CONSERVATION OF KENYA'S COASTAL FORESTS

SOCIAL ECONOMIC REVIEW

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1.0 **INTRODUCTION**

The coastal forests of eastern Africa cover six countries (Somalia, Kenya, Tanzania, Mozambique, Zimbabwe and Malawi). Most of these forests are found in Kenya, Tanzania and Mozambique. The northern limits are in southern Somalia close to the Kenyan border.

Though fragmented and small, Kenya's coastal forests are of critical importance to the country. They are situated at the centre of the country's tourism industry, it's largest foreign exchange earner. They are important water catchment areas for the rivers and streams on which the local people in the coastal areas depend on. They are also home to biodiversity and species of global recognition.

The Coastal forest resources in Kenya provide the basis for a number of different forms and scales of economic activity, which provides both food for national and international consumption. These resources and Mangrove forests which fall within the marine ecoregion account for a very significant part of a family's living at the coast. Practically, mangrove forests may be considered as part of coastal forests because of the close linkages between the coastal and marine ecoregions. Forests within the two ecoregions are under the same management, face similar threats and are utilized by the same communities. While coastal forests are terrestrial, Mangrove forests occur in the transition zone between dry land and Open Ocean.

Important mainstream livelihood activities along the Kenyan coast include; fishing, carving, agriculture, tourism, mariculture, harvesting of medicinal plants, salt production, harvesting of Mangroves and wildlife harvesting. Environmental values are also an integral component of livelihoods of many people at the coast.

The more common goods extracted from coastal forests include fuelwood, poles, timber, logs for carving, water, pasture for livestock, herbal medicine and honey. Some of the forests are of special socio-cultural significance to communities as they provide groves for worship, ceremonies, burial grounds, and meeting places for special occasions.

These coastal forest resources face many threats caused mainly by increased human activities. In general, habitat areas are declining and the area of agricultural land and land which is used for villages, tourism facilities, towns and cities is expanding. There are some suggestions that, in some cases in Kenya, there remains less than 20% of the coastal forests compared to the areas that existed in the early 1900s.

Threats on coastal forests include excision, unsustainable cutting of forest produce, overgrazing and charcoal burning. If these trends continue, there will be further reduction of forest cover, loss of biodiversity, water, soil erosion, and loss of land productivity that will impact negatively on livelihoods of neighbouring communities and on biodiversity conservation.

To address the above challenges, the WWF - East African Coastal Forest Ecoregion (EAFCE) programme was initiated in 2001 to support development of long-term regional programme strategy for the sustainable use of the coastal forests in the Eastern and Southern Africa. A draft EACFE planning document has been formulated. This paper is building on this document by revising the existing draft and filling in the gaps.

2.0 DESCRIPTION OF COASTAL FORESTS

2.1 Management of Coastal forests

Coastal forests fall under the following types of management.

Gazetted Forest reserves

These are forests that has been surveyed, demarcated and gazetted as Forest Reserves. The management of Gazetted Forest Reserves is vested in the Forest Department, Ministry of Environment, Natural Resources and Wildlife under the Forest Act 385. Examples include mangrove forests and Arabuko Sokoke forest (see Annex 1 for legal status of most forest areas).

Forests in National Parks

There are closed canopy forests gazetted as National Parks and National Reserves managed by the Kenya Wildlife Service (KWS) under the Wildlife (Conservation and Management) Act of 1985. Examples include Marine national reserves (e.g., Watamu Marine National Reserve) and Shimba Hills National Reserve. Shimba Hills National Reserve is also gazetted as a forest reserve.

Forests Gazetted as National Monuments

Since the early 1990s certain forests of cultural and biodiversity significance were gazetted as National Monuments under the Antiquities and Monuments Act and their management vested in the National Museums of Kenya (NMK). Key among these are *Kaya* Sacred forests. There are almost 50 Kaya forest patches scattered throughout the ecosystem, most of which are now protected under the Antiquities and Monuments Act.

Forests on Trust Land

A significant portion of forests at the coastal region is found in trust land. Management of these forests is vested in the respective Local Authorities under the Ministry of Local Government.

Forests on Private Land

There are also forest areas under private ownership, either as units held individually or within Group Ranches. Several forest patches such as Kaya Ganzoli/Galu, Tiwi, Waa, parts of Mwangea hill, and Chitzanze, are on private land. Others include commercial *Casuarina* plantations in Bamburi, managed by Bamburu Cement Factory Company Limited and some in Kwale District.

Collaborative forest management

The Government has recognized the need to involve other stakeholders in management of certain forest areas. For example, there are forest reserves of high biodiversity value that are managed by the Forest Department and the KWS through a Memorandum of Understanding (MoU) signed in 1991. The NMK became part of the tripartite MoU when it was added to the KWS/FD MoU in 1996. Included in this category is Arabuko Sokoke Forest. More recently, the government has recognized the need also to involve local communities in forest management, this is now being piloted in Arabuko Sokoke Forest.

2.2 Coastal Forest Values

2.2.1 Local community Level

Almost 9% of Kenya's population (2,622,794 out of 30,208,364) live in the coast province. The population density, relative to Central and Western Kenya, is sparse, especially in the semi arid areas such as Tana River and Kilifi/Malindi.

Kenya has experienced very hard economic times over the last decade, with an average Gross Domestic Product (GDP) growth rate of 1.1 over the last five years, which is below the population growth rate of 2.3%. The consumer price change over the same period has averaged 6.2%. This poor performance of the economy has resulted in most Kenyans being unable to afford food and other necessities, and the same is the case with the coast province.

The population of the coast province is generally poor. However, Tana River, Kilifi/Malindi and Taita Taveta are poorer than the national average according to many poverty indices, while Kwale and Lamu are better off. Table 1 below shows the level of poverty in the Coastal districts according to three poverty indices. Food poor refers to those, whose expenditure on food does not meet the recommended daily calorie intake, while absolute poor refers to those whose total income does not meet their daily needs including food. Hardcore poor refers to those who cannot meet their daily calorific requirements even if all their income was spent on food.

Table 1: Relative poverty indices for the districts in Coast province

District	% Food Poor	% Absolute Poor	% Hardcore Poor
Kilifi/Malindi	65.35	66.88	43.02
Kale	31.77	40.23	26.17
Lamu	24.2	29.53	20.52
Taita Taveta	42.61	50.65	33.33
Tana River	70.55	71.76	51.25
Coast Average	50.95	55.63	36.53
National Average	47.19	46.75	29.19

The high levels of poverty in the region means that the population is highly dependent on forests resources for their daily needs. These include food, medicines, and general livelihoods, which may be destructive to the environment. Agriculture and pastoralism are the major livelihood source for most people at the coast. This sector, however, is characterized by inappropriate land use practices resulting in degradation and loss of land productivity.

Wood products

Coastal forests have been exploited for hard wood timber for at least the past 100 years and have provided a source of poles and cooking fuel for much longer (Burgess, et al, 2000).

Energy

Wood fuel is the dominant source of energy for the coastal people, and accounts for 90% of rural household energy, and 85% of urban household energy consumption volumes. In the urban centres, charcoal is the most used fuel for cooking, while kerosene is used by both urban and rural households for lighting.

The high levels and continued use of wood energy means that there is great pressure on the forest resources to provide the energy needs. Most of the energy consumption is met from unprotected forests, and forests on private land. These now act as a buffer to protected area forests, but once these resources diminish, the population is likely to turn to the protected areas for livelihoods.

Carving

Brachylaena huilliensis "Muhugu" and Mpingo are major sources of carving material, though harvested illegally. Most of the "Muhugu" is obtained from the Arabuko Sokoke Forest.

Poles

Coastal forests species used as poles vary somewhat in different forests, although the best poles come from mangrove forests. Other tree species widely exploited when they occur are *Scorodophloeus fischeri* and *Cynometra webberi*.

Mangrove exploitation

The Kenya coast has a total of 9 mangrove species namely *Rhizophora mucronanta, Sonneratia alba, Bruguera gymnorrhiza, Ceriops tagal, Xylocarpus granatum, Heritiera littoralis, Lumnitzera racemosa, Avicenia marina, Xylocarpus moluccensis and Rhizophora mucronata* (mkoko in Swahili which is the most dominant in Kenya). The mangrove swamps cover approximately 53,000 hectares with the largest stand occurring in Lamu area and Vanga funzi coastal system near the Kenyan-Tanzanian boarder. The mangroves forest around Lamu is the second largest on the Eastern African coast and amount to 460 km^2.

Local communities are dependent on mangroves for timber, poles, fuel wood, charcoal, tanning and other products. Poles from mangroves from the coast have for a long time been used for wall and roof construction for Swahili style houses and as props/temporary support in concrete buildings.

Mangroves are also used as building materials for boats (*Sonneraia alba* is used for ribs of boats while *Heretiera littoralis* is used for boats though it is very scarce in Kenya. Large trunks of *Avicennia marina* are used to make dug out canoes.)

Harvested mangrove poles from the coast are used locally, others are exported to Middle East countries. The total number of mangroves poles sold in Mombasa ranges from 6,500 score (bad year) to 14,000 scores (good year). Wass (1995) estimated a total of 3,262,000 poles (equivalent to a volume of 24,262 m^3) to be consumed annually in house building. More recently demand has grown for poles in the hotel industry. Hotels and Villas consume larger sizes of poles than traditional house construction (Gachanja and Violet, 2001).

Mangroves also provide;

a) Honey (high quality honey from mangroves is sold in Malindi),
b) Fishing net floats,
c) Medicine from barks and sometimes fruits of various tree species,
d) Green manure,
e) Employment (for government and private especially pole cutters, fisheries industry, tourism industry and even those who sell mangrove poles.),
f) Fisheries (fish use mangrove areas and creeks as shelter, feeding and nursery grounds),
g) Oysters (Oysters fix themselves on mangroves predominantly *Sonneratia alba* and *Rhizophora mucranata,*
h) Chale Island mangroves are the only mangroves used as Kayas.

Utensils/handles

Many of the cooking utensils and handles of tools used in villages are made from hardwood that often come from forests. Coastal forest species used for these purposes are: *Markhamia zanziibarica*, *Diospyros verrucosa*, *Hymenocardia ulmoides* and *Loranthus hildebrandtii* (Lagerstedt, 1994).

Spiritual Value

The Kayas are small sacred forests of the coastal people. They are mostly found in Kwale and Kilifi Districts. The forests once sheltered the fortified villages of the Mijikenda (Digo, Duruma and seven groups of Giriama). They were protected by custom and used for ceremonies and cerebrations. The Kayas remained the spiritual center of each group of Mijikenda, sheltering the graves of important elders, and the traditional carved memorial posts (Vigango).

Non-woody forest products

Coastal forests also provide people living around them with non-woody products. Such products include Gum copal, which has ever been traded, mainly to India and the Arabic nations to make varnish and incense. In addition, plants from coastal forests have continued to form a significant proportion of the medicine available to surrounding populations. Food is another product provided by coastal forests. In Kenya, 60% of the people living adjacent to the Arabuko Sokoke Forest use it routinely for fruit collection, mainly for personal consumption (Mogaka, 1992; Wass, 1995). Edible mushrooms are widely collected from coastal forests.

Bush meat

In many coastal forests, the wild animals are hunted to provide meat for local populations. For, example, around 60% of households living adjacent to the Arabuko Sokoke Forest, hunt these regularly, and in 1991 about 350kg meat/km^2 forest was harvested, with an estimated value of KShs 1,306,000 per annum (c.$35,000) (FitzGibbon *et al.,* 1995).

Wild honey

Importance of wild honey varies greatly. In the Arabuko Sokoke Forest, 30-40% of people collect honey from the forest (Mogaka, 1992). In most coastal forests, honey collection is opportunistic from naturally occurring hives and the honey is consumed by the collector's family or traded for other goods.

Income

Some of the coastal forests are providing income to local communities through their engagements in conservation initiatives. Butterflies at Arabuko Sokoke Forest are being utilized for the benefit of local communities through the Kipepeo project. Through this project, farmers living around the forest generate income from raising and exporting butterflies. In 2001, the communities around Arabuko Sokoke Forest, earned around 37,000 dollars from guiding, bee-keeping and butterfly farming. In Shimba Hills, local communities have established an elephant sanctuary, the Mwaluganje Community Elephant Sanctuary that is providing them with incomes.

Fishing

The ocean environment and its biodiversity have been important to the coastal communities, around which their socio-economic life revolves. Fishing activities involve the use of forest-based products such as durable wood and wax, thus mangrove habitat degradation of the ocean environment and its resources has great negative ramifications on the lives of the local people.

Mining
Coastal forests have in the last few decades been mined where the mineral interest of a forested area is high. Mining activities are taking place in Mrima Hill in Kenya.

Water
Coastal forests are major sources of water that sustains the local people and wildlife therein. Arabuko Sokoke Forest has several natural wells and springs that the local people use as water sources.

Grazing
Coastal forests are used for grazing especially during the dry season by pastoral communities.

Other miscellaneous uses
Other miscellaneous uses of coastal forest plants include: smoke from the bark of *Caloncoba welwitschii* is used to sedate bees; mosquito repellants are made from leaf infusions of *Tetracera boiviniana* and *Keetia zanzibarica*; stem pieces of *Psiolotrichum scleranthum* are used to make toothbrushes; shampoos and soaps are made from the sedge *Kyllinga cartilaginea*; glue is collected from *Ficus sycomorus* whereas the bark of *Vismia orientalis* is used by women to make dye for coloring reed mats; grass species e.g., *Paspalum glumaceum* are used as roof thatch; twigs of *Combretum apiculatum* are used in basket weaving and some species are used to make ropes.

2.2.2 Macro/National Value of Coastal forests

Tourism
Coastal forests are important particularly through their linkage with tourism, which contributes a substantial percentage to the national economy and provides livelihood to a large population at the coast. Due to their proximity to Mombasa and Malindi, they are important tourist destination areas. Tourism development is well established in two of these forests, Shimba Hills and Arabuko Sokoke Forest Reserves. In the two, roads, foot trails, camp-sites, car-parks, gates and signs facilities are available. Revenue is mainly collected for entrance and use of other facilities. Some of the coastal forest are being developed for ecotourism. For example in Arabuko Sokoke Forest, these include forest walks and scenery attractions. Birds and butterflies are also being exploited for ecotourism.

In many of the coastal forests there is growing potential for ecotourism indicating good potential for both specialist and non-specialist forest tourism.

Mangrove forests offer tourist attraction especially where there is bird life and mammal life like Ramisi in South Coast, Tana River, Gazi, Mida Creek and Kipini where bird life, mollusks and crustacea and crocodiles are found.

Mining
Mining not only supports the local economy, but also generates income to the national economy. Silica sand for glass manufacture was formerly mined in Arabuko-Sokoke Forest (the old sand quarries have since become a distinctive biodiversity site within the forest, especially for frogs and birds) (CEPF 2003). Extensive salt works have been established at various sites (e.g. at Ngomeni, Gongoni and Kurawa), where they have been responsible for local destruction of mangrove forests.

Limestone deposits are abundant along the coast. They form a 4-8 km band, parallel to the coast and about 70 m thick from across the Kenya-Tanzanian border north to Malindi. All along the coast, coral limestone is quarried as building blocks, but there is local variation in limestone quality, affecting its potential use. In

Tiwi on the south Kenyan coast it is used for lime manufacture. In the Bamburi area just north of Mombasa, limestone is quarried on a large scale for cement manufacture by a subsidiary of La Farge, a French-based multinational. This site at Bamburi has become famous for its ecological restoration of quarries.

Other coastal mineral resources of minor local importance include barites, galena, iron ore, gypsum and rubies. However all of these may be dwarfed by the development of titanium mining. There are vast titanium reserves in the Magarini Sands belt, which stretches from Shimoni in the south coast to Mambrui in the north. Titanium has traditionally been used to make a white pigment for paint, plastic and paper, but is increasingly in demand for applications in the armaments and space industries. Since 1995, a Canadian-based company (Tiomin Resources Inc.) has been negotiating an agreement with the Kenyan government to mine titanium. Tiomin hopes to start its activities in the Kwale District and expects to generate around $47 million in annual cash flow.

Woodcarving

Woodcarving industry at the coast has a big potential in generation of wealth and employment. Currently the industry generates between US $ 20 - 25 million annually in export revenues. Its characterized by carved bowls, rhinoceri and giraffe's products. Main species being exploited at the coast are *Brachylaena huillensis* mainly from Arabuko Sokoke Forest and *Combretum schumanii* (Mkongolo). Wood carving species such as *Dalbergia melanoxylon* (African black wood - Mpingo) has been depleted from source areas.

Genetic resources

Some of the plant species within the coastal forests could represent important genotypes of commercial crops. The most important of these may be *Coffea spp.*, some of these are caffeine-free varieties not yet exploited for these properties.

Other values

Coastal forests are home to many of the regions and global threatened species, they ameliorate local climate and are catchment areas. They also are leisure and holiday centres, have unexploited pharmaceutical potential, support development and energy sectors and are research and knowledge fronts.

2.2.3 Regional Level

Regional Trade

Coastal forest resources at traded at the regional level. For example, Ebony – a threatened hardwood in Tanzania that is popular in the wood caving industry – is traded in Kenya markets.

Biodiversity

At the regional level, coastal forests contain 70% of the region's endemic plant species and 91% of its endemic genera. In addition, 42.4% of the region's endemic species (544 species) and 69% of its endemic genera have only ever been recorded from forest, and are therefore considered to be forest dependant (Clarke et al, 2000). The majority (67%) of the coastal forest regional endemic species and 61% of the endemic genera are confined to the Kenyan and Tanzanian coastal zone. The Kenyan coastal forests have high geographic concentrations of vascular plant species endemism.

2.2.4 Global Economy and Environment

Biodiversity Value

Half of Kenya's threatened woody plants occur in Coastal forests (Wass, 1995). Overall, of the forest-dependent and nationally threatened species in Kenya's forests, about 50% of the plants, 60% of the birds and 65% of the mammals are found in the Coastal forests, which show the importance of this region despite its relatively small forest cover.

The Kenya coastal forests are part of the East Africa Coastal Forest (EACF) hotspots. Conservation International ranks it 11th in species endemism. It is ranked by WWF as among the top 200 out of the worlds 850 ecoregions that are most important for global biodiversity conservation. The region contains many strictly endemic species, comprising 1,366 known endemic plants and 100 endemic animals, and shares many species with the adjacent Eastern Arc mountain ecoregion that is also of global biodiversity significance. In the whole EACF ecoregion, there are more than 4,500 plant species in 1050 plant genera with around 3,000 animal species in 750 genera (WWF-US 2003). The Kenyan Coastal forests have more than 554 strictly endemic plants (40% of the total) and 53 strictly endemic animals. (Ref)

According to Burgers and Clark (2000) and CEPF (2003), the area is considered to be a major global conservation priority because of the high endemism and severe degree of threat. It has a high congruence for plants and vertebrates, and ranks first for densities of endemic plants and vertebrates out of the 25 most important global biodiversity hotspots. This is because of the number of endemic plant and vertebrate species per unit area (Myers *et al*, 2000). The range of some of the endemic species is small, and single site endemism is common.

The range of biodiversity in each forest depends on the area, climate and productivity of the site. The largest of the forests is Arabuko Sokoke, which is ranked as the second most important forest for conservation of bird species in Africa. About 230 bird species have been observed in the forest, including six globally threatened species (Clark's Weaver, Sokoke Scopes Owl, Amani Sunbird, Sokoke Pipit, the Spotted Ground Thrush – a rare immigrant, and the East Coast Akalat). Some 52 known endangered mammal species have also been recorded in the forest, including two taxa that are globally threatened (the Golden Rumped Elephant shrew and the Sokoke Bushy tailed Mongoose). It has a diverse fauna of reptiles and invertebrates, more significantly 250 species of butterflies of which four are endemic. There are over 600 plant species, among them 50 that are globally rare. Forests such as Shimba Hills has just as high a degree of endemism as Arabuko Sokoke.

Mangrove forests are an important habitat for a variety of terrestrial and aquatic plants and animals. Terrestrial fauna include many species of birds, reptiles including crocodiles, mammals (pigs and monkeys) and insects; while terrestrial flora mainly comprises fungi, lichens and mistletoes. At the Tana River near Kipini as well as at the Ramisi River, the animal life is abundant when compared to other mangrove areas in Kenya. Very large crocodiles are very evident here as are herds of hippopotamus. Other smaller mammals found in the mangroves of Kenya are baboons, duikers, rodents and fruit bats. Bird life is rich and most varied in most mangrove forests but especially so in mida creek. Aquatic flora and fauna are much more diverse. Many (possibly up to 90%) of the species found in the mangrove forests are known to spend their entire life, or atleast a major part of their life cycle in these areas. These species include a number of prawns (*Penaeus indicus, P. monodon, P. semisulcatus, Matapenaeus monoceros*); crabs (*Scylla serrata, Uca spp., Sesarma spp.* and *Birgus latro*); mollusca (oysters such as *Brachydontes spp.* and *Crassostrea cucullata;* and cockles, Donax spp.).

The Tana riverine ecoystems is also rich in biodiversity. A total of 57 mammal species have been identified in Tana River Forest Reserve. These ecosystems provide the last refuge for the endangered Tana River Crested Mangabey *Cercocebus galeritus galeritus,* Tana River Red Colobus *Colobus badius rufomitratus,* De winton Long-Eared bat *Laephotis wintoni* among other rare species in Kenya.

Apart from the two primates, there are few endemic and vulnerable plant apecies in the reserve. Such species include *Coffea sessiliflora Subsp. Sessiflora, P. msolo, Pavetta sphaerobotrys, subsp.tanica, populus ilicifolia* and *Oxystigma*.

Over 300 bird species have been recorded in the riverine ecoystem. There are two threatened bird species in this area, malindi pipit and the East Coast Akalat, *Sheppardia gunnifi*. Tana River system also harbours about 60 primary fresh water fish species.

Coastal forest biodiversity have global pharmaceutical potential that is largely unexploited, hence the need to conserve it.

Climate Change

By acting as carbon sinks, coastal forests and mangroves reduce emissions of greenhouse gases from the atmosphere, therefore reducing global warming that is associated with devastating climate change impacts.

3.0 ANALYSIS OF MAIN STAKEHOLDERS

Coastal forests stakeholders include government departments/agencies, Non Governmental Organizations (NGOs) and Civil Society Organizations, regional institutions, private individuals, companies and users (including local and international). Annex 2 presents institutional problem analysis of some of these stakeholders.

3.1 Government agencies

In Kenya, there is a great deal of overlap in the institutional planning, implementation, management and monitoring of environmental policies and legislation. In 1992, the National Biodiversity Unit included no less than 38 government ministries, departments and parastatal institutions dealing with biodiversity issues. There are four government institutions that are directly involved in forest management and conservation: the Forest Department, KWS, the Kenya Forestry Research Institute (KEFRI) and the NMK. At a few sites, all four are represented in multi-institutional management teams (e.g. the Arabuko-Sokoke Forest Management Team at Arabuko-Sokoke Forest). Recently, the government created the National Environment Management Authority to coordinate all maters of environment in the country.

The Forests Department

The Forest Department has the major mandate. It falls under the Ministry of Environment and Natural Resources (MENR) and is responsible for:

- formulation of policies for management and conservation of forests;
- preparation and implementation of management plans;
- management and protection of Kenya's gazetted forests;
- establishment and management of forest plantations;
- promotion of on-farm forestry; and
- promotion of environmental awareness.

The Forest Department operates some 160 forest stations, reporting to 65 District Forest Offices which in turn report to eight Provincial Forest Offices. In the past, the department has concentrated on industrial forestry, but is now giving greater attention to afforestation on smallholder farm land and the

conservation of natural forests. The department has many problems. Resources are limited and staffing levels are inadequate to keep the department fully operational. A high percentage of the department's total budget goes to salaries and allowances. There are plans to transform the department into a new body called the Kenya Forest Service.

The Kenya Wildlife Service (KWS)
The KWS is a parastatal and is responsible for the protection of the nation's wildlife. On December 5th 1991, the directors of KWS and the Forest Department signed a MoU, covering the management of selected indigenous forest reserves. Within this MoU, the major responsibilities of KWS are the management of tourism, problem animals and wildlife protection. The NMK was subsequently included in the MoU under an addendum that recognized its role in cataloguing, researching and conserving forest biodiversity.

Unfortunately, policy and legislative framework to operationalise MoUs is lacking. Capacity to operationalise the MoU also does not exist, hence institutional rivalry and conflict characterize the operations of KWS and Forest Department.

Kenya Forestry Research Institute (KEFRI)
KEFRI was established in 1986. Its mission is to enhance the social and economic welfare of Kenyans through user-oriented research for sustainable development of forests and allied natural resources. KEFRI has five programme areas; Plantations; Natural Forests; Dryland Woodlands Forestry; Farm Forestry and Information Dissemination.

In 2002, it had 94 university graduate research scientists at PhD, MSc and BSc level, in 17 research centres in various ecological zones of Kenya. The Gede Regional Research Centre at the coast is responsible for research in the coastal forests.

The National Museums of Kenya (NMK)
NMK falls under the Office of the Vice President and Ministry of Home Affairs. NMK is mandated under the National Museums Act (Cap. 216) to serve as a national repository for things of scientific, cultural, technological and human interest. Additionally, the Antiquities and Monuments Act is implemented by the NMK. NMK has therefore been responsible for the surveying and gazetting of sacred coastal forests as national monuments, through the Coastal Forest Conservation Unit (CFCU).

The National Environment Management Authority (NEMA)
NEMA was established by the Environmental Management and Co-ordination Act (EMCA), 1999. According to the Act, NEMA is a corporate body to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.

Several committees are established under NEMA including the National Environment Action Plan Committee, which shall prepare a national environment action plan for consideration and adoption, by the National Assembly. The Standards and Enforcement Review Committee, which shall advise NEMA on criteria and procedures for the establishment and measurement of, water quality standards.

Other institutions established under the Act include the National Environment Trust Fund, Provincial and District Environment Committees, the National Environment Restoration Fund, the Public Complaints Committee and the National Environmental Tribunal. The National Environmental Tribunal shall investigate environmental matters forwarded to it by NEMA.

With respect to forests and forest conservation, EMCA gives every Kenyan: locus standi; provides for protection of forests; allows the Director General to enter into contractual agreement with private land owners with a view to declaring such land forest land and provides for Environmental Impact Assessment (EIA) of forestry related developments. However, the role of NEMA is limited until the many guidelines and procedure are developed. In view of this, speedy capacity building for NEMA to be able to implement this important mandate is critical.

Local Authorities

At independence, all land that was not in private or government ownership became Trust Land and was vested in the relevant Local Authorities to be used for the benefit of the residents of the area. According to the Statistical Abstract (GoK 1999) an estimated **78% of all the land in Kenya** is Trust Land. Currently, there are 167 Local Authorities including County, Town, City, Urban and Municipal Councils. The Local Authorities are mandated with the management of natural resources within their jurisdiction.

Regional Development Authorities

The management planning for the country's river basins is vested in regional development authorities, which are parastatals established through specific Acts of Parliament. The most relevant at the coast is Tana and Athi Rivers Development Authority.

According to the statutes, the functions of the regional development authorities include assisting operational agencies in their application for funds and causing the construction of any works necessary for protection and utilisation of the water and soils of their respective regions.

The activities of River Basin Development Authorities, especially the construction of hydro-electric dams and irrigation projects along the rivers have implications especially for riverine forests. Coupled with land use changes upstream and the degradation of catchment areas, these projects result in altered volume and regularity of water flow and siltation levels which affects both riverine forests and the ecology at the river mouth which in turn affects the flora and fauna e.g. Mangrove forests.

Another development authority at the coast with wide mandate is the Coast Development Authority (CDA) which coordinates development and projects in coast province.

3.2 Non Governmental Organizations

In the recent past, NGOs have greatly assisted the Forest Department. NGOs lobby the government on environmental policies and decisions; take decisions and act in response to emergencies or changing circumstances; are often closer to the grassroots and have a stronger relationship with communities; are often motivated by strong convictions and are therefore highly committed; are increasingly part of a supportive international network, which can quickly share knowledge and experience on environmental issues and which has a global voice (CEPF-EP, 2003)

In Kenya, the main active local NGOs on coastal forest management issues are Nature Kenya, the Kenya Forests Working Group (KFWG), A Rocha Kenya (ARK) and Forest Action Network (FAN). International environmental and conservation NGOs working or contributing to forest management in the region include African Wildlife Foundation (AWF); African Conservation Centre (ACC); BirdLife International; CARE International; Environmental Liaison Centre International; the IUCN East Africa Regional Office (IUCN-EARO); and WWF-EARPO. WWFEARPO is spearheading the Eastern Africa Coastal Forest Programme in Kenya through the EACFE programme that was initiated in 2002. Currently, WWF is formulating a programme for coastal forests

3.3 Regional organizations

Kenya is a member of several regional organizations like East African Community (EAC), COMESA, African Unity (AU) and New Partnership for Development (NEPAD). These organizations promote development in the region, for example, EAC is an intergovernmental organization with the mandate of promoting regional integration and development among member states (Kenya, Uganda and Tanzania). The main focus of EAC's is policy harmonization and development of economic infrastructure.

3.4 Private individuals or companies

People living around coastal forests are major stakeholders in their conservation. They play different roles ranging from engaging in forest destructive activities to activities that reduce pressure on forest resources e.g. relying on trees from farms and alternatives to forest products. There are also private companies that are important; these include the Bamburu Cement Company that is involved in rehabilitation of cement-mined areas using *Casuarina*. This has reduced over dependence of forests for poles. Tiomin Company is another private company that is expected to play key roles in coastal forest conservation through rehabilitation of areas where mining will take place.

3.5 Local and international users

There are other stakeholders who through using coastal forest resources are important in their conservation. These include local and international users who benefit from goods and services offered by coastal forests. These services include the fresh air and water.

4.0 MAIN CHALLENGES AND THREATS TO CONSERVATION AND SUSTAINABLE MANAGEMENT OF NATIONAL COASTAL FORESTS FROM A SOCIO-ECONOMIC PERSPECTIVE

Human Population

Population increase and the associated expansion of subsistence agriculture, which permanently converts natural habitats to farmland is a major threat to coastal forests. Population increases are also linked to habitat degradation associated with increased demand for firewood, charcoal, timber, fuelwood, and bushmeat.

The above is compounded when rural people out of employment are involved in commercial activities such as industrial fuel wood collection, commercial pole cutting and charcoal production as is observed in Kwale District.

Charcoal burning

Unlike sustainable logging, charcoal burning is a serious threat to Coastal Forests because of the high demands for charcoal in urban centres and for the illegal but lucrative export market. In Kwale, it has been estimated from District Forest Officer permit records that 45,000 bags of charcoal were legally transported from Kwale to Mombasa every month in 2001. Illegal movements are estimated to be more than three times as high. The charcoal mainly comes from Trustland forests, forests on private farms and ranches, and some illegally from gazetted forests. Charcoal burning is also widespread in the other coastal districts of Malindi, Lamu and Kilifi. The solution to the problem lies in establishing fast growing plantation species for charcoal production to relieve the pressure from the natural forests, promoting improved kilns, and introducing affordable alternative fuels.

Declining respect to traditional forest protection systems
Over the past few decades, more formal education, and government policy aimed at reducing dependence on witchcraft, has led to an increasing disregard for traditional values and a decline in respect for elders. As a result, the kayas are vulnerable to commercial exploitation and encroachment when traditional leadership breaks down. The young local generation and immigrants are clearing the Kayas for agricultural land. The recent adjudication exercise in the trust lands also set some Kayas as community land but the boundaries left the forests smaller than the original Kayas as the new boundaries were not the traditional boundaries.

Wildlife damage
Elephants have contributed to wide scale destruction of indigenous forests in Shimba hills (Mwaluganje area).

Development in Tana River
The population of red Colobus and crested Mangabey has been declining over the years since 1972. The 1994 census estimates 1100 and 1300 for the red Colobus and 1000 and 12000 for the Mangabey showing a decline of 10-30% and 46-56% respectively.

The decline in population of endangered and endemic species is attributed to development of Tana River, which affects the natural dynamics of the riverine ecosystem. The main threat to all primates in Tana is forest depletion through excessive use of forest products both inside and outside the reserve.

Forest encroachment
There has been increasing demand for conversion of forestry land to agriculture and settlements and other land uses. There is increased pressure for settlement in Arabuko Sokoke (mida creek area) and Manduguni forests. Though efforts for settlement in Arabuko Sokoke Forest were thwarted, the situation is different in Manduguni Forest where some families have encroached into this forest.

Forests on trustlands and ranches are converted to agriculture to cope with the demand for food arising from population growth. A contributing factor is low farm productivity, resulting from inappropriate agricultural practices. To mitigate this threat, it is necessary to improve land use and cropping practices, provide alternative livelihoods, curb high population densities around the forests, and to improve environmental governance.

Inappropriate land use systems
Lack of a comprehensive national land use policy has led to clearing of forests especially those on private lands. Settlement in these cleared lands do not take account of fragile lands, catchment areas, wildlife habitats and rare plants. This has led to loss of forest cover and the valuable plant species therein, as well as loss of valuable habitat for animal life.

Transboundary smuggling of produce
Smuggling of valuable hardwoods across Kenya/Tanzania border has been cited. The commonly smuggled hardwoods include Ebony, mangroves and *Brachylaena*.

Poor governance
Most gazetted forestland, which has been converted to settled agriculture in Kenya, has hitherto been through legal excisions. Rodgers and Burgess (2000) have attributed the root cause of this threat to governance. According to this analysis, excisions, inadequate forest boundary demarcation and clearing, inadequate policing, corruption, inadequate participation by local communities in management, inadequate appreciation by local people of the value of conservation, etc, are a result of poor governance. While

serious in the very recent past, the threat from excisions has somewhat diminished with the election of a new government, which has committed itself to preserving and even increasing the area under forests in its public pronouncements and manifesto.

Mining (salt mining and titanium)
Exploitation of limestones, silica sands, iron ore, manganese and the proposed mining of titanium at the coast are a major threat to Kenya's coastal forests.

Fire
Fire is a threat to all coastal forests and mangroves to some extent especially during the dry seasons. The coastal traditional fire-use system in land clearing is destructive to biodiversity and a cause of uncontrolled wild fires that indiscriminately destroys forest and bushland ecosystems.

The problem is that their frequency maintains certain types of vegetation, to the detriment of narrow endemic Coastal Forest specialist species. Apart from arson, forest fires are caused by honey hunters, grazers, smokers and from adjoining farmers clearing land for crop production.

Overgrazing
Overgrazing in coastal forests is not a serious phenomenon, and mainly occurs during exceptionally dry years. With increasing livestock farming in the region, overgrazing could in future become a serious threat to the forests.

Unsustainable exploitation of preferred species
Some tree species have been excessively exploited for tourist-destined carvings and other utility wood products e.g., "Muhugu" (*Brachylaena huillensis*), mbambakofi (*Afzelia quanzensis*) and African black wood (*Dalbergia melaxylon*). Mvule (*Milicia excelsa)* has been heavily exploited for timber. Similarly, plants of known medicinal value are either uprooted or debarked without regard to sustenance. This has not only interfered with their natural regeneration but also the forest structure, species composition, habitat quality and potential.

Forest fragmentation
Fragmentation of the forests, threatens many of the single-site endemic species with extinction. This ecoregion is considered as the hotspot most likely to suffer the most plant and vertebrate extinction for a given loss of habitat.

Threats to Kayas
The sacred Kaya forests are under the following threats;
a) Dumping of wastes from hotels in South Coast.
b) Conversion to agriculture
c) Illegal logging
d) Road construction e.g. a road was constructed across Kaya Bombo
e) Seasonal fires caused by farmers adjacent to the Kayas.
f) Construction of tourist hotels and beach cottages e.g. Kaya chala
g) Excessive tourists visit as the case of Shimoni Cave grove because of bat roosts.
h) Charcoal burning
i) Limestone quarrying e.g. Kaya Kambe and pangani rocks sacred Grove in Kilifi where marble quarrying threatens its existence.
j) Manual Iron ore quarrying e.g., mining at Kaya Kauma for sale to Bamburi Cement Factory Co Ltd in Kilifi district.

Threats to mangroves

Mangrove forests are threatened by conversion to agriculture, Mari culture ponds, salt evaporation ponds and traditional uses exceeding the sustainable levels of the direct products. The current status of the mangrove ecosystem shows that the resource is heavily over harvested and there is a potential pollution from increased port activities.

Mangroves poles from Mida Creek, Mto Kilifi and Ngomeni in Malindi district, and Lamu have been exported to Arabian countries namely Iran, Saudi Arabia, Dubai, Iraq, Kuwait, Bahrain and Somalia in Africa, since as early as the 9th century to 1982 when the government banned export as result of over exploitation. The exports were mainly of *Rhizophora mucronata* (mkoko). However, despite this ban, mangroves are still being exported.

Mangrove conversion for pond culture and for saltpans is highest at Ngomeni in Malindi District. Saltpans are constructed on the northern side of Malindi partly into the mangrove zone at the landward side. Mangrove trees are also cut for the purpose of pond construction.

Over exploitation of mangroves has led to decreased fish and prawn catches as well as limited tourist attraction.

Other causes of mangrove ecosystem degradation are;

a) Damping of solid waste and non-biodegradable materials, sewage and industrial toxic wastes.
b) Oil spillage from the port area. In 1998, accidental oil spills from punctured tank killed two hectares of healthy mangroves near Kibarani.
c) Clearing of mangrove trees to create access routes to shorelines and pave way for physical developments. This causes hydrodynamic changes in sea currents and encourages erosion of the shoreline.

Table 2 shows analysis of root causes in workshops organized by GEF 2002, WWF 2003 and CEPF 2003). Table 3 shows the specific threats to conservation of the major Kenyan coastal forests.

Table 2. Analysis of root causes of forest degradation

Root cause	**Manifestation**	**Root causes**	**Manifestation**
Population growth	Increased demand for resources	Lack of for a for communal exchange and networking	No transfer of lessons; no sharing of common problems; opportunities for engaging in conservation not communicated
Poverty	Over exploitation; lack of opportunity to think beyond immediate needs; vulnerability to corruption; involvement in illegal activities	Lack of experience and incentives to develop alternative livilihoods	Little opportunity to change environmentally damaging lifestyles
In efficient land use practices	Low agricultural yields; declining soil fertility; increased demand for land; encroachment and clearing of forests	Lack of local mechanisms for controlling forest exploitation	Absence or breakdown of traditional conservation practices; local communities over exploit forest resources; exploitation of forest resources by outsiders is unchecked;

			unprotected forests are lost.
Negative value systems for conservation and lack of environmental awareness	Absence of local constituencies for conservation; ignorance of consequencies of damage to environment; low motivation to conserve biodiversity.	Limited ecosystem wide strategic focus	Piecemeal conservation efforts; short-term projects; lack of continuity in conservation activities; lack of coordination among different projects; landscape issues not tackled.
		Weak forest governance	Inadequate stakeholder involvement

Table 3: Major Threats to Specific Kenyan Coastal Forests

Forest	Threats
Shimba Hills	- Encroachment - Fires - Cutting for poles, fuelwood, timber and carving materials - Intentional grass fires - Inadequate management
Medium Kwale	- Encroachment - Cutting for poles, fuelwood, timber and carving materials - Intentional grass fires - Mining for Niobium (Mrima) and Titanium - Inadequate management
Kilibasi	- Inadequate management
Madunguni	- Encroachment/human settlement - Soil erosion - Charcoal burning - Cutting for poles, fuelwood, timber and carving materials - Intentional grass fires - Unsustainable logging especially for poles and carving materials - Excisions - Hunting - Inadequate management
Arabuko Sokoke	- Cutting for poles, fuelwood, timber and carving materials - Unsustainable logging especially for poles and carving materials - Excisions - Hunting and illegal extraction of forest produce - Inadequate management
Kayas	- Encroachment on some sites - Tourism/urbanization (Kaya Chale) - Intentional grass fires - Grazing - Hunting - Inadequate management

Marafa Brachystegia	- Inadequate management - Cutting for poles, fuelwood, timber and carving materials - Intentional grass fires
Tana River Delta	- Encroachment - Cutting for poles, fuelwood, timber and carving materials - Grazing - Inadequate management
Witu Lamu	- Cutting for poles, fuelwood, timber and carving materials - Encroachment - Intentional fires - Poor management - Inadequate management
Boni/Dodori	- Cutting for poles, fuelwood, timber and carving materials - Grazing - Fires - Inadequate management
Tana Gallery forest	- Encroachment - Grazing - Fires - Inadequate management
Ras Tenewi	- Inadequate management - Fires
Mangea Hill	- Encroachment - Inadequate management

5.0 MAIN ISSUES/CONSTRAINTS TO CONSERVATION AND SUSTAINABLE MANAGEMENT OF NATIONAL COASTAL FORESTS FROM A SOCIO-ECONOMIC PERSPECTIVE

Policy failures

The policies and legislation that impact on forests include those that address land tenure and land use issues, and specific sectoral policies, including those that directly address forestry.

a) Limited Security of Tenure

Most land in the coast province is trust land meaning that a large percentage of rural populations do not have a secure title. Only 40,400 out of the 262,000 households at the coast have titles to their land and therefore secure tenure. This severely discourages the remaining community of more than 220,000 people from planting trees on land with insecure tenure. The result is the opportunistic exploitation of forest resources.

Charcoal burning is prevalent in woodlands where the local communities do not have secure individual or communal land tenure.

The Tana River Primate National Reserve

Land in Tana River District is Trust Land. In mid-1990s, the KWS proposed the resettlement of people living within the Tana River Primate National Reserve. Compensation was to be made to the local communities based on their land holdings. News of this resettlement and compensation plan resulted in an acceleration of forest destruction as members of local communities tried to increase their land holdings, which would in turn increase their amount of compensation.

b) Tree Tenure

The recognition of tree tenure is relevant to forest conservation. Tree tenure refers to property rights and claims associated with trees and may include the rights to cut, plant and harvest products from trees. Issues of tree tenure have arisen especially with regard to local communities that have planted trees on government land. Lack of tree tenure can inhibit the willingness of local communities to engage in tree planting and forest conservation.

c) Double gazettement of forests

Shimba Hills Forest is gazetted both as a forest reserve and as a national reserve. This creates conflict because in law, an offender can only be charged using one law. This leaves room for manoeuvres. Double gazettement also creates potential conflicts in development because of different mission mandates under different agencies. For, example, plantation development in Shimba hills failed because it is not a development mission under the Wildlife Act.

d) Economic/Development policies

Certain policies tend to focus on their attention on economic development and will allow clearance of natural habitats to attain their goals without consideration of environmental issues. This has resulted to clearance of prime forests for establishment of tourism facilities, roads and agricultural projects.

e) Forest Policy and Act

Kenya's first forest policy was formulated in 1957 and revised with a few modifications in 1968. This policy concentrated on catchment protection and timber production, with strong government control (MENR, 1994). The current Forest Policy of 1994 replaced the one of 1968. The policy is in support of the Forest Act, Cap. 385 (revised 1982 and 1992). Despite changes in the realities of the Kenyan society and the development of new approaches to natural resource management, the country continued to be guided by a policy that was formulated soon after independence.

The Act is silent on the management and conservation of tree resources in the vast Arid and Semi Arid Land (ASAL) areas where a lot of charcoal production takes place. Most of the ASAL fall under trustland where permits from local administration is a requirement prior to any charcoal burning. Most of the charcoal burners in these areas do not look for permits.

One of the most contentious section of the Forest Act is Section 4 which permits the Minister to gazette and de-gazette Forest Reserves. This section is in most cases abused by Ministers who make unilateral decisions without any consultations or environmental assessments.

Section 4 allows for public objections within 28 days to alterations of forest boundaries. However, the Act does not set out the procedures for objections. In the past, objections from members of the public were not acknowledged and the excisions continued despite the objections.

The Kenya Gazette is the main mode of announcement for alterations or additions to Forest Reserves. Many Kenyans do not access the Kenya Gazette and may not therefore be in a position to put objections. The Act also requires that a person establishes a "*Locus Standii*", that is, the ad hoc constitution of a body comprised of entities that have "substantial interests in the status and fate of a forest. In most cases this is difficult to establish especially for people living far off from a particular forest.

f) The Land Policy

Kenya continues to lack a land use policy despite official statements on the need for such a policy. In National Development Plans (1989-1993 and 1997-2000) the government acknowledges that there has been inadequate provisions for environmental conservation and proper land use planning. The Plans proposed the formation of a Land Use Commission to address land tenure and land use policy issues, with a view to improving sustainable agriculture as well as ensuring that biodiversity consideration are incorporated into land use decisions.

g) Forests on Trust land

Forests on Trust Land are vested in the relevant Local Authorities. However, often these local authorities lack the expertise and commitment to forest management. Councils are run by elected Councilors and Mayors with the Ministry of Local Government providing technical personnel to the Councils. In the past, technical personnel provided to Councils have not included foresters or natural resource management professionals. Therefore, some of these forests are being destroyed in pursuit of short-term goals with immediate and tangible benefits. These forests are also sometimes allocated for other uses with limited consultation with the affected local communities.

h) Inadequate community participation

Current policies do not address the issue of community participation in forest management adequately. The only notable areas where the Forest Act provides for community involvement is collection of forest products in particular fuelwood, honey and medicinal. The government policy also enables local community to assist the Forest Department in tending of tree seedlings through the Non Residential Cultivation.

Local communities have therefore viewed forests as government land, hence have for a long time been over exploiting the forests for short-term gains. Adequate and genuine involvement of local communities is called for especially now when the Forest Department does not have enough resources to enforce laws on its own.

i) Cross Border issues

Lack of harmonised policies and laws in the Eastern African region has played a major role in forest degradation in the region. Corruption has allowed illegal trading of forest products at borders and exportation of mangrove poles despite the ban.

j) Other policy issues

Most laws that affect the forestry sector fail to address livelihood pressure, access rights to communities and alternatives to resources. Today, there is no adequate policy that addresses charcoal comprehensively. While it is perfectly legal to sell charcoal, to buy it and cook with it, in most of the country it is illegal to produce and transport charcoal.

There are other policies relevant to forest management that include the National Environment Action Plan (NEAP) of 1994, the National Biodiversity Strategy and Action Plan NBSAP) of 1998, the Sessional Paper on Environment and Development of 1999 and the Kenya Forestry Master Plan (KFMP) of 1994. Though having good intentions, most of these have not been implemented due to limited capacity.

Specific policies and statutes on water, wildlife and agriculture also have provisions for forest management. Some of these are contradictory e.g, policies of agriculture and forestry.

There are also numerous Presidential Decrees and Directives that are poorly implemented. These include a decree banning the felling of indigenous tress that was made in 1980s.

Lack of alternatives to forest products and economic activities
At the local level there is lack of alternatives for building materials or sources of household energy to substitute for wood and charcoal.

Poverty and general lack of economic activities is closely connected to over use of natural resources and therefore posing a major challenge for planning and implementing a sound forest conservation programme.

Inadequate institutional and financial capacity

a) At Government Department level
Following retrenchments of forest staff at Forest Department in the last few years and inadequate resources (both capital and financial), the department has been unable to enforce forest rules and regulations. While the Kenya Forest Master Plan recommends 32 people per forest station, it is not uncommon to find a station with less than 10 people. In fact some mangrove forest areas like Ngomeni, Sabaki and Mto Kilifi do not have staff permanently stationed there to ensure forest conservation.

The capacity and governance of the lead institutions in management must be addressed to deliver benefits to the government and people of Kenya. Leadership, governance, participatory policies and legislative frameworks are critical capacity needs for Forest Department to address forest conservation.

The MoU between the Forest Department and KWS is not well facilitated. Enhancing capacity of the two institutions and strengthening of the MoU will contribute to reduction in forest degradation.

b) At local community level
Due to the fact that local communities are the ones mostly impacted upon by the way forests are managed on one hand, and on the other, they are the ones mostly impacting on these resources through unsustainable utilization, their participatory involvement in management is the most effective way of management. At this level, there is inadequate empowerment for effective participation.

Other existing challenges include inadequate capacities at the national and local level for sector wide working, insufficient knowledge base to make informed decisions and the need for stronger partnerships with civil society and the private sector in order to conserve coastal forests.

Law Enforcement
The Forest Department has developed regulations of harvesting mangrove poles but the regulations have not been enforced. Since Forest Department is thinly represented on the ground, local consumption for say firewood, domestic furniture making, house building and crab consumption goes unnoticed. The guidelines are also not understood by the pole cutters and therefore are not followed. Illegal practices do occur especially in remote areas where the foresters find it difficult to access.

Law enforcement is worse in forests under trust land as the situation is close to free for all. As a result, some of the forests have been encroached like the case of Madunguni and Mangea Hill forests. Trustland forests have also been over exploited for charcoal.

There is need to enhance cooperation between relevant law enforcement agencies like Forest Department, KWS, Kenya Police, Local courts, Department of customs and excise and international agencies in order to reduce fraud and enhance law compliance.

There is need to increase awareness on the consequences of weak law enforcement in forest conservation. The police and magistrates need to be sensitized on the relevant laws that can be used to deter forest offenders. Magistrates need to start giving heavy penalties to forest offenders to deter them. The current penalties awarded are not stiff enough to deter the offenders.

Forest guards currently are not well trained to prosecute forest offenders. In a number of occasions, the forest guards arrest people but because of limited knowledge of forest rules and regulations, the offenders are charged with low penalty offences leading to their release, which ends up discouraging the forest guards.

Licensing of Forest Produce Extraction

Two main types of licenses are issued for forest reserves: for commercial and subsistence use. The later (known as tickets) are issued at Forest Stations and are valid for one month. They are issued for firewood and other produce; nominal charge is made.

A central Forest Department licensing committee approves general forest licences for commercial purposes with final approval by the Minister for Environment, Natural Resources and Wildlife. These licenses have not been issued in the last two years due to the moratorium imposed on harvesting in government forests. The majority are issued for extraction of plantation produce; those relevant to coastal indigenous forest are for fuel wood, pole wood, quarrying, beekeeping and medicinal plants.

Technical data in indigenous forest is inadequate leading to issuing of permits based on demand and general impression of local officers as to the capacity of forests to sustain the off take. There is need to carry out an inventory of all coastal forests to be used to determine off take levels.

Attitude to Forest Conservation: conflicting viewpoints

Perception of the "worth" of a forest by different sectors of the community has led to conflicts over potential land use options. Three main view points can be identified (Rodgers, 1993).

a) The local community at the coast view forest as a family source of land, food and fuel wood.

b) Local and central governments look at forests as a source of employment and revenue through exploitation of timber and other forest products including rents.

c) International and local conservation organizations view forests as important gene pools for biodiversity areas) and environmental buffer zones of value to the country. The forests are also water catchment and source of timber.

For the coastal forests, where there are no water catchment values of national importance, and few remaining timber resources through which the Forest Department or local government could create local employment, there is a strong potential conflict between the conservationists who wish to protect the forests for their biodiversity values, and the local people who wish to use the forests to survive.

6.0 RESPONSES

Since colonial era, the gazetted forest areas in Kenya has been owned and managed by the government. The public forestry management and development emphasized working rules about the nature and extent of forestry use and conservation. The local communities and other collaborative management were absent in such management regimes. Fortunately, over the last five years, the government of Kenya has put in place a number of policy instruments to deal with the problems of the forestry sector, mainly degradation of forest ecosystems and the acute disregard for social forest-based needs. Some of key instruments and actions taken include:

Forest policy and Forest Bill 2004
The government is in the process of debating a new Forest Bill and Forest Policy – both of which will give clear and direct support for involving a wider collection of stakeholders in the forest sector than has been the case in the recent past. While the Forest Department (and in its transformed state – the Forest Service) remains responsible for strategic, policy and technical advice in forestry matters, its staff actively welcome the participation from other government agencies, civil society, the private sector and community-level registered groups in the sector.

Guidelines on Participatory Forest Management
The Forest Department is in the process of preparing Guidelines to facilitate positive interaction between interested stakeholders within the forest sector in order to develop forest management plans and implement sustainable forestry activities through a process of negotiation and collaboration. These Guidelines are to be used by GoK Forest Staff as well as staff from other stakeholder organizations *as a guide for undertaking practical participatory and collaborative work in the sector*.

The Water Act 2002
The strength of this Act is in its endeavor to promote Participatory forest ecosystem resource management, on which water catchments are. This is seen through the devolution of roles and responsibilities to the stakeholders, who not only participate in the development of catchments management plans, but are also responsible for conflict resolutions, cooperative management and providing catchments and water resource use and management advice to regional office of the Water Resource Management Authority. This allows social, economic and ecological aspects of the catchments to be incorporated in the management plans. This Act is applicable in river basin management and it can be applied in the management of Tana River delta, riverine forests and adjacent catchments.

National Energy Policy
The policy address environmental problems associated with the supply and use of energy including charcoal and fuel wood which are major causes of habitat loss along the coastal forests.

The Land Law
The government through the Commission on Land inquiries released a report of the findings of the review of the land system in Kenya in 2003. The report will form the basis of a Land Law in the country which when enacted will address most of the land issues that have contributed to forest degradation.

National strategy for achieving poverty reduction
Kenya is committed to reduce poverty levels as reflected in the Interim Poverty Reduction Strategy Paper (I-PRSP 2001) and the 9th National Development Plan. The Economic Recovery Strategy for Wealth and Employment Creation (2003-2008) brings together priorities from both these plans to help determine development priorities and subsequent resource allocation for purposes of reducing poverty. Some of the

mechanisms already in place to hasten the process include the Medium Term Expenditure Framework (MTEF) and the Local Authority Transfer Fund (LATF).

National strategies for achieving environment and sustainable development objectives
In recognition of the close link between environment and development, Kenya has in place a series of instruments and mechanisms to facilitate mainstreaming of environment into development. The National Environmental Action Plan (NEAP) developed in 1994 provided the basis for the development of sessional paper No. 6, but which was never taken to Parliament for debate. Kenya has a number of sector-based Acts with strong environmental mandates. The overlaps and conflicts between them provided the drive for development of the Environment Management and Coordination Act (EMCA). In 1999, EMCA was passed followed by launching of the National Environment Management Authority (NEMA) in July 2002 to implement EMCA. EMCA takes precedence over sector based legislations where conflicts/overlaps arise.

NEMA has developed EIA procedures and guidelines for mainstreaming of environmental concerns in development. One of the core businesses of the Authority is to promote integration of environmental considerations into development policies, plans, programmes and projects.

International Treaties, Conventions and agreements

Kenya is a signatory to a number of international treaties, conventions and agreements that serve to inform its national strategies for purposes of achieving environmentally sustainable development. These include the Ramsar Convention, Convention on International Trade in Endangered Species (CITES), Convention on Biological Diversity, United Nations Convention to Combat Desertification, the United Nations Convention on Climate Change, the Nairobi Convention (Marine and Coastal Environment of East Africa) amongst others as well as agreements from the World Summit for Sustainable Development (WSSD).

Gazettement of Kayas as National Monuments
A preliminary Floristic survey of Kaya Forests of Coastal Kenya funded by WWF found out and listed Kayas including their vegetation. One of the objectives was to discuss the conservation possibilities with elders and district administration. The study established that gazetting the Kayas as National Monuments was the most acceptable way of protecting the Kayas at the national level. Today, most of the most important Kayas are gazetted, others are in the pipeline.

The changes in the government
Following the general elections of the December 2002, a new government was voted in. The first priority of the government is to root out corruption through zero tolerance of corruption. Since January, forest officers suspected and some implicated in corruption and illegal destruction of forests have been suspended.

Donor support
The improvement in governance by the new government has created donor confidence and support is now being availed to the forestry sector.

Annex 1: Priority Kenyan Coastal Forests, their area and legal status

Forest	Area (sq. km)	Status	Vegetation Type
Arabuko Sokoke	370	FR	Forest
Madunguni	53	FR (2003)	Forest
Shimba Hills	214	NR	Forest/ Grassland
Kaya - 47 Sites	28.4	NMK/FR	Forest/ Woodland
Medium Kwale	51	FR	Forest
Marafa Brachystegia	30	TL	Forest/ Woodland
Tana River Delta	10	TR	Forest/ Woodland
Witu Lamu	15	FR	Forest
Boni/Lungi	95	FR	Woodland
Tana Gallery Forest	11	TL	Forest/ Woodland
Dodori/Boni	220	FR/NR	Woodland
Ras Tenawi	20	TL	Thicket/ Forest/ Woodland
Kilibasi	2	CC	Forest
Mwangea	15	TL	Forest
Mwangea Hill	5	TL/Private	Forest

FR – Forest Reserve, TL – Trust Lands, NR – National Reserves and CC – County Council

(Source: Kenya National CF Task Force proceedings)

The area of the forests ranges from three-hectare patches to large tracts such as Arabuko Sokoke covering 37,000 ha. Other large forests such as Marafa Brachystegia and Boni/Dodori have neither been demarcated nor surveyed, hence the figures cited above are approximations.

Annex 2:
Institutional problem analysis

Name	Capacity issues/needs
1. Government agencies	
Ministry of Environment, Natural Resources and Wildlife	Awareness raising and sensitization to: • expand protected areas network; • speedy enactment of forest bill and passing of forest policy; • support development of appropriate forest management policies, guidelines and procedures; • enhance law enforcement; • speedy setting up of new FD or forest service; • fully operationalise NEMA; • develop community forest management processes and mechanisms; • secure all gazetted forests; • provoke 2001 excisions;
Forest Department	• Institutional set up and strengthening • Skills development for sustainable management of forests • Participatory forest management capacity • Community forests management capacity and approaches • Capacity for law enforcement • Capacity for tracking certification of wood products • Capacity to undertake conservation practices • Capacity to survey and secure titles for all remaining forests • Strengthen district foresters capacity to carry out their mandate
Kenya Wildlife Service	• Institution strengthening to open up new stations • Skills development for sustainable management of forests • Skills development for participatory forest management • Community forests management • Capacity for law enforcement • Capacity for sustainable low cost monitoring • Pass new wildlife act recognizing local communities
Kenya Forestry Research Institute	• Set up and empower new research base at South Coast • Support training of trainers (ToT) on PFM • Enhance capacity to collect, propagate and distribute seeds for restoring indigenous forests • Support sharing and dissemination of research findings
National Museums of Kenya	• Strengthen CFCU • Support research on key biodiversity issues • Capacity to effectively monitor, analyse, report and disseminate biodiversity information • Strengthen collaborative links with KEFRI to harmonise socio-science data

	• Establish and strengthen a nature business research unit • Develop capacity to manage national monuments • Enhance nature-based businesses learning from Kipepeo
National Environment Management Authority (NEMA)	• Capacity to implement EMCA • Strengthen provincial and district committees to coordinate, monitor, and feedback
2. Lobby and Conservation Agencies	
Nature Kenya	• Support institutionalisation of ongoing national biodiversity monitoring framework • Strengthen capacity to establish local constituencies for site conservation • Strengthen capacity of Environmental Legislation and Policy Working Group to analyse and disseminate information including via KFWG • Capacity to initiate nature-based busineses
Kenya Forest Working Group	• Strengthen capacity to receive and disseminate information to members and government
Forest Action Network	• Capacity to carry out policy and legislatioin awareness raising and sensitization among local communities
African Wildlife Foundation	• Engage and strengthen capacity to initiate nature-based businesses
Private Agencies Collaborating Together (PACT)	• Support to promote CBOs institutional capacity and development
International Centre for Insect Physiology and Ecology	• Support to research and initiate nature-based enterprises building on successes in Kakamega • Capacity to control Tse Tse promoting local livelihoods through improved livestock rearing • Capacity to market nature-based products e.g honey
Forest Adjacent Dwellers Association (FADA)	• Institution strengthening • Awareness raising and sensitization • Skills development for sustainable management of coastal forests • Participatory forest management • Community forests management • Law enforcement • Forest Monitoring • Business development and management • Forest restoration
Coastal Forests Conservation Unit	• Enhance capacity to work with Kaya elders • Establish CFCU as a fully fledged government financed department as CF care taker
3. Legal centres	
Centre for Research and Education in Environmental Law(CREEL)	• Strengthen capacity to lobby government and educate the public on forest policy and legislation provisions • Capacity to mainstream forest policy and legislation

	issues and regulations into primary school curricula