basic office equipment and the existing furniture, in most cases, is worn out. Consequently, Isecheno and Buyangu offices will be fully furnished and provided with computers and their associated. In addition, internet connectivity will be provided.

## **Objective 4: Financial resources to support administrative and forest resource management functions provided**

The future desired state of KFE is one where financial resources for effective management of the forest ecosystem are available; all revenue due to the protected area is collected; expenditure is controlled and adheres to approved work plans; the procurement of goods and services is expedited; and funds are availed to support the implementation of this management plan. Efficient resource management will enable equitable benefit sharing between KFE and the adjacent communities.

This objective has therefore been designed to address issues concerning revenue and expenditure management to ensure sound financial management. The management actions that have been developed to realize this objective focus on: fast tracking the decentralization process in KFS to provide support staff; enhancing revenue collection systems and soliciting for funds to support the implementation of this management plan. These actions are elaborated further below.

**Action 4.1: Enhance revenue collection systems**

One of the common functions shared between KWS and KFS is collection of revenue as provided by their respective legal instruments i.e. the Wildlife Act Cap 376 and Forest Act, 2005. The main revenue streams for KWS is from visitation and accommodation at the Bandas and site lease fees, while KFS collects revenue from levies and royalties imposed on services such as water catchment conservation, land leases and concessions. In accordance to Sessional Paper No. 1 of 2007 on Forest Policy, revenue accrued through commercial forest activities should support the management and conservation of indigenous forests among other activities. Due to lack of stringent revenue collection system coupled with direct handling of cash, cases of revenue loss have been witnessed and it is foreseen to continue if nothing is done.

This Plan advocates for a transparent and accountable fee or levy collection system to ensure that all fees are collected and accounted for appropriately. Through this action, therefore, revenue collection will be strengthened and effective measures put in place to avert any leakage. In the mean time, this can be achieved if those in charge of managing KFE adhere to institutional financial regulations and procedures to reduce loss or misappropriation of funds. Other measures that will be employed to streamline revenue collection are; improving internal controls, computerising and updating financial record keeping, and improving the administration and monitoring of revenue collection through certified external accountants and auditors.

**Action 4.2: Use the management plan to solicit for external and internal funding**

The funding of forestry activities has mainly been from the central government (Treasury) and from development partners. Financial resource allocation for KFE activities is insufficient and at the current funding levels the KFE cannot fully implement programs and projects proposed in this management plan. This management plan seeks to expand the existing internal and external funding opportunities. The plan will make it easier for both KWS and KFS to develop activity plans and proposals for programs and projects suggested herein and will also increase the bargaining power for funding from external organizations. The KFE management will also encourage local community groups to develop proposals that can qualify for funding by both local and international funding agencies.

**Action 4.3: Establish a KFE Trust Fund that will incorporate all KFE stakeholders**

The current Forest Policy (2007) advocates for broadening the funding base for KFS through establishment of a national forest conservation and development trust fund among other fund raising tools. There is need to establish a local level KFE Trust Fund which will supplement the funds allocated by KFS and KWS Headquarters'. Such a fund is important as it is not affected by the government budget cycle, hence it is a reliable financial reservoir that can be resorted to in emergencies and can be used to address the multiplicity of issues and interests in the management of the KFE. Establishment of this fund will call for the involvement of all stakeholders. A proper administrative structure of the Trust Fund will have to be put in place to ensure prudent management of funds.

## Objective 5: Adequate resources for forest security operations provided

Security is crucial for safety of forest resources and visitors in KFE. It is therefore important to ensure that the required resources are provided to help counter security threats. These resources include vehicles, firearms, and other equipment necessary in security operations. This objective therefore aims to ensure that the safety of the KFE's natural resources, staff, visitors and assets is ensured, through the delivery of efficient, effective and adequate security services. In order to achieve this aim, the following actions have been developed that mainly focus on: ensuring regular patrols, establishing a Ticket Inspection Unit (TIU) to curb cases of revenue leakage, regulating livestock grazing and strengthening security patrol teams, among others.

### Action 5.1: Conduct regular patrols in security hotspots

KFE is home to a variety of wildlife species and birds of international recognition. It is a refuge to some of the rare, vulnerable and threatened wildlife species such as the red-tailed monkeys, blue monkeys, the common black and white colobus monkeys, and the rare De Brazza's monkeys. The habitats for these species are being degraded through uncontrolled human activities threatening their survival. Some of the threats include illegal activities such as bush meat poaching, charcoal burning, illegal grazing and over exploitation of the forest resources. The areas most affected by these threats include Shamiloli, Senyande, Chesero, Shikusa and Shanderema. To curb threats to wildlife and their habitats KFE management will intensify both foot and vehicle patrols. And to facilitate the patrols, the KFE security sections will be provided with all the needed transport and communication equipment to increase the success of security operations. In addition, outposts will be established in areas that face immense pressure from human activities.

### Action 5.2: Establish a Ticket Inspection Unit (TIU) for KFE

With increase in visitation that is expected upon implementation of management actions in this plan, it is expected that substantial revenue will be collected. To control revenue leakage and at the same time ensure that the visitor code is respected, there is need to designate a TIU for the KFE. Such a unit will be expected to ensure that all revenue due to the two institutions is paid and visitors do not flout the set KFE rules and regulations.

### Action 5.3: Regulate livestock grazing in KFE

Livestock keeping is one of the main economic activities of communities around KFE and an important source of livelihood. Almost all homesteads own livestock with some having large numbers and others small numbers. Due to population increase in the region, and the demand for land for cultivation, livestock owners are faced with inadequate land to graze. To counter lack of adequate grazing land some livestock owners resort to grazing in the protected areas leading to serious forest degradation. The KFE zonation scheme has designated some areas as Potential Utilization Zones where grazing can be allowed. As a result the community will be sensitized on the zonation scheme, to ensure that controlled livestock grazing is confined to the utilization zones. Sensitization will also be extended to educate the community on the best livestock keeping methods, in liaison with the Ministry of Livestock. In addition, the livestock

carrying capacity of the KFE will be established and this help set limits of acceptable use for livestock grazing.

### **Action 5.4: Strengthen the capacity of security patrol teams for KFE**

Currently, many KFE security staff lack basic training in important field skills such as the use of data collection tools, and also lack some essential field equipment, including binoculars, GPS, and in some cases, 4WD vehicles. As a first step towards addressing these issues, a training needs assessment of security staff will be carried out (in conjunction with Action 2.1), and priority training for security patrol teams subsequently initiated in accordance with the assessment's recommendations. This training will also include the use of GPS or other spatial data collection tools, which will support the establishment and continued use of the new security database that will be developed through Action 5.6 of this programme. In addition, and in order to enhance the mobility of security patrols, KFE management will liaise with their respective headquarters regarding the provision of additional heavy-duty 4WD vehicles to support ground patrols.

### **Action 5.5: Procure relevant security communication equipment, and field gear**

Rangers need to be equipped with the right security operation equipment for them to be efficient in executing their duties. Currently, the rangers lack appropriate operation gears to support their work. For example, the KFS team lacks a patrol vehicle and at times are forced to use a tipper, while the KWS vehicle is used for both security and other duties. On the other hand, KFS rangers do not have adequate communication equipment such as hand held radios. Hence, KFE management units will work collaboratively to improve the current communication shortfall at KFE. The offices and field outposts will be adequately equipped with VHF and HF radios (for headquarters') and a repeater that can be shared installed at an appropriate location, The rangers will be provided with adequate hand held radios with the requisite accessories such as chargers (solar powered) and batteries. Both KWS and KFS will share frequencies to ensure prompt response to emergencies and sharing of intelligence information. The patrol vehicles to be procured under Action 5.4 of this programme will be fitted with VHF radios for efficient and extensive communication coverage.

The operation teams also lack camping gear and thus cannot camp in hotspot areas where illegal activities are high as discussed in Action 5.1 of this programme. They therefore go for patrols with a vehicle or on foot and return to their base before dusk. Through this action the security team will be provided with basic equipment which will include: mobile tents, sleeping bags, gumboots, cooking appliances, raincoats and night vision equipment. The rangers also require appropriate uniforms and protective gear especially for handling animal carcasses. KFS ranger uniforms lack uniformity as the uniforms are not standardized. Some of the uniforms are old portraying a bad image for the service. As such, adequate and appropriately approved uniforms need to be provided to enhance KFE's image and ranger discipline. Other equipment that will improve the performance of the security division includes provision of adequate weapons (rifles), binoculars, Global Positioning Systems (GPSs), digital cameras and computers. Provision of these equipment will make security operations efficient and effective and also improve ranger morale. Security operations also need to be supported through provision of dry food rations to enable patrol teams to stay in the field longer.

### **Action 5.6: Establish a KFE security database**

Neither KWS nor KFS security departments have a security database in KFE. All information gathered by the security teams is sent to their respective headquarters where it is included in the centralised databases. A well developed and up to date database is an important tool for monitoring and assessing effectiveness of security operations. The database, for example, can be used to support planning of security operations and patrols, and to help identify the ideal location of any new security outposts or other security infrastructure that may be needed.

Consequently, the security teams at the KFE will establish computerised security databases. To start with, record keeping will be improved by ensuring that there is accountable record keeping documents such as the Occurrence Books (OBs), Fire Arms Movement book, Duty Register, and Patrol Register are available and in use by security teams. Rangers will be trained on how to fill the registers as well as other appropriate record keeping methods. Furthermore, data and information collected and entered in these record books will be digitised for ease of manipulation, analysis and retrieval. Key elements of this database are likely to include details on the patrols carried out each month (such as patrol route, observations made, and action taken where illegal activities are encountered), details on arrested individuals and any prosecutions, and intelligence information on wildlife-related illegal activities. Ideally the database will also incorporate a Geographic Information System (GIS) to facilitate the display and output of information in the form of maps. An elaborate and effective database will require proper data collection and record keeping which is a key challenge in KFE. Hence, given the nature of the administration of KFE, two databases will be created, one managed by KFS and the other by KWS but information sharing will be encouraged. Moreover, the KWS security database will be linked to the Management Information System (MIST) database that is being rolled out in all protected areas. Indeed most of the data collected during security operations and patrols can be handled by the MIST, hence non-confidential security information will be shared with the MIST.

### **Action 5.7: Collaborate with police and judiciary in enhancing prosecution of KFE offences**

Arrest and prosecution of cases has been a major concern for KFE rangers due to the ineffectiveness of the prosecution process. This can partly be attributed to existence of weak legislations, especially the Wildlife Conservation and Management Act CAP. 376, which provides for minimal fines and penalties for various crimes committed in protected areas. Although many arrests are made, often they do not lead to conviction of the culprits, or if they do, the penalty is often not deterrent enough. In addition, sometimes court cases are also lost due to poorly drafted charge sheets, which in most cases are done by the police. Lack of environmental awareness among the judiciary may also be blamed for dismissal of cases or meting out less punitive penalties.

Through this action, both KWS and KFS rangers will receive basic training on different environmental laws and drafting of charge sheets to increase success of prosecution of environmentally related court cases. KFE management will strengthen the existing collaboration with the police and judiciary, primarily to improve prosecution success and general understanding of the impacts of wildlife offences on the forest ecology. Consequently, KFE will take steps to sensitize members of the judiciary on the seriousness of the offences through organizing tours to the forest for them to appreciate the nature, extent and impact of illegal

activities on the forest ecosystem. Finally, KFE security officers will seek to be co-opted in the District Security Committee so that they can be articulating environmentally related security issues in this important committee.

**Action 5.8: Establish an effective Intelligence Network**

A good intelligence network is important in detecting and reacting to potential security threats within KFE. Hence, an intelligence network will be established to ensure that environmental crimes are prevented. The wildlife intelligence network will comprise of intelligence units from KFS and KWS that will be working with the local community to collect and collate information on environmental crimes. The two units will also be sharing intelligence information to increase the success rate of averting crimes in the KFE.

## Three Year Activity Plan

The following pages set out the first 3-Year Activity Plan for the Forest Operation and Security Management Programme. The activity plan details the activities, responsibilities and timeframe necessary for the delivery of each management action over the first 3-year timeframe of this management plan. In addition, the plan sets out specific and time-bound “milestones” that KFE management aims to achieve in implementing the plan.

Management Action and Activities	Persons responsible	Time frame												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
<b>Objective 1: Institutional partnerships and collaborations strengthened</b>														
<b>1.1: Enhance wider stakeholder participation in KFE</b>														
1.1.1 Identify KFE stakeholders their role and responsibilities	Warden, ZM													A thorough stakeholders analysis done and a database of KFE stakeholders in place by Dec 2012
1.1.2 Sensitize stakeholders to collaborate and participate in PFM activities														
<b>1.2: Establish a KFE Management Advisory Committee</b>														
1.2.1 Identify relevant stakeholders for membership	Warden, AD-WCA; ZM & HoC NEMA, NMK													KFE Management Advisory committee established by December 2012
1.2.2 Develop terms of reference for the KFE Management Advisory Committee														
1.2.3 Constitute the KFE Management Advisory committee and give them legal mandate to operate														
<b>1.3: Improve communication within KFE</b>														

**FOREST OPERATIONS & SECURITY MANAGEMENT PROGRAMME**

Management Action and Activities	Persons responsible	Time frame												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
1.4.1 Establish an effective communication and feedback mechanism between Headquarters and field and across departments	Warden, HoC, ZM, AD-WCA													Six (6) consultative meetings on communication channels held by June 2015
1.4.2: Establish a sound communication feedback mechanism across KFE departments/sections														
1.4.3: Hold regular consultative meetings among and between KFE stakeholders														
<b>1.4: Demarcate and carry out regular maintenance of the KFE boundary</b>														Six title deeds acquired by June 2015  Kakamega Forest reserve and Kakamega National Reserve boundary physically marked by June 2015  30% reduction in encroachment by June 2015
1.4.1: Audit geo-reference coordinates for all forest boundary beacons.	Warden, ZM, HoC, AD-WCA													
1.4.2: Physically mark the forest reserve - national reserve boundaries e.g. with boundary trees, NTZ buffer zone														
1.4.3: Acquire title deeds for all the gazetted forests														
1.4.4: Evict forest encroachers and squatters														
1.4.5: Regularly maintain the boundary														
1.4.6: Sensitise the forest adjacent community on the position of the boundary and safeguard it.														
<b>Objective 2: Staff welfare, training and motivation improved</b>														
<b>2.1: Conduct a workload and job analysis for both KWS and KFS</b>														Personnel evaluation report ready by Dec 2012
2.1.1: Undertake a study to establish optimal staffing levels for each cadre of staff	Warden, ZM, HoC, AD-WCA													
2.1.2 Liaise with respective Human Capital Departments to deploy staff in line with the recommendations of the study														
<b>2.2: Ensure continuous capacity building for KFE staff</b>														Training needs assessment report ready by June 2013
2.2.1: Conduct a Training needs assessment	Warden, ZM, HoC, AD-WCA													
2.2.2: Appoint and deploy qualified customer care staff														
2.2.3: Provide needed staff training & refresher courses														

Management Action and Activities	Persons responsible	Time frame												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.2.4: Define career development														Three refresher courses offered annually
2.2.5: Provide tools of trade including uniform														
<b>2.3: Improve on welfare provision for KFE staff</b>														
2.3.1: Rationalise staff allowance and ensure prompt payment	Warden, ZM, HoC, AD-WCA													Field allowances and salaries for KWS and KFS staff harmonized by June 2015 Two health centres established and one rehabilitated by June 2015 Three sports facilities provided by June 2015
2.3.2: Harmonise salaries and allowances between KWS and KFS														
2.3.3: Reward whistle blowers against illegal activities														
2.3.4: Facilitate the Community user groups' e.g. giving scouts a token of appreciation.														
2.3.5: Provide sporting facilities at main forest stations & KWS Centres improve existing ones														
2.3.6: Improve staff administration and welfare e.g. shuttle bus canteen and AFCO														
<b>2.4: Ensure discipline is observed at all times</b>														
2.4.1: Lobby for the formulation of KFS uniformed staff disciplinary code of conduct	Warden, ZM													Lobby documents presented to KFS Director by June 2013  Staff reward scheme established by June 2015
2.4.2: Lobby for the formulation of KFS uniformed staff disciplinary code of conduct														
2.4.4: Introduce a staff reward scheme for exemplary performance														
2.4.5: Conduct refresher courses for Human Resource issues e.g. Circulars and CUR														
<b>Objective 3: Adequate infrastructure for efficient management of KFE improved and maintained</b>														
<b>3.1: Procure adequate vehicles, plants and machinery to support KFE operations</b>														
3.1.1: Acquire two land cruisers, two motorcycles, a shuttle bus all for KWS and four 4-wheel vehicles for KFS	Warden, ZM, HoC, AD-WCA, Respective HQs													Appropriate vehicles procured by June 2013  One road maintenance equipment for the KFE acquired by June 2015
3.1.2: Acquire road maintenance equipment for the KFE														
3.1.3: Lease the road maintenance equipment when not in use to generate revenue														

**FOREST OPERATIONS & SECURITY MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Time frame</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.1.6: Construct entry gate/ revenue collection point in Isecheno barrier and after Rondo Retreat, Kambiri forest														
<b>3.2: Dispose unserviceable vehicles and machinery and ensure regular maintenance of existing fleet</b>												All unserviceable assets disposed off by December 2012 and a mechanical mini-workshop established by June 2015		
3.2.1: Dispose-off idle, obsolete or unserviceable assets	Warden, ZM, HoC, AD-WCA													
3.2.2: Establish a mini-workshop for maintenance of vehicles ,machinery and equipment														
<b>3.3: Rehabilitate and maintain buildings</b>												All buildings in KFE rehabilitated and well maintained		
3.3.1 Complete the ongoing construction works at Kakamega Forest Station	Warden, ZM, HoC, AD-WCA													
3.3.2 Rehabilitate DFOs' office block and Bunyala station														
3.3.3 Construct a sentry room at the entrance to Kakamega Forest Station														
3.3.4 Construct a station house and offer offices for officers in the Vihiga zone as they are under pressure to vacate the Vihiga District Headquarters														
3.3.5 Supply forest stations with running water and electricity where these utilities are lacking														
3.3.6 Rehabilitate all buildings and carry out regular scheduled maintenance work to ensure that they remain in good condition notable being staff houses in Isecheno and Kibiri forests														
<b>3.4: Improve and ensure regular maintenance of road network and river crossings</b>												All road network and trails rehabilitated and regularly maintained by June 2015		
3.4.1: Improve/maintain an all weather road network, paths, nature trails & river crossings	Warden, ZM,													
<b>3.5: Improve waste disposal and sanitation for KFE staff quarters</b>														

Management Action and Activities	Persons responsible	Time frame												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
3.5.1: Put in place sound waste disposal methods especially in KFS Quarters	Warden, ZM													Sound waste disposal methods in place as from December 2012
3.5.2: Create awareness for all staff on proper waste disposal and sanitation														
3.5.3: Install a regular water supply to all office and staff houses in the KFE														
<b>3.6: Procure necessary fire fighting equipment for disaster preparedness</b>														
3.6.1 Acquire forest fire fighting equipment	Warden, ZM, HoC, AD-WCA													Fire equipment; fire management training and watch towers provided by March 2014
3.6.2 Train the staff and surrounding community on fire fighting techniques														
3.6.3 Erect fire towers and identify high observation points														
<b>3.7: Lobby the mobile providers to install a Base Transceiver Station (BTS) to cover KFE and ensure internet connectivity to main offices</b>														Base Transceiver Station (BTS) that covers KFE and internet connectivity to main offices installed by December 2013
3.7.1: Lobby for the installation of BTS to enhance communication in the KFE	Warden, ZM, HoC, AD-WCA, Respective HQs													
3.7.2: Install and maintain efficient radio/phone systems														
3.7.3; Install a toll free 24 hr hotline and inform stakeholders about it														
<b>3.8: Equip and furnish Isecheno and Buyangu offices</b>														Modern office equipment , Furniture, ICT facilities and power connection by June 2013
3.8.1 Acquire modern office equipment , Furniture, ICT facilities and power connection	Warden, ZM													
3.8.2 Allocate funds for electricity connection to power ICT and other office equipment														
<b>Objective 4: Financial resources to support administrative and forest resource management functions provided</b>														
<b>4.1: Enhance revenue collection systems</b>														Smart card system for revenue collection introduced by June
4.1.1 Streamline revenue collection modalities	Warden, ZM, HoC, AD-WCA													
4.1.2 Improve internal controls														

## FOREST OPERATIONS & SECURITY MANAGEMENT PROGRAMME

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Time frame</b>												<b>Milestones</b>	
		FY 2012-13				FY 2013-14				FY 2014-15					
		1	2	3	4	1	2	3	4	1	2	3	4		
4.1.3 Computerise and update financial record keeping,														2013  Electronic log scale system introduced by June 2014	
4.1.4 Improve the administration and monitoring of revenue collection through certified accountants and auditors.															
4.1.5 Introduce smartcard system for revenue capture Ticket Inspection Unit (TIU)															
4.1.6 Introduce an electronic log sale system															
<b>4.2: Use the management plan to solicit for external and internal funding</b>														Three new funding raising opportunities identified and revenue generated from the same by June 2015	
4.2.1 Expand the existing internal and external funding opportunities	Warden, ZM, HoC, AD-WCA, KWS HQs Resource Mobilization														
4.2.2 Market carbon credits resulting from our forest resources															
4.2.3 Sell environmental goods and services e.g. water easement, BTS, ecotourism etc															
4.2.4 Encourage local community groups to develop proposals that can qualify for funding by both local and international funding agencies.															
<b>4.3: Establish a KFE Trust Fund that will incorporate all KFE stakeholders</b>														KFE Trust Fund established between July 2014 and June 2015	
4.3.1: Hold stakeholder meetings to sensitize stakeholders on the Fund	Warden, ZM, HoC, AD-WCA														
4.3.2 Prepare legalities on operationalizing the Trust fund															
<b style="color: green;">Objective 5: Adequate resources for forest security operations provided</b>															
<b>5.1: Conduct regular patrols in security hotspots</b>														At least two new outposts/high observation points established or revived and operational by December 2013 - Road barrier constructed at	
5.1.1: Identify biodiversity loss hotspots (to be informed by Action 1.2.2 of Ecological monitoring programme)	Warden, ZM CFA, Foresters														
5.1.2: Establish and revive outposts and high observation points (See the Zonation Scheme)															
5.1.3: Acquire Vehicles, communication and security equipment for policing the hotspots															

Management Action and Activities	Persons responsible	Time frame												Milestones
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
5.1.4 Construct a road barrier at Isecheno.														Isecheno by September 2012
5.1.5 Carry out joint patrols.														
5.1.6 Enforce the new grazing directive on livestock grazing in the forests														
<b>5.2: Establish a Ticket Inspection Unit (TIU) for KFE</b>													TIU established and operational by June 2014	
5.2.1 Initiate a Ticket Inspection Unit (TIU)	Warden, ZM, HoC, AD-WCA													
5.2.2 Enhance revenue collection modalities and minimise revenue leakage														
<b>5.3: Regulate livestock grazing in KFE</b>													Livestock grazing rules enforced and incidents of illegal grazing curbed by June 2015	
5.3.1: Sensitise the community on the best livestock husbandry	Warden, ZM, HoC													
5.3.2 Enforce the relevant legislature to control or stop grazing in the forest														
5.3.3 Zero rate cut and carry animal fodder														
<b>5.4: Strengthen the capacity of security patrol teams for KFE</b>													KFE security teams strengthened	
5.4.1; Train and equip the security staff on the use of GPS, Communication equipment, intelligence information gathering and investigation	Warden, ZM, HoC, AD-WCA													
5.4.2: Equip the security staff with tools of trade e.g. 4WD vehicles, GPS and Communication equipment														
5.4.3: Continually use a security database														
<b>5.5: Procure relevant security communication equipment, and field gear</b>													Appropriate equipments procured by June 2013	
5.5.1: Equip offices and outposts with VHF and UHF radios, handsets, repeater for communication and their accessories	Warden, ZM, HoC, AD-WCA													
5.5.2: Acquire adequate uniform and camping equipment for security officers														
5.5.3: Provide dry rations during operations														
<b>5.6: Establish a KFE security database</b>													A security database established and	
5.6.1 Avail appropriate record keeping materials	Warden, ZM,													

**FOREST OPERATIONS & SECURITY MANAGEMENT PROGRAMME**

<b>Management Action and Activities</b>	<b>Persons responsible</b>	<b>Time frame</b>												<b>Milestones</b>
		FY 2012-13				FY 2013-14				FY 2014-15				
		1	2	3	4	1	2	3	4	1	2	3	4	
5.6.2 Train security staff on recording of security information in the provided record materials	HoC, AD-WCA, SRS, KFS H-B													operationalized by June 2015
5.6.3 Provide a computer that will solely be for security officers and assign an officer to manage the security data														
5.6.4 Ensure entry of security information on the computer on regular basis														
5.6.5 Map illegal activity hotspots														
<b>5.7: Collaborate with police and judiciary in enhancing prosecution of KFE offences</b>														
5.7.1: Equip rangers with knowledge of the relevant legislature, court procedures and drafting of charge sheets. .	Warden, ZM, HoC, AD-WCA													Success rate for arrest and prosecution of arrested persons increased by 60% by June 2015
5.7.2: Create awareness for the judiciary and Police on the importance of environmental conservation and consequences of illegal forest activities														
5.7.3: Co-opt the KWS and KFS officers in the local District Security and Intelligence committees														
<b>5.8: Establish an effective Intelligence Network</b>														
5.8.1: Establish and sustain a KWS/KFS intelligence network	Warden, ZM, HoC, AD-WCA													Intelligence network for KFE established and operationalized
5.8.2: Involve the community in information gathering														
5.8.3: Set up a system of rewarding fruitful information relaters														

# Plan Monitoring

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## PLAN MONITORING

The plan monitoring framework set out in the following tables has been designed to provide guidance for the assessment of the potential impacts resulting from the implementation of each of the five management programmes. The framework sets out the desired positive impact of each programme's objectives as well as any potential negative impacts that may possibly occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation is a key aspect of the ultimate success of the plan and for informing adaptive management of the area, and as such ensuring that overall benefits from plan implementation are maximised, and that any negative impacts are appropriately mitigated.

**Table 17. Ecological Management Programme Monitoring Plan**

<b>Objective</b>	<b>Potential Impacts (<i>Positive</i> and <i>Negative</i>)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
<b>Objective 1: Species of special concern are protected and conserved</b>	Species conservation protocol for Kakamega Forest is revised and standardized	Appropriate conservation approaches developed and an inventory of taxa that have not been studied exhaustively conducted	KFE conservation approach report and inventory report of understudied taxa
	The de Brazza's Monkey population are increasing at target rates	Population size and recruitment rates	Population counts
	Stable population stands of <i>Prunus africana</i> trees in the KFE is increasing at target rates	Population stands and high canopy <i>Prunus Africana</i> trees	Extent and distribution of <i>P. africana</i>
<b>Objective 2: Natural habitats are sustainably conserved and managed</b>	Degraded forest areas identified and guidelines for rehabilitating developed	Area and sites of degraded forests mapped out	Satellite imagery and ground observations, composition and structure of characteristic plants species
	Ensure forest connectivity	Improperly forested sites reverted to enhance forest connectivity	Satellite imagery and ground observations
	Enhanced capacity for use of alternative nature-based forest resources by communities	Percentage acreage and number of community members practicing nature based farming	Ground observation, quarterly/annual reports from Forest zonal managers and KWS-CWS office

Objective 3: KFE ecological components, processes and dynamics understood and appreciated	A Scientific Advisory Committee formed	A committee that is inclusive of key researchers and institutions formed and clear roles and responsibilities clearly stipulated	Scientific advisory committee constitution report
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**Table 18. Tourism Development and Management Programme Monitoring Plan**

<b>Objective</b>	<b>Potential Impacts (<i>Positive</i> and <i>Negative</i>)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
Objective 1: Adequate administration and tourism support infrastructure is provided	Improved connectivity for visitors across the KFE	A foot bridge connecting the southern and northern, swinging bridge across the Yala River gate at Ikuywa and long trek trail from Isecheno to Kibiri constructed	Construction designs
	Environmental degradation from the construction sites	Evidence of pollution/litter or habitat degradation at the sites where activities or infrastructure development are taking place	Targeted inspections by KFE staff
Objective 2: Tourism activities diversified	Increased eco-cultural tourism activities amongst the community	Number of operational ecotourism ventures initiated and managed by the community	Record from Western Tourism Circuit offices on the number of applicants and ground checking
Objective 3: KFE Tourism promoted and marketed	Diversified tourism activities and attractions	Percentage of KFE visitors visiting the forest	KFE visitor database
	Increased number of visitors to the KFE	Annual visitor numbers	KFE visitor database
	Increased length of stay in the KFE	Average number of nights spent in the KFE per visitor or number of days per a visitor at a given time	KFE hotel occupancy/bed night fees and KFE visitor databases
	Visitor security incidents as a result of using additional attractions and activities across KFE	Number of visitor safety and security incidents	Incident reports

**PLAN MONITORING**

	<b>Environmental degradation from new tourist activities, attractions and/or supporting infrastructure</b>	<b>Evidence of pollution/litter or habitat degradation at sites where activities or infrastructure are located</b>	<b>Targeted inspections by KFE staff</b>
	<b>Intensified marketing campaigns for KFE</b>	<b>Local and international media coverage</b>	<b>Number of media coverage for the forest's activities such as cultural events, habitat restoration and research activities</b>
	<b>Improved visitor understanding of the KFE's ERVs, conservation issues and history</b>	<b>Number of guidebooks and maps sold (numbers visiting the KFE Information/visitor centre, if developed)</b>	<b>KFE tourism records (Information/visitor centre records)</b>

**Table 19. Forest Resource Management Programme Monitoring Plan**

<b>Objective</b>	<b>Potential Impacts (Positive and Negative)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
<b>Objective 1: To promote and enhance conservation and sustainable management of natural forest</b>	<b>Degraded forest patches are rehabilitated</b>	<b>Extent of natural forest</b>	<b>Satellite imagery and reports on forest restoration</b>
	<b>Communities are benefiting from the natural forest resources through non-consumptive utilization of forest resources</b>	<b>Harvested natural forest resources</b>	<b>CFA reports</b>
	<b>Unsuitably sited exotic plantations replaced</b>	<b>Harvested stands of unsuitably sited exotics</b>	<b>Satellite imagery and harvesting/rehabilitation reports</b>
<b>Objective 2: To maintain and enhance productivity of industrial forest plantations and increase efficiency in wood utilization</b>	<b>Tree nurseries are producing quality seedlings of diverse species</b>	<b>Number of viable seedlings available for planting</b>	<b>Tree nursery reports</b>
	<b>Silvicultural operations are carried out</b>	<b>Quantity and quality of products from silvicultural operations</b>	<b>Plantation management reports</b>
	<b>Plantation backlog is cleared</b>	<b>Extent of new plantations</b>	<b>Plantation establishment reports</b>

	Communities and private sector are benefiting from Plantation establishment	Number of modern processing technologies adopted through training and modern wood processing equipment acquired	Plantation management reports
	Environmental degradation as a result of clearing plantation backlog	Evidence of habitat degradation	Targeted inspections by KFE staff
Objective 3: Pressure on forest reserves reduced through promotion of farm forestry	There is increased production and utilisation of suitable multi-purpose tree species in the greater KFE	Percentage of farm plot under multipurpose trees	Farm forestry survey reports
	There is increased adoption of tree husbandry technologies in the greater KFE	Percentage of community who have adopted new tree raising technologies	Farm forestry survey reports

**Table 20. Community Outreach and Education Management Programme Monitoring Plan**

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Community participation, collaboration and natural resource management enhanced	Enhanced PA-community relations	Community attitude change	Community Knowledge, Attitude and Practices surveys
	CFAs strengthened and empowered	Active participation of CFAs in forest conservation	Number of projects and activities initiated by the CFAs
Objective 2: Community environmental education and sensitization programmes enhanced	Enhanced relationships between KFE management and surrounding communities	Incidences of KFE - community conflict	KFE Community Wildlife Service records
	Improved understanding of the KFE's conservation importance	Number of conservation related activities in KFE adjacent areas	KFE Community Wildlife Service records
	Reduced illegal natural resource use in the KFE	Number of local community members arrested for illegal natural resource use the in KFE	Security Section Records
Objective 3: Human-wildlife conflict minimized	Reduction of wildlife related costs to KFE adjacent communities	Incidents of human-wildlife conflict around the KFE	KFE Community Wildlife Service records (monthly reports and occurrence books)

**PLAN MONITORING**

<b>Objective</b>	<b>Potential Impacts (Positive and Negative)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
Objective 4: Financial resources to support administrative and forest resource management functions provided	Increased value and importance of the KFE to surrounding communities	Income from activities linked to the conservation of the KFE	CWS and Conservation CBOs reports
	Increased ownership of community projects	Number of community projects initiated by KFE that are well managed and improving livelihoods	KFE Community Wildlife Service records

**Table 21. Forest Operations & Security Management Programme**

<b>Objective</b>	<b>Potential Impacts (Positive and Negative)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
Objective 1: Institutional partnerships and collaborations strengthened	Enhanced management collaboration between KWS and KFS	Percentage of joint responsibility 3-year activity plan milestones achieved	KFE annual reports
	Increased stakeholder support for management of the KFE	Number of joint management meetings or other stakeholder collaboration events held	Meeting minutes or KFE management records
	Increased external financial support for KFE management	KFE revenue sources	KFE annual budget reports
Objective 2: Staff welfare, training and motivation improved	Improved efficiency of KFE staff undertaking their roles	Staff performance against 3-Year Activity Plan	KFE annual reports
	Improved morale of KFE staff	Number of poor morale related incidences	KFE staff discipline reports
Objective 3: Adequate infrastructure for efficient management of KFE improved and maintained	Improved visitor and management access across the KFE	Kilometres of trails constructed and/or improved	KFE management records
	Environmental disturbance trail construction	Evidence of excessive environmental damage	Targeted inspections by KFE
	Improved efficiency in management operations (especially security and PAC responses)	Ratio of operational to non-operational vehicles	KFE management records and/or periodic surveys

<b>Objective</b>	<b>Potential Impacts (<i>Positive</i> and <i>Negative</i>)</b>	<b>Verifiable Indicator</b>	<b>Sources and means of verification</b>
Objective 4: Financial resources to support administrative and forest resource management functions provided	Enhanced ability of KFE management to implement the plan	Percentage of 3-Year Activity Plan milestones achieved	KFE annual reports
	Enhanced revenue generation	Number and type of revenue streams and amount of revenue collected	KFE financial reports
Objective 5: Adequate resources for forest security operations provided	Improved management response to security or HWC incidents	Number of security and HWC incidences successfully responded to	Security reports and community surveys