The Coastal Forests of Kenya

Forests data, threats, socio-economic issues, values, stakeholders, challenges, strategies, investment and enabling environment

A national synthesis report for the development of the WWF-EARPO Eastern Africa Coastal Forests Ecoregion Programme

By

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1. Introduction

Coastal forests are the forests of the coastal strip of east Africa (TFAP, 1989) and they are composed of mangrove forests of the salt-water coasts, the forests of the mountain systems and the lowland forest patches. The coastal forests of Kenya cover four districts: Lamu to the North, Malindi and Kilifi in the middle and Kwale in the south including Mombasa City. The northern limits of the forests 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, one of leading foreign exchange earner; they are important water catchment areas for the rivers and streams on which the local people in the coastal areas depend; and they are centers of endemism for a wide variety of globally threatened fauna and flora. The Coastal forests 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. Important mainstream livelihood activities along the Kenyan coast exist: fishing within mangrove areas and creeks, carving, agriculture, tourism, mariculture, harvesting of medicinal plants, salt production, harvesting of mangroves and wildlife harvesting. The more common goods extracted from coastal forests include fuel-wood, poles, timber, logs for carving, water, pasture for livestock, herbal medicine, butterflies, snakes and honey. Threats on coastal forests are many: excision, unsustainable cutting of forest produce, overgrazing and charcoal burning. These threats are caused by many factors mainly: increased human population and activities; poverty, unregulated use, insufficient local and national institutional capacities, policy gaps and weaknesses and lack of alternative means of livelihood among others. Key coastal forest products that are traded include: butterflies, snakes, honey, timber, pole-wood, falconry and unauthorized game meat. However, much of the trade is not supported by national policy and legislation. In general, habitat areas are declining and the area of agricultural land and land which is used for villages, tourism facilities, towns and cities expanding. 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, biodiversity conservation and national and global benefits and goods and services. 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.

International interest in the Coastal Forests hotspot has increased over the last three decades as the realization of its biodiversity importance and of the global crisis affecting tropical forests has deepened. Conservation work in the coastal forests of Kenya started way back in 1983 when a team from the International Council for Bird Preservation (ICBP, now BirdLife International) surveyed the avifauna of Arabuko-Sokoke Forest on the north coast of Kenya and drew attention to its globally threatened bird species (Kelsey & Langton, 1984). A detailed survey (Roberston, 1987) of the sacred *Kaya* Forests (conserved by the Mijikenda, a group of nine tribes on the Kenyan coast) highlighted their conservation importance for trees and led to a comprehensive survey of Kenyan coastal forests commissioned by WWF (Robertson & Luke 1993). This focused on the plant species and on the status of the forests and made recommendations for their conservation. More recently, WWF-EARPO organised a series of workshops to develop an Eastern Africa Coastal Forest Programme covering Kenya, Tanzania and Mozambique (WWF-EARPO, 2002). Thirty-one scientists and stakeholders from these three countries attended a regional workshop in Nairobi in February 2002. It aimed at developing a regional synthesis on coastal forest resource issues and a vision, strategy and way forward for realizing the coastal forest programme. There was a strong focus on country-based group work. Maps of the region were updated, threats and root causes were analyzed, country conservation targets were agreed on and preliminary logframe action plans were developed for each country (CEPF, 2003; WWF-EACFC, 2002). The document resulting from the February 2002 workshop includes comprehensive annexes which list the coastal forest sites (showing their locations, areas, status, altitudes and threats) and the endemic animals, as well as the threat analysis and country action plans. On 12 March 2003, a CEPF workshop was held in Dar es Salaam to define the investment niche for CEPF, building on all the previous effort. Participants included 48 people from scientific and research institutions, government departments, NGOs, field projects and donor organizations, all of whom worked in or had knowledge of the hotspot. The outputs from the workshop were subsequently incorporated into a wide-ranging consultation process that helped to define the investment priorities for CEPF in this hotspot providing a wealth of more information and reference widely used in the production of this synthesis report. These initiatives have produced a wealth of recent information on biodiversity issues (in particular on the distribution of endemic species across sites) and on forest status and management and threats. This information has greatly reduced the time and effort needed to prepare this synthesis report.

The WWF-EARPO workshop of 2002 set taskforces to help refine the workshop report and transform it into a programme document for the eastern Africa coastal forests. The national task force for Kenya reviewed the report and identified some gaps in policy and legislation, socio-economic coverage, resource assessment and trade issues. The taskforce recommended that a team of national experts be engaged to quickly compile information and fill the gaps. The Kenya Forests Working Group (Michael Gachanja) and Forest Department (Ben Wandago and Enock Kanyanya) compiled information on socio-economic issues and enabling environment respectively while Kenya Forestry Research Institute (Mr Mbuvi) compiled data on trade issues as Ann Robertson (formerly of National Museums) and Athony

Githitho (Kipepeo) compiled information on forest data. Nature Kenya (Paul Matiku) coordinated the national studies which were used to produce this synthesis.

The synthesis therefore summarizes information on Kenya's coastal forests data, threats, environmental issues, current stakeholders and capacity needs, current investment and levels, and the enabling environment. The report highlights some niches that future conservation programmes could try to target. This report is a WWF document aimed at helping in the production of a programme for the Coastal Forests in east Africa and may be used as a framework for developing project proposals to address underlying threats.

2.0 Description of Coastal Forests

2.1 Data on coastal Forests

Kenya's closed canopy forests are estimated to cover 2% of Kenya's land (Wass 1995): indigenous forests =1.24 million ha; plantation forests= 0.16 million ha; totaling 1.4 million ha (Wass 1995). Today, plantation forests are estimated to be 120,000 ha down from 160,000 ha (Waithaka *et al* 2003). Several types of coastal forests occur in Kenya: Woodland (0.1%); Coastal evergreen bushland (0.4%); Coastal palm stands (<0.1%) (Bennun & Njoroge, 1999). By the early 1990s, there were about 107 forest patches in the Coastal Forest Mosaic in Kenya covering an area of 660 km2 (Burgess et al. 2000). Mean patch size in Kenya was 6.7 km2 with modal patch-size classes ranging 0 – 1 km2. The two largest coastal forests are Arabuko-Sokoke, (minimum area 370 km2; Shimba Hills, (minimum area 63 km2) (WWF-EARPO 2002). There is some uncertainty with these numbers since available information is somewhat out of date and the current situation is, again, far more likely to have deteriorated than improved (Burgess et al 2000). No reliable estimates are available for the coastal forest with intact and contiguous canopies or for the extent of forest loss in recent history. The need to update coastal forests data is critical.

1.1 Coastal forests protection status and management

Kenya has a total of 107 coastal forests, 49 of which are home to over 90 threatened species of plants and animals. Most coastal forests (80.3%) in Kenya have been awarded some form of protection: 1 National Park (6km2); 2 national Reserves (74 km2); 21 national Monuments (6 km2); 14 Forest Reserves (469 km2); 23 sacred sites (13 km2). 35 forests (95 km2) have no legal protection and fall within private land. National Parks (Shimba Hills) and a small part of Arabuko-Sokoke forest and National Reserves (including Tana River Forests) are officially managed by the Kenya Wildlife Service. National monuments are managed by the National Museums of Kenya not principally for their biodiversity but for their historical importance. Forest Reserves, including Nature Reserves (e.g Arabuko-Sokoke Forest) are managed by the Forest Department but the level of protection is weak given very insufficient capacity to patrol and ensure protection. Sacred forests are managed by the local elders which if promoted and supported can be very strong. There are almost 50 Kaya forest patches scattered throughout the ecosystem, most of which are now protected under the Antiquities and Monuments Act. Forests within private land are at the mercy of individual land owners or government estate managers and officially they are classed as unprotected and highly vulnerable. The largest National Park Area in Kenya is some 6.2km2 inside the 416km2 of Arabuko-Sokoke Forest Reserve. Additionally, 63km2 of National park can be found inside Shimba Hills National Reserve, 11km2 in Tana River National Reserve and some unknown areas in Boni and Dodori National Reserves. A significant proportion of coastal forests in Kenya (114km2) have no formal protection e.g. Ras Tenewi, Tana Delta, North Kilifi Brachystegia Woodland, Mangea Hill and Kilibasi Hill. In terms of biodiversity, coastal forests in Kenya that together host all globally threatened species occurring within the coastal strip and therefore the most important blocks are: Shimba Hills, Lower Tana River forests, Witu Forest Reserve, Arabuko-Sokoke Forest; Diani Forest and Kaya Ribe. Virtually all coastal forests in Kenya have globally unique biodiversity values and most contain at least one endemic species (Burgess & Clarke 2000) and all deserve some form of recognition and protection.

Table 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**

(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.

1.2 Physiography/form/canopy structure, dominant species, etc. of main blocks/forests

The eastern limit of coastal forests of east Africa include the offshore islands of Pemba, Zanzibar and mafia and all islands up to 100 km east of the continental African coast between 2^0-25^0S but may also include Inhaca Island at 26^0S. Mangrove forests are not included as eastern African Coastal Forests, since they are treated as an azonal vegetation unit outside of the Zanzibar-Inhambane region (White, 1983a, p.260) but they form an excellent transitional link and intervention zone between the Coastal Marine and Costal Forests eco-regions as defined by WWF-EARPO. The northern limit include Somalia between Bad Daada and Raas Kaambaoni as described in Friis and Vollesen (1989) and mapped in Friis and Tadesse (1991). The forests belt occurs further south at the Kenyan-Somalia border, where the Mundane Range of hills meets the sea. An outlying island of the coastal forests occurs further to the northwest along river Tana (Medley, 1992).Altitudinal ranges from sea level to a maximum altitude which varies according to local ecological conditions, but is no where more than 1100 m in Tanzania.

The coastal forests of Kenya form part of the Archipelago-like regional sub-centre of endemism in the Swahili regional centre of endemism and the Swahili/Maputaland regional transition zone along the eastern coast of Africa. The main vegetation formation types are defined in Forest sensu by White (1983) who defines a forest as ‘a continuous stand of trees with canopy varying in height from 10 m to 50 m or more, characterized by; several layers or storeys; tree overlaps interlaced with lianas; a shrub layer densest in forests with more open canopy. A true forest has sparse ground layer and may be absent or consist only of bryophytes. ' The floristic composition indicate that coastal forests are dominated by tree species whose global distribution is limited to the eastern African coastal area (Swahili near endemic tree species) with more than 50 % of all individuals known to have a diameter at breast height of 10 cm or more.

The term 'Eastern African Coastal Forest' is here defined as a collective term to encompass the typical vegetation formation type (eastern African Coastal Dry Forest) as well as variant and transitional formation types/sub-types. The typical formation type is the E*astern African Coastal Dry Forest consisting of s*emi-evergreen or evergreen undifferentiated dry forest *sensu* White (1983), with the amendments that (1) eastern African Coastal Dry Forests can occur where atmospheric humidity is high throughout the dry season, and (2) these eastern African Coastal Dry Forests may have a lower canopy (to 7 m) than the minimum limit of 10 m adopted in White (1983). Representative samples include the '*Cynometra webberi-Manilkara sulcata’* community of the Arabuko-Sokoke forest.

Variant formation types include the *Eastern African Coastal Scrub (*White, 1983) which is intermediate in structure between forest (canopy height > 10 m) and bushland or thicket (canopy height < 10 m). In eastern Africa scrub forest may have a lower canopy (to 4 m) than the lower 7 m limit imposed by White (1983), but retains other forest features such as overlapping tree crowns, abundant lianes, a leaf-litter layer and emergent trees which often exceed 10 m in height. Herbs are scarce to absent. Representative examples include scrub forest near Msambweni. Variant vegetation formation subtypes include the *Eastern African Coastal Brachystegia Forest (*White, 1983) dominated by *Brachystegia spiciformis* as seen in Arabuko-Sokoke forest. This formation type occurs on degraded/poor white soils with canopy crowns that rarely touch and never interlock and lianes and grasses are usually scarce or absent making it impenetrable by fire.

A Transitional Vegetation Formation sub-type include the Eastern African Coastal Riverine/Groundwater/Swamp Forests *(*White, 1983) in areas where the water table is high or where drainage is poor e.g along the Tana River where dominant canopy trees are predominantly of species with wide tropical African distributions but understorey trees and shrubs are dominated by species restricted to the Coastal Forest belt. Another is the *Eastern African Coastal/Afromontane Transition Forest* ('Transitional' Vegetation Formation type (White, 1983) in lowland areas at the base of the Eastern Arc and near the summit of the Shimba Hills, where rainfall is high.

1.3 Main goods and services from main forest blocks

Virtually all coastal forests in Kenya have globally unique biodiversity values and most contain at least one endemic species (Burgess & Clarke 2000) and all deserve some form of recognition and protection. The high levels of poverty in

the region means that the population is highly dependent on forests resources for their daily needs (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 leading to widespread encroachment on public land to grow more food and extract resources from the forests in means and rates that are not sustainable.

1.1.1 Local values:

The Coastal Forests are used for many purposes in addition to timber production. Burgess and Muir (1994), assessed main local uses: pole collection; pitsawing; religious (spiritual) sanctity and ceremonies; gathering of medicinal plants; and clearance of forests to grow crops (agriculture); collection of edible plants and honey; mining and building hotels mainly for tourism. Coastal forests provide a source of building wood and charcoal energy (90% rural house-hold energy and 85% of urban household consumption) to the growing towns of Malindi, Watamu, Kilifi and Mombasa. Coastal Forests are the major known reliable source of pole wood (best poles from mangrove) used by local people for construction purposes. Pole cutting is concentrated in areas closest to human populations (Hall and Rodgers, 1986). Like many other places, coastal forests in Kenya provide a main source of medicine (70-80 %) for the poor local populations (Kokwaro 1976; Mogaka 1992). Edible mushrooms are widely collected from coastal forests. Household incomes in Arabuko-Sokoke Forest have been transformed through modernized and coordinated extraction and marketing of coastal forests products e.g. in 2001, the communities around Arabuko-Sokoke Forest earned around 37,000 dollars from guiding, bee-keeping and butterfly farming. In the Shimba Hills local communities within Mwalunganje conservancy, have earned incomes from tourism through the development of lodges. However all these activities have problems caused by weak organizational structures and procedures, market constraints and limited technical skills. The honey business is limited by problems of scale, technical skills and processing. Other uses for Tanzania (Rodgers, 1993) but applying to Kenya 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 tooth brushes; 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 other liane species are used as rope. Bush meat is another valuable use of coastal forests by the poor local people who can hardly afford to buy livestock and chicken meats from the near by towns. *Brachystagia huilliensis* "Muhugu" (from Arabuko-Sokoke Forest) and Mpingo are major sources of carving material, though harvested illegally. Among many values, Mangroves are 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*. Ironically, of the total number of mangroves poles sold in Mombasa (from 6,500 score (bad year) to 14,000 scores (good year) some are exported to Middle East countries. A total of 3,262,000 poles (equivalent to a volume of 24,262 m3) is estimated to be consumed annually in house building (Wass, 1995). Hotels and Villas consume larger sizes of poles than traditional house construction (Gachanja and Violet, 2001). Other coastal forests uses and values (especially mangrove) include: high quality mangrove honey (available at Malindi, Kipepeo in Arabuko-Sokoke Forest and Nature Kenya office in Nairobi); poles for fishing traps; Fishing net floats; Tannin for fishnets and leather industries; Fisheries (Fish use mangrove areas and creeks as shelter, feeding and nursery grounds); Oysters (Oysters fix themselves on mangroves predominantly *Sonneratia alba* and *Rhizophora mucranat;* Chale Island mangroves are the only mangroves used as Kayas. Many of the cooking utensils and handles of tools used in villages are made from hardwood that often come from forests (Lagerstedt, 1994). 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. 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). In the Arabuko Sokoke Forest, 30-40% of people collect wild honey from the forest (Mogaka, 1992). Coastal forests are major sources of water that sustains the local people and wildlife.

1.1.2 National level values

Due to their proximity to Mombasa and Malindi, coastal forests 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 though improvement is needed. Revenue is mainly collected for entrance and use of other facilities. Watamu Marine Reserve and Mida-creek board walk (constructed by A Rocha Kenya) is another tourist destination area with benefits flowing to local people.

Some of the coastal forest are being developed for ecotourism, e.g. in Arabuko Sokoke (through Birdlife International—EU Funding and Nature Kenya—USAID Funding) walking nature trails have been cleared to attract tourism providing;: opportunity to walk; scenery attractions; bird watching; mammals viewing; and butterfly exhibit. 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 birdlife, mollusks and crustacea and crocodiles are abundant.

The coastal forests are rich in minerals (mainly titanium and lead) making mining to be a value not only to local people but also 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 but they remain devoid of valuable natural vegetation cover (Matiku *et al* 1998). 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 forming 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 and has potential for eco-tourism.

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 in Kenya. 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. Noteworthy, mining is a desired evil and must be properly managed to ensure that other coastal forest values e.g. timber, energy, pole wood, medicine, biodiversity, tourism, ecotourism, carbon sinks, water catchment etc are not compromised.

Woodcarving industry at the coast has a big potential in generation of wealth and employment. Currently it 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* (Mhugu, Muhuhu or Mahogany mainly from Arabuko Sokoke Forest) and *Combretum schumanii* (Mkongolo). Main wood carving species, *Dalbergia melanoxylon* (African black wood - Mpingo) has been depleted from source areas mainly in Ukambani. There are few commercial exotic plantations for production of timber at the coast compared to other regions, however, the available few are important at the national level as they provide raw materials for construction and should be targeted for improved management and production.

1.1.3 Regional and global values

Coastal forests are home to globally threatened fauna and flora; provide resting and leisure sites for tourists and generate revenue not only to local and national economies but beyond e.g. British Airways; ameliorate local and global climate; act as carbon sinks; have unexploited pharmaceutical potential; and are major supporters of development and energy sectors. Coastal forests provide carving wood for tourist souvenirs and are key research fronts for international researchers. The biodiversity value, research, and potential use are probably the most important global uses and values.

1.4 Biodiversity Value

The coastal forests of eastern Africa are recognised as an area of global importance for their concentration of narrowly endemic plants and animals (Statterfield *et al.,* 1998; Olson and Dinerstein 1998; Mittermeier *et al*., 1998). Half of Kenya's threatened woody plants occur in Coastal forests (Wass, 1995). These Coastal forests, combined with Taita Hills complex and the mountains east of the Rift Valley, account for almost all the rare forest biodiversity in Kenya, with a few other rare species scattered across the large blocks of montane forests. 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 national, regional and global importance of this region despite its relatively small forest cover. The Kenya coastal forests are part of the EACF hotspots. Conservation International ranks it 11th in species endemism and BirdLife International ranks it as one of the most globally important Endemic Bird Areas (Bennun &Njoroge, 1999). 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. 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, East Coast Akalat and the Spotted Ground Thrush – a rare immigrant). 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 have 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 at-least 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 ecoystem is also rich in biodiversity with total of 57 mammal species identified. 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 is also home to about 60 primary fresh water fish species.

Table 2: Summary of species outcomes for the Kenyan Coastal Forests Hotspot (Adapted from CEPF, 2003)

Taxonomic Group	Number of Species listed by IUCN Red Data Book status			Total
	CR	EN	VU	
Mammals	1	4	4	9
Birds	2	6	2	10
Amphibians		1	2	3
Gastropods		3		3
Plants	5	11	64	80
TOTAL	8	22	72	102

Table 3: Coastal Forests with at least two threatened species in IUCN Red List (Adapted from CEPF, 2003)

Forest	Number of threatened species		Total
	Animals	Plants	
Shimba Hills	10	46	56
Arabuko Sokoke	11	8	19
Diani (Medium Kwale)	3	8	11
Gongoni (M. Kwale)		11	11
Kaya Ribe		10	10
Mrima Hill (M. Kwale)	3	7	10
Lower Tana River	4	6	10
Buda (M. Kwale)		9	9
Pangani		9	9

Witu		9	9
Dzombo Hill Forest	1	7	8
Kaya Jibana		8	8
Kaya Ukunda	1	1	2
Kaya Waa	2		2
Shimoni Forest	1	1	2

1.5 Main threats to the forest ecosystem

The most important threats include: poverty; poor governance and management; inadequate technology, knowledge and incentives for alternative livelihoods and environmental awareness; Population growth; limited coordination and landscape focus; overexploitation of forests on private land, ranches and trustlands; and increased wildlife population (Elephants). Poverty manifests itself in many forms: involvement in illegal activities; hunting and gathering of foods and other products; inappropriate agricultural practices hence low yields and need for more land; all these leading to: illegal cutting of materials such as poles and fuelwood; forest clearing for cultivation; and overexploitation of forest products. Poor governance and management manifesting itself in many ways: breakdown in management; inadequate operating funds; no demarcation and survey of boundaries; inadequate land use planning; poor extension services; inadequate protection; inadequate participation of local communities in management; inadequate data on allowable cut and forest regulation; inadequate secure tenure; rampant corruption; inadequate monitoring; no impact assessment of policies; unplanned settlement and infrastructure and land grabbing resulting to among others encroachment on forests, rampant illegal activities, unsustainable cutting, deforestation and inadequate options for alternative livelihoods (WWF-EARPO, 2002).

Encroachment, illegal exploitation, deforestation, fires and overgrazing are the main results from inadequate technology, knowledge and incentives for alternative livelihoods and awareness through inappropriate agricultural practices, inadequate interest in conservation, in adequate alternative livelihoods options, low appreciation of consequences of biodiversity loss, weak civil societies and poor land use choices. Rapid population growth lead to high demand for fuel wood, unplanned settlement and instructure, and land grabbing resulting to unsustainable use of forest and animal products. Piecemeal conservation efforts, short term projects, inadequate continuity in conservation activities, inadequate coordination among different projects and inadequate coordination between conservation and development activities are caused by limited coordination and lack of landscape focus leading to reduced effectiveness of conservation initiatives and donors. Overexploitation of forests on private land has lead to increased pressure on coastal forests, ad-hoc ban on exploitation and land degradation resulting to the single most important threat, illegal exploitation and unsustainable use. The problem of increased wildlife is mainly due to the blockage and occupation of migratory routes by humans concentrating animals e.g. elephants in Shimba Hills to areas less than historical range.

Many conservation projects have tackled the issues of alternative livelihoods and of communal exchange and networking. The creation of alternative livelihoods is a useful local approach for civil society, especially when combined with good law enforcement by those institutions responsible for forest management. The problems of communal exchange and networking are now much less serious than they were, thanks to the growth of communications technology, and to the increasing effectiveness of workshop and community outreach techniques.

The inadequate existence of capacity for local mechanisms on controlling forest exploitation reflects both a breakdown in cultural traditions, and the fact that the Kenyan governments took such matters out of the hands of the local people sometime ago. That so little forest remains, outside Forest and Local Authority Reserves, suggests that the government interventions were ill advised. Where there has been continuity in forest protection by local communities, as in the case of some of the *Kaya* forests in coastal Kenya, there has been real success, and the prospects for replication with other sacred forests e.g. Tanzania is good. Weak forest governance is pervasive in the region, and is being increasingly addressed by involving more stakeholders, particularly among the local communities and civil society (CEPF, 2003). The issue of inadequate and poorly directed fiscal resources afflicts nearly every government department in Kenya, especially since the implementation of Structural Adjustment Programmes. A good example is provided by Arabuko-Sokoke Forest. In 1998/99, the Forest Department spent $106,497 on this 417,000 ha forest (Muriithi & Kenyon 2002), out of which 98% ($104,536) was used to pay salaries leaving $2,114 for operational costs. In 1998, $7,536 was raised from this forest from fines, rents, timber royalties, and sales of fuelwood, polewood and Christmas trees.

The WWF-EEARO Coastal Ecoregion planning workshop (2002), analyzed and prioritized poverty, lack of alternative livelihood options for populations living adjacent to the forests, inadequate law enforcement, low awareness of the value of coastal forests and consequences of their loss, lack of cultural values for and indigenous knowledge on forests and inadequate information on the forest resource as the most important threats. Inadequacy of environmental impact assessments was cited as a cause of inappropriate agricultural practices in Kenya (CEPF, 2003).

1.6 Main socio-economic/political/policy related issues

Kenya is grouped among the poorest nations in the world. The per capita income ($271) is very low and 43% of Kenya's population earn less than 1 dollar per day. Economic growth rate is equally low (1.2%). From 1963 – 1973 GDP grew by 6.6.% (US State Department Country Reports, 2002a) but by 1997 dropped to 2.3%, then to 1.8% in 1999 and became negative (0.4 percent) in 2000 (USAID 2000). Despite the high biological importance, legal protection for important areas in the region is either weak, lacking or poorly enforced. Most sites lack strategic management and action plans. However, these problems are widely recognized and various initiatives (including institutional, policy and legislative reforms) have been launched to address them. In particular the Poverty Reduction Strategy Paper (PRSP) for Kenya highlights strategies to be employed by the Kenya government in an attempt to alleviate poverty including among others the rural poorest. 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, Taita Taveta and Kilifi/Malindi. Kenya has experienced very hard economic times over the last decade, with an average 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.

Although the population of the coast province is generally poor, the 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 4 below shows the level of poverty in the Coastal districts according to three poverty indices. Food poverty refers to those, whose expenditure on food does not meet the recommended daily calorie intake, while absolute poverty 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 4: 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

Average household size at the coast e.g. around Arauko-Sokoke forest is more than 13, and 55% of the households consist of multiple families. The population has greatly increased e.g. density of Kilifi District has risen from 47 to 60 people per km^2 between 1989 and 1997 (Government of Kenya 1997). The original population of the coast was mainly the hunter-gatherer type e.g. Sanya tribe. Prior to forest gazettement e.g Arabuko-Sokoke Forest in 1932, the local people used the forests freely for their subsistence needs. Subsistence agriculture is the main occupation of the coastal population based on production of maize, cassava and beans, with income supplemented by cash crops such as cashew, mango and coconut. Agricultural land is generally poor, and crop yields are low. The mean size of farm holdings around Arabuko-Sokoke Forest (like other coastal areas) is 6.9 ha (0.5 ha per capita) with farms growing an average of 1.6 ha of maize. Most households own goats (average of 5 per household) but tsetse flies and a lack of grazing are constraints to cattle keeping at the coast. Although many uses of the forest for subsistence or income generation are illegal they still continue. Forest usage includes collection of water, fuelwood, poles, and herbs, butterfly farming and hunting of wildlife for meat. Participatory assessments with local communities indicate that building poles are perhaps the single most important product used from the Arabuko-Sokoke forest and the same can be predicted for other coastal forests.

Responsively, Kenya is in the process of updating policies and legislation on forests and the environment. An updated Kenya Forest Policy has been developed and is in the process of being officially approved. The proposed forest policy allows reservation of all gazetted indigenous forests; woodlands, bushlands and mangroves to be managed by state approved agencies which will allocate them primarily for: (1) regulated multi-purpose forestry, using zoning concepts which do not endanger the conservation functions of the forest; (2) preservation of biodiversity; (3) conservation of soil and water; and (4) providing products and services mainly locally on a subsistence basis, by community participation where appropriate. Joint management of certain forests with communities and environmental NGOs was undertaken on a pilot basis e.g. Arabuko-Sokoke Forest. Since the new government took office at the end of 2002, official statements have indicated that the new forest policy and legislation will soon be approved and put into effect. The bill is much more

comprehensive than the act it will replace and covers issues of community participation and multiple stakeholders in forestry hence can be assumed that illegal use by local communities will be a thing of the past once the policy will allow official involvement and collaboration of local communities in forest management and protection. However, guidelines for participatory Forest Management have not yet been agreed though a draft exists. Decrees and moratorium also exist: currently no extraction of timber and other forest products from any state forest reserve; timber extraction from indigenous forests is prohibited. In addition to the Forest Act, there are about 77 statutes that deal with environmental legislation. Unfortunately, all revenue collected goes to the government treasury and there exists no policy framework providing for flow of park revenue collection to local communities. Pilot programmes exist e.g. A Rocha Kenya has constructed a simple board walk at Mida Creek whose revenue goes to the local communities. However, the Kenya Wildlife Service has internal planning policy pronouncements providing for a percentage of revenue going to local communities development projects but the impact remains rather small and local communities have not associated themselves with the benefits. Currently, local people are not allowed to kill any form of wildlife for whatever form of use yet they are expected to bear the cost of damages caused by wildlife. This is a major source of conflict between park management and local communities. In 2000, Parliament passed the Environmental Management and Coordination Act (EMCA) 2000 as framework legislation. The EMCA takes priority over all pre-existing legislation. The EMCA establishes national environmental principles and provides guidance and coherence to good environmental management. It also deals with cross-sectional issues such as overall environmental policy formulation, environmental planning, protection and conservation of the environment, environmental impact assessment, environmental audit and monitoring, environmental quality standards, environmental protection orders, institutional coordination and conflict resolution. The act provides a good avenue for environmental protection and the establishment of an operational framework under the National Environment Management Authority (NEMA). The wildlife Act Cap 376 is under review and new draft is expected to address the issue of compensation to loss of human life and property due to wildlife.

1.7 Main environmental issues

These include: over-exploitation of resources (including overgrazing); encroachment; fires; population/demographic pressure; inadequate policy/legislation and or conflicting/unharmonised policies; inadequate capacity; inappropriate land-use systems; illegal hunting of game; illegal timber harvesting for charcoal or other purpose; illegal trade on fauna and flora; and land degradation. The driving forces are issues whose solutions lye within the national governance, planning and decision making machinery controlled and determined by the Kenya government: limited security of tenure; policy failures and double gazettement; lack of appropriate alternatives to forest products and economic activities; unfriendly or weak economic/development policies; inadequate institutional and financial capacities; insufficient institutional strengthening; externally driven staff retrenchment programmes ignoring effects; unguided licensing of forest produce extraction; poor attitude to forest conservation and conflicting viewpoints; lack of participatory forest management and associated policy framework; poor law enforcement of existing legislation; tourism development; development and maintenance of infrastructure. Consequently: critical biodiversity is found outside protected areas; very small area of total original coastal forest area is under effective protection; protection status does not necessarily mean protection; acute people and protected areas/wildlife conflicts exist; serious and unacceptable habitat loss is taking place; there is inadequate public participation in forest management and conservation; and local community poverty is at unacceptable levels. The most critical and therefore requiring urgent attention by all forest sector players is the issue of unacceptable high levels of unsustainable use, extraction and harvesting of forest resources and products resulting mainly from impoverished local communities.

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. Tree tenure where communities are guaranteed of owning tress planted on land without individual tenure could be an option but is lacking hence local communities are not willing to plant tress on land they do not own. This has denied the coastal region the opportunity to develop cheap alternatives to pole wood, fuel wood, and construction which are among the most important threats to the remaining small forests.

2 Main Stakeholders involved in coastal forest conservation management in Kenya

3.2 Government institutional roles and responsibilities in Kenya's forestry sector

The key stakeholder is largely the Forest Department (FD), the national institution mandated to manage Kenya's forest reserves and commercial plantations. The second important partner is Kenya Wildlife Service (KWS0, the chief custodian of all fauna and flora in Kenya. Others include: the Kenya Forestry Research Institute (KEFRI) responsible for research on forestry issues; the National Museums of Kenya (NMK)responsible for biodiversity research and natural history; and the National Environment Management Authority (NEMA)responsible for coordinating environmental matters for Kenya. At a few sites, all the four are represented in multi-institutional management teams (e.g. the Arabuko-

Sokoke Forest Management Team at Arabuko-Sokoke Forest). Key forest action oriented government units include: Public Complaints Committee and Environmental Impact Assessment Committee within NEMA; Forest Coordination Unit at KWS; Forest Inspection and Protection Unit (FIPU) of FD; and Seed Centre at KEFRI. The Ministry of Planning and National Development has a cross-cutting responsibility touching on forests as a tool for development and economic growth.

The Forest Department has the major mandate 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. Most forest officers are trained in silviculture, therefore, biodiversity conservation, to them, is incidental. However, the Forest Department has identified this gap and has identified a biodiversity unit at headquarters in Karura Forest. In a further bid to fill the gap, Nature Kenya (the EANHS) is training foresters to fill the gap but still biodiversity capacity gaps in the FD remain critical. The FD has many problems: resources are limited; salaries are too low and staffing levels are inadequate for keeping the department fully operational; a high percentage of the department's total budget goes to salaries; equipment to deliver services are severely limited; and biodiversity technical capacity is inadequate. There are plans for transforming the department into a new body to be called the Kenya Forest Service. The FD is the main stakeholder whose capacity and governance 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 FD to address biodiversity and community livelihoods and alternatives.

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 memorandum of understanding (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. Unfortunately, policy and legislative framework to operationalise MoUs is either lacking or capacity to operationalise does not exist, hence institutional rivalry and conflict characterize the operations of the two departments. The role and capacity of KWS to manage indigenous forests and the capacity of FD to manage industrial plantations and to work with a multiplicity of stakeholders including local communities and private sector needs addressing. KWS has better paid well trained armed rangers more effective than their forest counterparts who have low morale, are grossly underpaid and rarely get anything done. KWS with more equipment (e.g. cars) than FD means that they are better placed to guarantee protection than the FD. KWS and FD play complementary roles and both need each other to effectively manage forests. Unfortunately, KWS has always viewed FD as lazy, disinterested with forest conservation and liability to the forest sector while the FD has viewed KWS as well equipped, well paid and interested with FDs mandate resulting into institutional conflicts but the truth is that the two institutions need each other if effective forest management is to be achieved.

The National Museums of Kenya (NMK) was subsequently included in the MoU under an addendum that recognized its role in cataloguing, researching and conserving forest biodiversity. NMK has also been responsible for the surveying and gazetting of sacred coastal forests as national monuments, through the Coastal Forest Conservation Unit (CFCU). KEFRI enhances the social and economic welfare of Kenyans through user-oriented research for sustainable development of forests and allied natural resources. 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 is responsible for research in the coastal forests region. The role of KEFRI, FD, KWS, and NMK need to be better integrated to promote synergies for coastal forests conservation in Kenya. KEFRI team at the Gede Centre at the coast province is technically qualified but the need to establish a new centre down south coast is a welcomed major positive development.

Staff at all these departments (NMK, KWS, FD, KEFRI) need training on participatory forest management (PFM), so to help train a cadre of site-based extension officers who recognize and include the views of local communities in to forest leadership, governance and sustainable use. The National Environment Management Authority (NEMA) established by an act of parliament ‘Environmental Management and Coordination Act (EMCA) of 2000”, has overall responsibility for coordinating environmental management issues in Kenya. Among other things NEMA is empowered by EMCA to: establish provincial and district environment committees and the public complaints committee; set procedures for environmental planning including action plans; set measures for protecting coastal forests; prescribe conditions for Environmental Impact Assessment (EIA); provide measures for environmental restoration; establish standards and environmental review committee; and set out environmental offenses. With respect to forests and forest conservation and among other things, 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 (section 44 and 47) and provides for EIA of forestry related developments. However, the role of NEMA is limited until the many guidelines and procures are developed. In view of this, speedy capacity building for NEMA to be able to implement this important mandate is a critical.

The coastal forests in Kenya fall under the jurisdiction of Lamu, Malindi, Kilifi and Kwale District councils. These are known to be responsible for any un adjudicated government land but is highly characterized by mismanagement. It might be a worthwhile consideration to put all county council forests under some form of more formal protection. They do not have trained officers to manage forests and even if they did, they lack a business focus to land management. They are very well placed to manage government land within urban areas mainly marked for town development.

3.2 Nongovernmental Organizations

In the recent past, NGOs have greatly assisted the Forest Department during periods when donor funding was difficult to get for government departments. 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. Nature Kenya was one of the implementers for BirdLife's IBA project and it published the IBA book for Kenya (Bennun & Njoroge 1999) and has further identified species and sites that need immediate attention in the coastal forests of Kenya and Tanzania. Nature Kenya is particularly active in Arabuko-Sokoke Forest and has a strong programme on establishing and building local and national constituencies for biodiversity conservation in Kenya. Nature Kenya is leading in the development and implementation of a nation-wide IBA monitoring framework with strong emphasis on government and local community capacity building. The EAWLS is host to the Kenya Forests Working Group (KFWG), which is a coalition of NGOs and of anyone interested in forests and which has been an extremely important focus for civil society action against government policies that have threatened Kenyan forests. National NGOs in Kenya include A Rocha Kenya (ARK) in Watamu and the Forest Action Network (FAN) in Nairobi. FAN has been active on matters on policy and legislation.

1.1 Problem analysis

All government institutions and NGOs in the region are useful and play an important role but two main institutions are critical to the effective management of the coastal forests: KWS and FD. The FD is the lead institution which should be involved at all stages of the project development. The FD will be responsible for owning the results and ensuring sustainability and replicability elsewhere in Kenya. However, if FD is to perform its functions effectively, some minimum capacity is critical: 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; and strengthening district foresters capacity to carry out their work.

The second most important institution and partner to FD with responsibility for managing wildlife is KWS and also needs some capacity development: 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; and support to pass new wildlife act recognizing local communities.

2 Main challenges and threats to conservation and sustainable management of EACFE

The main threats identified by the WWF-EARPO workshop in 2002 include: unsustainable use leading to pressure on forest resources (Timber; Pole wood; Charcoal; Carving wood; Hunting; Tourism; Salt Mining); Agricuture (Cultivation; Encroachment; Fire; over grazing); Settlement; Urbanization; Lack of legal protection; and wildlife human conflicts. Poverty manifesting itself through corruption and illegal harvesting (logging), over exploitation; lack of opportunity to think beyond immediate needs; vulnerability to corruption; and involvement in illegal activities is the most important threat to coastal forests in Kenya. Illegal logging in particular is responsible for opening up coastal forests leaving shells of land in the name of forests. The main exacerbating factor to illegal logging is weak forest act made worse by its poor uncoordinated implementation; low staff morale; lack of comprehensive policy on restoration of indigenous vegetation and inadequate involvement of local communities and private sector in forest conservation and management. 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. This 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.

Declining respect to traditional forest protection systems is an emerging threat and cause of forest loss. 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. 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.

Development in the Tana River Forests has led to reduction in the population of Red Colobus and Crested Mangabey 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. 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. Mining through 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.

Most environmental issues in the coastal forests of Kenya region manifest themselves inform of direct threats due to unsustainable use and extraction of forest resources and products for local national and global benefits. However, more often than not, the driving forces are issues whose solutions lye within the national governance, planning and decision making machinery controlled and determined by the Kenya government. The most important of these include but are not limited to: limited security of tenure; policy failures and double gazettement; lack of appropriate alternatives to forest products and economic activities; unfriendly or weak economic/development policies; inadequate institutional and financial capacities; insufficient institutional strengthening; externally driven staff retrenchment programmes ignoring associated obvious effects; unguided licensing of forest produce extraction; poor attitude to forest conservation and conflicting viewpoints; lack of participatory forest management and associated policy framework; poor law enforcement of existing legislation; tourism development; development and maintenance of infrastructure. Consequently: critical biodiversity is found outside protected areas; very small area of total original coastal forest area is under effective protection; protection status does not necessarily mean protection; acute people and protected areas/wildlife conflicts exist; serious and unacceptable habitat loss is taking place; there is inadequate public participation in forest management and conservation; and local community poverty is at unacceptable levels. The most critical and therefore requiring urgent attention by all forest sector players is the issue of unacceptable high levels of unsustainable use, extraction and harvesting of forest resources and products resulting mainly from impoverished local communities. According to Rodgers and Burgess (2000), 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.

Threats specific though not limited to Kayas include: dumping of wastes from hotels in South Coast; conversion to agriculture by especially the younger generation; illegal logging; road construction e.g. a road was constructed across Kaya Bombo; Seasonal fires caused by farmers adjacent to the Kayas; construction of tourist hotels and beach cottages. E.g. Kaya Chala; excessive tourists visit as the case of Shimoni Cave Grove because of bat roosts; charcoal burning resulting from poverty and lack of affordable energy alternatives; limestone quarrying. E.g. Kaya Kambe and Pangani Rocks Sacred Grove in Kilifi where marble quarrying threatens the existence of the quarrying; manual iron ore quarrying e.g., mining at Kaya Kauma for sale to Bamburi Cement factory Co Ltd in Kilifi district.

Some Mangrove forests specific threats include: 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 (Iran, Saudi Arabia, Dubai, Iraq, Kuwait, Bahrain) and Somalia in Africa despite government ban in 1982. Mangrove conversion for pond culture and for saltpans is highest at Ngomeni in Malindi District. Other causes of mangrove ecosystem degradation are: damping of solid waste and non-biodegradable materials, sewage and industrial toxic wastes; oil spillage from the port area e.g 1998, accidental oil spills from punctured tank killed two hectares of healthy mangroves near Kibarani; 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.

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 by ever increasing poor human population. Charcoal burning is prevalent in woodlands where the local communities do not have secure individual or communal land tenure. Tree tenure where communities are guaranteed of owning trees planted on land without individual tenure could be an option but is lacking hence local communities are not willing to plant trees on land they do not own. This has denied the coastal region the opportunity to develop cheap alternatives to pole wood, fuel wood, and construction which are among the most important threats to the remaining small forests cover.

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. For forests on public land, the threats take the form of encroachment and excision. 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. Unlike unsustainable 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. The threat of unsustainable cutting for poles, timber, and fuelwood was previously serious in such forests as Shimba Hills and Arabuko Sokoke. Cutting of *Brachyleana hulliensis* for carving is a serious threat wherever the species is found, but the involvement of KWS and communities in forest protection has reduced this considerably in some forests e.g Arabuko-Sokoke Forest (WWF-EARPO 2002; CEPF, 2003).

Ecologically, fires can be a tool for maintaining the structure of some ecosystems, and is a common phenomenon in some tropical woodlands. Fires started by arsonists from neighbouring farms have posed serious threats in the past to Coastal Forest patches such as the Kayas. 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.

Policy failures and double gazettement is witnessed in the Shimba Hills Forest which 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 and further creates conflict on development since different agencies have different development mandates e.g plantation development in Shimba hills failed because it is not a development mission under the Wildlife Act. 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. Certain policies and legislation e.g Agriculture, tend to focus attention on economic development leading to clearance of natural habitats to attain their goals. This has resulted to clearance of prime coastal forests and mangroves for establishment of tourism facilities, roads and agricultural projects. The government retrenchment programme has affected forest conservation in Kenya. While the Kenya Forest Master Plan recommends 32 people per station, it is not uncommon to find a station with less than 10 people and in other stations e.g mangrove forest areas like Ngomeni, Sabaki and Mto Kilifi do not have staff permanently stationed there to ensure forest conservation. Other issues related to this 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. The FD is the main stakeholder whose capacity and governance 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 FD to address biodiversity and community livelihoods and alternatives. Technical data in indigenous forest is inadequate leading to issuing of permits and licenses based on demand and general impression of local officers as to the capacity of forests to sustain the off take. There is urgent need to determine sustainable yields from the coastal forests. Conflicting view points on what coastal forests are, exist e.g. the local community at the coast view forest as a family source of land, food and fuel-wood while on the other hand, local and central governments look at forests as a source of employment and revenue through exploitation of timber and other forest products including rents. These conflicting views must be harmonized with those of international and local conservation community that forests are important gene pools for biodiversity areas and environmental buffer zones of value to the national and global community.

Participatory Forest Management (PFM) is inadequately provided for in the current Forest Act Cap 385 although a new forest bill will soon be tabled in parliament for debate has promise on this issue. The Forest Department has developed regulations of harvesting mangrove poles but the regulations have not been enforced partly because of lack of commitment due to underpayment or under staffing meaning that significant though not yet quantified local consumption

for firewood, domestic furniture making and house building go unnoticed but causing serious loss of forest cover. The FD extension service is either poor or not operational in some cases meaning that the very guidelines and provisions of the law are not understood by the pole cutters and other local community level forest users. 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 making forest encroachment a serious threat for coastal forests. Trustland forests have also been over exploited for charcoal. Law enforcement by mandated agencies e.g FD, KWS, Kenya Police, Local courts, Department of customs and excise and international agencies is highly uncoordinated leading to low compliance. Penalties awarded are not stiff enough to deter the illegal extraction. Some magistrates and the police are ignorant of the implications of less punitive measures that are less than the potential gains from committing offences. Fortunately, the new forest bill provides for steeper penalties to forest offenders. Unlike KWS Rangers, FD forest guards are not well trained hence cannot prosecute effectively. Tourism could be a major source of local revenue but tourism infrastructure (roads, information centers, foot trails, camp-sites, car parks, gates and signs) are poorly developed and accommodation facilities e.g rest houses and bandas either by private entrepreneurs or as government property should be established in most forest areas. Arabuko Sokoke and Shimba Hills have good basic infrastructure though the FD and KWS do not have the capacity to maintain them. Machinery and funds to maintain the infrastructure is lacking. The FD and KWS have engineering sections that maintain forest roads in Arabuko Sokoke and Shimba Hills National Reserve respectively but even these rarely achieve desired standards because basic needs like fuel and vehicles to transport people are inadequate. In other forests there is very little infrastructure and access from outside is often poor or impossible. Since 1982, there has been a Presidential ban on the felling of indigenous trees in natural forests. Despite this ban, indigenous trees such as *Milicia excelsa* (Mvule) have been heavily exploited for timber

The better side and source of hope is that the Forest Department has developed a forest policy and bill awaiting passing in parliament; draft PFM guidelines have been developed and FD is prepared to engage consultations with key stakeholders; the new government has suspended, re-interviewed and reinstated faithful forest officers in February 2004; the poverty reduction strategy paper (PRSP) is lined for implementation e.g. a bill in parliament once passed will provide for constituency funds which should trickle down to local people; the ministry of environment, natural resources and wildlife is committed to forests more than ever in the past e.g in January 2004, the minister in liaison with civil society and other government departments organized a very successful parliamentary workshop that achieved its objectives to sensitize legislators on importance of forests and the new bill; the ministry of development and national planning with support from the UNDP is engaged in a programme to link environment and development in the national planning agenda; the EMCA is now in-place and NEMA has been set up to help coordinate environmental issues in Kenya.

On the international front, 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, 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 WSSD.

4.1 Trade and issues

Trade in forest products within the coastal forest is undertaken through licensed and un-licensed means and can be linked directly to the threats and also the opportunities and incentives for forest conservation. A Rapid Trade Appraisal (Mbuvi 2004) revealed three forms of trade: i) Licensed trade where the government has issued a license or a permit for utilization and or marketing. Eg Kipepeo, firewood etc; ii) non-licensed but allowed trade where the government does not arrest or harass operators/sellers of forest products e.g. wild fruits and herbal medicine and plants; iii) Un-licensed and not allowed trade where the operators/sellers are arrested when found by the government because the activity is branded poaching e.g. trees protected by presidential ban or under CITES. Unfortunately, the Forest Department only records authorized extractions meaning that it is very difficult to monitor trade and harvesting for unauthorized forest products. Licensed and unlicensed commercial or semi-commercial utilization focuses on building poles, carving wood and hardwood saw-logs (KIFCON, 1994). The situation does not seem to have changed since then (Mbuvi, 2004). Other forms of trade include: ecotourism, wild meat, game viewing, Guiding, and culture. Key businesses are located in or around Arabuko-Sokoke Forest: Kipepeo involving the sale of butterfly pupae; honey through Kipepeo network as an incentive to diversity incomes and investment from kipepeo profits; Bioken started in 1980 promoting snakes exhibition, snake hiding; falconry involving breeding and exhibiting birds of pray; Centre for Rescuing Primates; and Baobab Farm at Bamburi started in 1971 to rehabilitate quarries is important for snake farm, game farming and butterfly exhibit. However, these businesses are mainly depended on tourists and tourism in general which has in the recent past registered a significant drop. The businesses are not well coordinated and there are government policy gaps that need addressing to allow and or reduce illegal use and trade of plants, animals and associated products. The lack of policy on game utilization encourages unlicensed trade. The key challenges include: Lack of policy on wildlife utilization; Unclear licensing procedures; Ignorance by the local people of existing laws on game trade; Lack of standard ways of monitoring trade and centralized licensing; Failure to file returns by some traders on time if at all; Poor records in local offices;

Unknown market and sources of game meat and plants; Lack of coordination between departments dealing with wildlife utilization e.g fisheries, KWS and FD.

5 Main Strategies/ Interventions adapted at national level for the conservation and sustainable management (Opportunities):

Kenya has a National Environment Action Plan (NEAP) completed and adopted in 1994. It proposed some strategic actions to be taken immediately: Formulation of a biodiversity strategy to maintain, use and preserve Kenya's remarkable biodiversity; Treatment of biodiversity conservation and economic development as integral aspects of the same process of sustainable development; Measurement of the value of standing, genetic resources and especially biodiversity in economic terms; Establishment of a system of incentives and dis-incentives so that resource conservers are rewarded and resource abusers penalised; Urgent action taken to conserve areas of outstanding biodiversity value; and incorporation of traditional values and knowledge systems into biodiversity conservation programs. Consequently, Kenya developed a National Biodiversity Strategy and Action Plan (NBSAP) in 1998. Among the national goals of the NBSAP are: to achieve sustainable utilisation of resources and ecosystem for the benefit of the present generations, while ensuring their potential to meet the demands of future generations; to maintain ecosystems and ecological processes essential for the functioning of the biosphere; and to preserve genetic resources and biological diversity in the nations ecosystems and to preserve their cultural value. Kenya's Interim PRSP (Government of Kenya 2002) includes a section on the forestry sub-sector in which forest degradation is identified as having "undermined long-term economic growth prospects and socio-political stability". The IPRSP further notes that "the resultant negative impacts are seen in agriculture, public health, tourism, energy generation, timber-based industries all of which are vital to peoples livelihoods". It recommends that "an improved policy and legal framework is needed to restore the integrity of Kenya's forest ecosystem, to reverse the mismanagement of the forests". In order to achieve this, the IPRSP recommends (among other actions) finding a role for stakeholder contribution in local forest management and decision making, and drawing collaborative agreements with communities, societies and advocacy groups.

An updated Kenya Forest Policy has been developed and is in the process of being officially approved. This policy will: increase the forest and tree cover of the country, in order to ensure an increasing supply of forest products and services for meeting the basic needs of the present and future generations and for enhancing the role of forestry in socioeconomic development; conserve the remaining natural habitats and the wildlife therein, rehabilitate them and conserve their biodiversity; contribute to sustainable agriculture by conserving the soil and water resources by tree planting and appropriate forest management; support the government policy of alleviating poverty and promoting rural development by income based on forest and tree resources, by providing employment and by promoting equity and participation by local communities; fulfill the agreed national obligations under international environmental and other forestry related conventions and principles; manage the forest resource, assigned for productive use, efficiently for the maximum sustainable benefit, taking into account all direct and indirect economic and environmental impacts and including a review of the ways in which forest and trees are valued, in order to facilitate management decisions; recognize and maximize the benefits of a viable and efficient forest industry for the national economy and development.

The Forest Department has allowed joint management of certain forests with communities on a pilot basis e.g Arabuko-Sokoke Forest. The new government has given official statements indicating that the new forest policy and legislation will soon be approved and put into effect. A new Forest Bill 2000 was prepared and published in January 2004. The bill is much more comprehensive than the act (Cap 385) it will replace and covers issues of community participation and multiple stakeholders in forestry. Further the bill proposes the establishment of a corporate body called the Kenya Forest Service which among other things the body will: (a) formulate policies for the management, conservation and utilization of all types of forest; (b) manage the use and conservation of all indigenous state forests; (c) monitor and enforce compliance with the provisions of this act in respect of all forests in Kenya; and (d) advise the government on all matters pertaining to the establishment, development, conservation and utilization of forests in Kenya. The Minister of environment suspended all technical officers within the FD and they have been assessed for suitability cleaning-out any lazy or previously corrupt officers. The Minister has further set up a Forest Sector Reform Secretariat to address institutional problems facing the Kenya's Forest Sector and to set up appropriate structures and mechanisms for an improved performing forest sector. A draft forest sector strategic plan (2004-2008) has been developed and is under discussion by both government and civil society stakeholders and PFM guidelines have been developed though not yet finalized. The Forest Department has further developed basic guidelines for developing Forest Management plans based on the experiences drawn from the Nature Kenya/BirdLife International initiatives in Arabuko-Sokoke Forest where a comprehensive example of a management plan and process exist.

The wildlife Act Cap 376 is under review and is expected to address issues related to promoting rural livelihoods and collaborative natural resource management among others e.g compensation and opportunity costs. The Ministry of Energy is developing a National Energy Policy which should provide for legalization of charcoal burning and

transportation opening up avenues for regulated trade and appropriate pricing for the benefit of local communities. The EMCA now implemented by NEMA, takes priority over all pre existing legislation and provides for cross-sectoral coordination to ensure environmental benefits. In addition there are about 77 statutes that deal with environmental legislation creating opportunity for successful implementation of desired programmes. In January 2004, the minister organized a Parliamentary Workshop to raise national awareness among all members of parliament as to the issues impeding forest conservation in Kenya and the need to pass the new Bill into law. The Ministry of Planning and National Development has initiated an initiative linking poverty and development in a national development and planning agenda. This UNDP funded project will raise awareness and develop tools and mechanisms for linking poverty and environment for sustainable livelihoods.

At international level, Kenya has ratified all relevant biodiversity conservation tools including the Convention of Biological Diversity (CBD) which has three main objectives: biodiversity conservation; sustainable use and access and benefit sharing of benefits arising from biological and genetic resources. Under the CBD Kenya is obligated to among other things identify, assess and monitor species and habitats and involve local communities and protect their indigenous knowledge and rights of access and benefit from biodiversity. The Convention on Migratory Species (CMS), RAMSAR convention, Biosphere Reserves Convention, Convention to Combat Desertification (CCCD) have also been ratified by the Kenya government. Kenya is a signatory to the World Summit on Sustainable Development (WSSD) and aligns itself its obligations including the Millennium Development Goals (MDGs) and the Water, Energy, Health, Agriculture and Biodiversity (WEHAB) initiative all recognizing and prioritizing biodiversity, sustainable use and poverty alleviation.

The Kenya government has functional links with the United States Urgency for International Development (USAID) where NEMA, KWS, FD, KEFRI and the Coast Development Authority are lined up for institutional programme support to undertake conservation interventions at a sub-set of Kenya's forests including the coastal forests in Kenya. The UNDP has a memorandum of cooperation with the Kenya government through which the Forest Department has been supported to develop the Forests sector strategic plan and the Ministry of Energy has been supported to develop a National Energy Policy as NEMA has been supported to produce the state of environment report and review the NBSAP. Relationship with international donor community e.g. the European Union, World bank, IMF and the GEF has been restored by the new government and promises for support have been made and some honored.

Nature Kenya in collaboration with 24 government and non-government institutions has developed a national framework for monitoring Important Bird Areas (IBAs) using agreed protocols which include forest monitoring protocols currently being applied at all IBAs which include key coastal forests and Kayas. Kenya is friendly and welcoming to NGO input as exemplified by many government-NGO collaborative programmes e.g. WWF, IUCN, ICIPE, AWF, ACC and other international NGOs have a memorandum of cooperation with the government as local NGOs and Societies are established by an arm of government and collaboration takes place e.g. Nature Kenya-KEFRI/KWS/NMK/FD partnerships in Arabuko-Sokoke Forest.

6 Main on-going programmes and projects relevant to EACFE

The CEPF (2003) compiled information on the projects operational in the Eastern Arc Mountains and Coastal Forest Mosaic as of February 2003. All data from projects that had already finished or that were to be completed in early 2003 were excluded from the study. Data were available for Kenya, although there were some gaps in the information. Data were collected by organization, type of organisation, by two subsets of sites: first, IBA and second, priority site (IBAs and non-IBA sites). The IBAs were selected as a subset because they had already been recognized as sites with global biodiversity values (Bennun & Njoroge 1999). The second subset was based on the sites with the greatest numbers of globally threatened species, as determined by CEPF (2003). Although the most important sources of external and government funding for conservation in this hotspot have been captured, some caveats are necessary. There are some gaps in the data and some budget allocations are split between several implementing partners, which made calculations of funding allocations problematic. Details of the government budget allocated to conservation activities in this hotspot were hard to come by, although as most sites are managed as reserves by the government their inputs are important. Hence the analysis was biased towards the externally provided funds from various types of agencies. The study identified only three sites among the 20 sites (in Kenya and Tanzania) that topped in the containment of threatened species: Arabuko-sokoke Forest receives the most funding (US$ 1300, 000) through Nature Kenya from USAID (3 year funding starting 2003) and Kindernothilfe and NABU (4 year funding starting 2004) in German. Government funding in Arabuko-sokoke Forest can be estimated to match that from external donors but it is not easy to quantify. Government support is seen inform of annual allocations to forest management by the different government agencies. Normally, funds to support staff to achieve their job descriptions is limited and is normally the incremental cost that external donors focus on. Spending for Shimba Hills in 2003 was some approx US$ 240,000 from USAID among other donors. In the same year Diani received US$ 50,000. The Columbus Trust, EAWLS and PACT Kenya are involved in initiatives within South Coast but actual amounts invested have not yet been determined within this analysis. The CEPF itself has earmarked some US$ 7,000,000 for spending in the eastern Arc and Coastal Forests of Kenya and Tanzania but actual

proportion to Kenya is not yet determined. The Coast Development Authority has recently received support from USAID but actual coverage on coastal forests is yet to be clear. The CEPF and USAID are therefore the major current supporters of the coastal forest conservation programmes in Kenya. WWF-EARPO has been involved in conservation activities in the eastern Africa coastal forest mosaics for 20 years. Over the past 10 years there has been a focus on the conservation of selected lowland coastal forest patches, mainly through the Kenya Coast Forest Survey Project, Kaya forest conservation, and study on the confinement of Elephants in the Shimba Hills National Reserve. There is need to commission a small study to carefully document the ongoing investment in the region but most important is the need to develop a donor and grantees coordination mechanism to ensure networking, information sharing and synergies between programmes.

7 Potential niche for action

There is need to: develop a collaboration framework for institutions and community groups involved in coastal forest conservation; develop policy and legislation frameworks and regulations to allow and support participatory forest management; strengthen government departments and local community organizations to undertake conservation and development activities; develop and implement clear participatory management strategies and rules for the forest management including specific focus to Kayas; expand livelihood choices and opportunities for local communities to reduce harmful dependence on forests; identify and develop alternatives sources of forest based raw material and incomes; develop sustainable funding systems, mechanisms and strategies for coastal forest conservation activities; complete and consolidate the coastal forest information database for use in conservation and management; enhance sustainable monitoring of forests resources building on Nature Kenya national monitoring framework; and maintain the public and policymaker's interest and awareness of forest conservation issues. Some specificities may include:

7.1 Enhance institutional capacities to undertake forest conservation and management mandates

The Ministry of Environment, Natural Resources and Wildlife need 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 title deeds for all gazetted forests; and revoke 2001 excisions. The Forest Departmentrequire: 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; and strengthen district foresters capacity to carry out their mandate. The Kenya Wildlife Service need awareness and some institutional strengthening to open up new stations; skills development for sustainable forest management, participatory forest management and general works with communities; capacity for law enforcement, and sustainable low cost monitoring; and awareness to finalize new wildlife act recognizing local communities as key stakeholders in the wildlife sector. The Kenya Forestry Research Institute need: empowerment and sensitization to set up a new research base at South Coast; capacity for training of trainers (ToT) on PFM; enhance capacity to collect, propagate and distribute seeds for restoring indigenous forests; and support sharing and dissemination of research findings. The National Museums of Kenya need: CFCU strengthened to address Kaya issues; support to undertake 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 in Mombasa; develop capacity to manage national monuments; and enhance nature-based businesses learning from Kipepeo. The National Environment Management Authority (NEMA) need physical push (not necessarily funds) so that they can respond to the expectations of Kenyans of what EMCA is supposed to be and do to the environment. NEMA must be pushed to strengthen their provincial and district committees to coordinate, monitor, and feedback information. Reportedly, in 2003 NEMA was unable to spent a significant proportion of the government allocation indicating that the institution faces problems related to lack of appropriate governance, leadership and coordination than actual resource deficits.

1.1 Enhance the capacity and ability of local communities to benefit from and contribute to coastal forest conservation:

There is need to build on the success of exiting initiatives to: develop businesses that benefit local communities especially the poorest poor; explore possibilities for direct payments and easements (Conservation Concessions) for biodiversity conservation and support where appropriate collaborating with the CEPF; build the capacity of community-based organizations in the region for advocacy in support of forest conservation; support cultural practices that benefit biodiversity; research and promote eco-agricultural options for the local populations; expand and diversify nature-based enterprises; support the Kipepeo exhibit in Mombasa to allow experiences sharing and learning among local community groups in the region; and enhance eco-tourism practices and benefits to local people.

1.1 Develop integrated community NRM plans:

Build on the Arabuko-Sokoke Forest management planning and PFM processes to expand to a sub-set of other priority sites

1.2 Improve local decision-making based on monitoring and analysis:

Build on the Nature Kenya monitoring framework to enhance basic and detailed monitoring. Develop biophysical and socio-economic indicators, set baselines and collect data feeding to the Key Biodiversity Areas data-base at the National Museums of Kenya for quality control, analysis by the National Museums of Kenya and dissemination by Nature Kenya, WWF and other civil society institutions. Build the capacity of CBOs to collect data at sacred Kayas and enhance their local decision-making by institutional support and monitoring.

1.3 Strengthen advocacy for sound forest management and conservation:

Build on Nature Kenya success in Kakamega Forest, South Nandi, Kikuyu Escarpment and Arabuko-Sokoke Forest to establish local constituencies for site conservation. This involves skillful setting up of sustainable independent site based institutions who have the capacity to negotiate rights of access, use and protection of forests. National advocacy fora e.g. National Liaison Committee, Kenya Forests Working Group (KFWG); Environmental Legislation and Policy Working Group (WLPWiG) and other networks will also need support to ensure high-level absorption and use of monitoring data, information and protection needs for coastal forests. Politicians and other high-level decision making cadres should be targeted for informed decisions in favour of coastal forests conservation and protection.

1.4 Implement standardized monitoring based on research and baselines:

Support research for less known sites and species; monitor populations of Critically Endangered and Endangered Species; compile and document indigenous knowledge; support awareness programs that increase public knowledge of biodiversity values; take stock of available resource; support survey of all forests and compile data.

1.5 Develop and support efforts for further fundraising:

Establish a professional resource mobilization unit, within an appropriate local institution, for raising long-term funds and resources to support initiatives; utilize already high-level WWF corporate contacts to secure funding from the private sector; engage local NGOs and train local community-based organizations in fundraising and proposal writing.

1 Enabling environment

1.1 Policies

Forest conservation in Kenya has faced heightened levels of threat over the last three decades and the root causes have been identified as Policy and market failures. Conservation policy regimes have failed to reflect stakeholder priorities and values over forest resources. Similarly, market distortions have culminated in the under-valuation of forest resources. As a result, forest development, conservation and management in Kenya have not been responsive enough to stakeholder needs and priorities thus further eroding the poor attitude towards forest conservation. Most of Kenya's conservation policies have been overtaken by events and need revision/updating as they no longer reflect the values, aspirations and needs of the society. However, Kenya has some key policies, legislative frameworks, strategies and action plans that if implemented can enhance the conservation of coastal forests in Kenya.

The Antiques and Monument Act Cap 215 of 1984 by National Museums of Kenya (NMK) allowed sacred Kaya Forests to become national monuments. The Act highlights: reservation of forest areas; conservation of flora and fauna; promotion of research and education; promotion of recreation/tourism; and provision of employment. The current Kenya forest policy assumes government funding for its full implementation and alienates local communities (private rights) in management of forests and there is not much reference to farm forestry providing very little hope for timber, fuel wood and charcoal alternatives to local communities. This policy has since been reviewed (*Kenya Forestry Development Policy 2000*) but it is yet to be published as a sessional paper for approval by parliament. The new policy takes into cognisance existing policies that are related to land use, environment, agriculture, energy and industry among others and key objectives include: to increase forest and tree cover to ensure an increasing supply of forests and services for the present and future generations; conserve the natural habitats, wildlife and biological diversity; contribute to sustainable land use through soil and water conservation, tree planting and appropriate forest management; contribute to poverty reduction, employment creation and promote equity through community participation; manage forest resources efficiently for maximum sustainable benefits; promote national interests in relation to international environmental and forest related conventions and principles. These objectives are inline with those of the WWF-EARPO EAFCE programme.

Kenya has a National Environment Action Plan (NEAP), a comprehensive policy document on the protection and management of the national environment and natural resources on a long-term basis. It was concluded 1994 and proposed a review of land use legislation and planning to reduce land use conflict and enhance protection of the catchment and

fragile ecosystems in particular indigenous forests. Further NEAP proposed the integration of forest management with sustainability in forests like Arabuko, Tana River and Shimba hills; inventory of Kenya's indigenous forests and stoppage of all excisions; mangrove ecosystems managed and conserved for sustainable use; continue Biodiversity and Socio-economic studies; strengthen forest planning to include Ecological protection; biodiversity conservation, subsistence use of NTFPs; ecotourism and Community participation. All these are consisted with the WWF-EARPO EACFC Programme vision. The plan also advocates for the review of other sectoral policies like agriculture, energy, land use and population.

Kenya has a water policy (Sessional paper No.1 of 1999), the first such national policy on Water Resources Management and Development. Its main objective is the supply and distribution of water resources throughout Kenya. It recognises that increased human activities in Catchment areas is a threat to water sustainability in Kenya. Kenya's wildlife policy is embodied in the "Statement on future wildlife management policy in Kenya" (Sessional paper no.3 of 1975) and the Policy framework and Development Programme, 1991- 1996 that was produced in 1990 (Zebra Book). Kenya Wildlife Service (KWS) defines its gaol in the book as: to conserve the natural resources (Flora and Fauna) of Kenya; to use wildlife resources of Kenya for sustainable economic development; and to protect people and their property against wildlife damage. This policy provides for very restrictive consumptive utilisation of wildlife especially after the hunting ban legal notice no. 120 of 1977. In the early 1990s, the compensation scheme was also withdrawn. EAFCE programme may prioritise the push for speedy review of this policy to allow local community involvement otherwise operations in high conflict zones in Tana, Diani, Shimba and Arabuko may be compromised.

The Agriculture/National Food Policy – *(Sessional Paper No.2 of 1994)*, summarises the land use situation and the intensity of land use required for self-sufficiency in food. The policy advocates for stoppage of further destruction of forests in both gazetted and trust land forests and does support conservation to some extent but fails to address the issue of access to forest land and its allied resources by communities and its emphasis on increased food production has been at the expense of forests as can be seen in Madunguni and Mangea hill where forest quality is affected by shifting cultivation. The National Energy Policy does not ban charcoal burning but does not provide for charcoal transportation and export making charcoaling an illegal activity and commodity yet it remains a key source of income and severe threat to coastal forests. This has been realised and the policy is being reviewed to legalise charcoal and establish code of conduct and regulation mechanisms so that private sector investment in energy sector can be promoted. There exists no comprehensive policy on fisheries but one is being prepared to be ready by June 2004. A draft Land Use Policy exists and relates to systems of laws, rules and regulations that govern rights and obligations. The tenure systems are not mutually exclusive as they are sometimes competing and at times have far-reaching effects on adaptive strategies and subsequent management of forests.

1.2 Legislation

Kenya has about 77 statutes relating to the conservation and management of environment. EMCA 2000, is the most important comprehensive recent legislation developed with input from Kenyans to reduce conflicts that existed between other sectoral legislative frameworks: Forest Act (Cap 385), Wildlife Act (CAP 376), Agriculture Act (Cap 318), Antiquities and monument Act (CAP 215), Fisheries act (Cap 378), Local Authority Act (Cap 265), Water Act (Cap 372), and Chief's Authority Act (Cap 128) among others incuding those governing land use and adjudication. The current Forest Act Cap 385 (revised in 1982 and 1992), soon to be replaced by an up-to-date legislation once the bill is passed, addresses preservation, protection, management, enforcement and utilisation of forests and forest resources on government land. The Act is applicable in the management of coastal forests, as 68% are forest reserves. Unfortunately, the Forest Department has been unable to implement the Act and forests have continued to deteriorate. This calls for urgent measures to instil discipline and capacity within the forest sector without which even the new so said good bill will be a total flop. The Forest Act gives the minister powers to make key decisions e.g. forest excisions in 2001 but can also make decisions in favour of forests e.g. PFM piloting in Arabuko-Sokoke but it is all a risky gabble. While the Forest Act does not hinder the achievements of key EACFC objectives, a new legislation will lead to a more friendlier environment and sustainability of investment as it will: cover gazetted, private and trust-land forests; address the needs of local communities and partnerships in management; and allow environmental protection and multiple use forestry and make it difficult to excise forests. The Kenya Parliamentarians have already been sensitised on the new bill (MPs workshop on forest management - Jan 8th -10th 2004 in Mombassa) making it easier for the bill to sail through once Parliament resumes in March 2004. The Environmental Management and Co-ordination Act 1999, aims at harmonising the various sector specific legislation that touches on environment so as to ensure greater protection of the physical and social environment. The WWF-EARPO EACFC programme has an opportunity to use the District Environmental Committees, (DECs) and Provincial Environmental Committees (PECs) created by NEMA under EMCA. The Wildlife (Conservation and Management) Act (Cap 376) covers mainly national parks, National reserves and Sanctuaries. The Act can be used to create parks but with parliamentary approval so the heightened level of decision making and legitimacy of the whole process ensures no grabbing of protected areas. Further, it can be used to protect coastal forests that are under threat from land grabbers. Game Sanctuaries (Covering not more that 2600 acres) can also be created under this act. Its

limitations are on user rights by landowners and wildlife utilisation. KWS established a community wildlife programme to manage wildlife outside parks and reserves and involve locals in management. The main focus has been to enhance economic benefits of communities living around wildlife areas but this has not worked successfully due to lack of capacity local community dealings. Since the Wildlife Act is mainly about wildlife and Forest Act about forests, wildlife in Forest reserves remained un managed. As a result, FD/KWS signed a Memorandum of Understanding (MoU) in 1991 for the management of selected forests like Arabuko, Shimba hills, and National Museums of Kenya joined in 1996 to form a tripartite MoU. Later KEFRI was enjoined bringing together the four most important government institutions responsible for managing and researching biodiversity and forests in Kenya. The Agriculture Act - Cap 318, promotes soil conservation and prevents the destruction of vegetation even within private land. The Minister can make rules under this Act, to prohibit, regulate, control clearing of land for cultivation, grazing or watering of livestock thus complementing the Forest Act. If properly enforced, this Act could be used to manage private lands for biodiversity gains. The Antiques and Monument Act (Cap 215) allows gazettement of sites as national Monuments (e.g. Kayas) but the National Museums mandate does not adequately cover management of forest resources in these sites. However, a window of opportunity exists in the MoU between FD/NMK/KWS/KEFRI. The Fisheries Act Cap 378 regulates trout fishing in the forests and protects fish breeding areas. It is relevant to mangrove management at the coast but often clashes with Wildlife Act, especially in the management of marine parks. Marine fisheries depend on mangroves as breeding grounds. Over-utilization of mangroves in Lamu has reduced fishery resources. The WWF EARPO EACFC Programme and WWF-EARPO EAME must link to ensure sustainable management of the mangrove system. The Local Authority Act - Cap 265 empowers County councils to make bylaws used to control cutting of timber, destruction of trees and shrubs and afforestation and authorizes local authorities to take measures necessary to control bush fires, quarrying for minerals, sand, gravel, clay or stones. The Act is applicable in trust lands but has been poorly enforced.

In Kenya, there are three main categories of land, namely government, private and trust land. Coastal forests fall in all the three categories. Land ownership and use is administered and regulated by the constitution (trust lands) and over 50 statutes that include: Government land Act (Cap 280), Land (Group Representation) Act (Cap 287), Trust land Act (Cap 288), Mazrui land Trust Act (cap 291), the Land Acquisition Act (Cap 295), Registered land Act (Cap 300), Land control Act (Cap 302), Land Adjudication Act (Cap 244), Physical planning Act of 1996 and the Mining Act (Cap 306) among others.

Trust Land Act (Cap 288)- sets out procedures to be used by local authorities in setting aside land for a variety of uses e.g. can be protection and management of trees and forests while the *Land (Group Representative) Act (Cap 287)* - provides for the registration of communal rights and interests in land e.g. group ranches where subdivision has been going on with massive clearing of vegetation and *Registered lands Act (Cap 300)* is registration of demarcated and adjudicated lands. The land Acquisition Act (Cap 295) allows acquisition of land but the constitution of Kenya protects private property, with restrictions on what the government can compulsorily acquire. Despite all these land related legal instruments land use planning activities remain haphazard and uncoordinated. As a result, the government in 1999 formed the Njonjo commission to look at land issues in Kenya. The commission completed its work in 2002 and produced a report whose recommendations are yet to be implemented. The Mining Act has no provision that makes damage to environment a criminal offence and there is no obligation of restoration of the environment. This has severe problems to coastal forests e.g salt mining in Malindi and Lamu and the proposed Titanium mining in South Coast are a threat to both mangroves and coastal forests including the Kayas.

Other enabling initiatives include: National Poverty Eradication Plan (NPEP); Poverty Reduction Strategy Paper (PRSP); FD five-year strategic plan (2003-2008) whose aim is to increase forest/tree cover by at least 10% of the total land area; Government-UNDP two-year programme (2004-2005) on Poverty Environment-Initiative that aims to enhance the integration of environment into policy and planning processes for poverty reduction and sustainable economic growth; UNDP- Kenya country programme to support the UN- Development Assistance Framework (UNDAF) in the promotion of good governance and realisation of rights and contribute to sustainable livelihoods and the environment. Also, Kenya has other avenues like the District Focus for Rural Development (DFRD) that was established through a government policy (Blue Book). It has no legal framework but the District Development Committees (DDC) set agendas for development in the districts. Economic Recovery Strategy for Wealth and Employment Creation – (2003-2008) takes into account existing government policy documents like PRSP, NARC Manifesto among others and defines key policy measures and programmes, which if implemented, will ensure rapid economic growth, creation of wealth and employment to reduce poverty. The plan considers forestry as one of the most important productive sectors to Kenyan economy, but it goes ahead to identify lack of information/inventories, weak legislation and lack of involvement of locals in management as some of the drawbacks.

This focus is in tandem with the government's commitment to improve transparency and accountability, by strengthening national institutions as a basis for increasing productivity. This is a necessity for raising economic growth and poverty reduction.

1.3 Regional agreements and conventions

Kenya is a member of several regional organizations like East African Community (EAC), COMESA, African Union (AU) and New Partnership for African Development (NEPAD). These regional bodies provide the potential for cross-border collaboration and sharing of lessons and development of structures for managing biodiversity at a regional scale. Kenya is party to a number of international conventions, agreements and treaties: The Convention on Biological Diversity (CBD); Ramsar Convention concerned with wetlands; African Convention on the Conservation of Nature and Natural Resources; Convention concerning the protection of the World Cultural and Natural Heritage; Convention on the prevention of Marine Pollution by dumping of wastes and other matter; International Convention for the Prevention of Pollution by ships; Bonn convention on the Conservation of Migratory Species of wild animals; Convention on International Trade in Endangered Species (CITES) of wild fauna and flora; United Nations Convention of the Laws of the Sea; and United Nations Framework Convention on Climate Change (UNFCCD) among many others. The CBD is a framework biodiversity convention that provides for collaboration and coordination mechanisms among many biodiversity related conventions. The CBD has developed programmes of work that help the implementation of other conventions e.g. RAMSAR and the conservation of marine and fresh water ecosystems; regime on access and benefit sharing that should link to CITES; dryland biodiversity and sub-humid lands that links with Climate Change and Desertification convention. The CBD, in its 7th Conference of Parties (COP7) developed a programme or work on protected areas highlighting the need for regional and global networks of protected areas. The WWF-EARPO EACFE fits within the CBD protected areas framework and approach to promote cross-border multi-country collaborative initiatives including the conservation of fly-ways e.g. through the African Eurasian Water Bird Agreement (AEWA) a tool developed to implement the Convention on Migratory Species (CMS) within the limits of the Africa-Eurasia Fly way.

There is, however, need for a national coordination mechanism to develop synergies between the various conventions, treaties and agreements for improved implementation, reporting and impacts on biodiversity. The government has identified lead agencies e.g. NEMA and CBD and UNCCD; KWS and CMS and AEWA, RAMSAR and CITES yet for many conventions it is not clear who the lead agencies are or what they are supposed to do to ensure implementation. Kenya has ratified the many conventions required to conserve species, habitats, ecosystems and to regulate trade but unfortunately, this has not been matched with the required resource investment to implement conventions. There is need to sensitise the government to prioritise conventions and their obligations to conventions for the benefit of present and future generations.

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Annexes

Annex 1: List of coastal forests in Kenya.

No	Forest Name	District	Cultural values	Protected Status	Gazetted/ demarcated area Ha	Min Forest Area Km2	Est Closed forest veg area (Ha)	Vegetation Type	Threat	Type of Threat
1	Boni NR	Garissa	No	NR	87000	100	10000	Woodland/bushland/forest	H	R,AG
2	Boni prop FR	Lamu	No	UP	18466	100	2000	Woodland/bushland	VH	Not protected; R, S, AG
3	Dodori NR	Lamu	No	NR	78100	20	8000	Woodland/bushland/forest	H	R, AG
4	Lunghi prop FR	Lamu	No	FR	9517	80	1500	Woodland/bushland	H	R, S,AG
5	Witu FR	Lamu	No	FR	3937	14	1400	Forest	VH	R,S,AG
6	Witu FR extension	Lamu	No	FR	10000	0.9	90	Forest	VH	NP,R,AG, S
7	Ras Tenewi area	Lamu, Tana River	No	UP		20	2000	Forest	H	NP,R,AG, S
8	Bura gallery forests (incl. Nanigi & Chewele)	Tana River	No	UP		1	100	Forest	VH	NP,R,AG, S
9	Arawale Reserve	Tana River	No	UP		100	10000	Bushland, grassland	VH	NP,R,AG, S
10	Wayu I, Wayu II, Wayu III & Kokani forests	Tana River	No	UP		100	10000	Forest	VH	NP,R,AG, S
11	Mbia	Tana River	No	UP		1	100	Forest	VH	NP,R,AG, S
12	Tana River Primate NR	Tana River	No	NR	17100	11	1100	Forest	VH	R,AG,S
13	Lower Tana forests (30+ patches, incl. 26)	Tana River	No	UP		10	1000	Forest	VH	NP,R,AG, S
14	Kanwe Mayi forest fragments (5 - 7 patches)	Tana River	No	UP		1	100	Forest	VH	NP,R,AG, S
15	Tana Delta	Tana River	No	UP		20	2000	Forest	VH	NP,R,AG, S
16	Dakawachu Hill	Malindi	No	UP		0.1	10	wodland/bushland	L	
17	North Malindi Brachystegia woodlands (4 sites)	Malindi	No	UP		300	30000	Woodland (part degraded)	H	R, S
18	Dakabuko Hill	Malindi	No	UP		5	500	Woodland	L	
19	Werune Cliffs	Malindi	No	UP		1	100	Woodland	L	
20	Ras Ngomeni dune forest & woodland	Malindi	No	UP		1	100	Forest / woodland	H	U, R, S
21	Devil's / Hell's Kitchen	Malindi	SG	UP		1	100	woodland	H	S, R
22	Kaya Bore	Malindi	Kaya	UP		0.4	40	woodland	VH	R, S
23	Kaya Singwaya	Malindi	Kaya	NM	10	0.1	10	Forest / woodland	L	

24	Kayas Dagamura, Starehe & Kilulu	Malindi	Kaya	NM	100	1	100	Forest/ woodland	L	
25	Kaya Bura	Malindi	Kaya	NM	100	0.5	50	Forest / woodland	L	
26	Kaya Bate	Malindi	Kaya	NM	25	0.25	25	Forest / woodland	L	
27	Mangea Hill	Kilifi	SG	UP		15	1500	Forest, degraded	VH	R, S
28	Gede Ruins	Malindi	No	NM	35	0.35	35	Forest	L	
29	Arabuko-Sokoke FR	Kilifi & Malindi	No	FR	41764	370	37000	Forest / woodland	H	R, S, U
30	Arabuko - Sokoke NP	Malindi	No	NP	620	6	60	Woodland/bushland		
31	Kizingo Hill	Kilifi	SG	UP		0.1	10	Forest, degraded	H	R, S
32	Rare River Gorge	Kilifi	SG	UP		0.1	10	Forest	H	R, S
33	Kambe Rocks Sacred Grove	Kilifi	SG	UP		0.25	25	Forest on limestone outcrop	H	R, S
34	Mulungu Mawe & Bikisaga SG	Kilifi	SG	UP		0.05	5	Woodland	H	R,S
35	Njora River Gorge	Kilifi	No	UP		0.1	10	Forest on limestone outcrop	H	R, S
36	North of Jaribuni forest patch	Kilifi	No	UP		0.1	10	Forest	H	R, S
37	Mnarani	Kilifi	No	NM	1	0.01	1	Forest	L	
38	Ndzovuni River Gorge	Kilifi	No	UP		0.01	1	Forest	H	R, S
39	Vyambani cliffs	Kilifi	SG	UP		0.01	1	Forest	VH	R, S
40	Kaya Maiowe	Malindi	Kaya	NM	60	0.6	60	Forest / woodland	L	
41	Kaya Chivara	Kilifi	Kaya	NM	150	1.5	150	Forest / woodland	H	R, S, U
42	Cha Simba Sacred Grove	Kilifi	SG	UP	20	0.2	20	Forest on limestone outcrop	VH	R, S
43	Kaya Fungo / Giriama	Kilifi	Kaya	NM	204	2.04	204	Forest / woodland	L	
44	Kaya Chonyi/Achonyi FR	Kilifi	Kaya	FR	200	0.2	20	Forest	VH	R, S
45	Vipingo Caves Sacred Grove	Kilifi	SG	UP		0.1	10	Forest	VH	U, R, S
46	Kaya Koyeni	Kilifi	Kaya	UP		0.07	7	Forest	VH	R, S
47	Kaya Mudzimuvia	Kilifi	Kaya	NM	171	1.71	171	Forest	H	R, S
48	Kaya Chivara	Kilifi	Kaya	NM	87	0.8	87	Forest	L	
49	Kaya Jibana FR	Kilifi	Kaya	FR	140	1.4	140	Forest	H	R, S
50	Kaya Tsolokero	Kilifi	Kaya	UP		0.25	25	Forest degraded	H	R, S
51	Kaya Kambe / Mbwaka Kaya & FR	Kilifi	Kaya	FR	75	0.6	60	Forest	H	R, S
52	Pangani Rocks Sacred Grove	Kilifi	SG	UP		0.4	40	Forest on limestone outcrop	H	R, S
53	Kaya Kauma	Kilifi	Kaya	NM	75	0.7	75	Forest		
54	Kaya Ribe	Kilifi	Kaya	FR	36	0.36	36	Forest	H	R, S
55	Bedida forest	Kilifi	Kaya	NM	30	0.3	30	Forest	H	R, S
56	Kaya Fimboni / Bomu	Kilifi	Kaya	NM	409	4.09	409	Forest	H	R, S
57	Mtwapa Creek north bank	Kilifi	No	UP		1	100	forest	VH	U, R, S
58	Mtwapa NM	Kilifi	No	NM	5	0.05	5	forest	H	U, R, S
59	Kaya Mzizima	Kilifi	Kaya	NM	29	0.2	29	Forest		
60	Kaya Mwidzimwiru	Kilifi	Kaya	NM	147	1.47	147	Forest, degraded	VH	U, R, S
61	Kaya Kauma	Kilifi	Kaya	NM	75	0.75	75	dry forest	H	R, S

62	Madunguni	Malindi	No	UP		2	200	Forest, degraded	VH	U, R, S
63	Nguu Tatu hill	Mombasa	No	UP		0.01	1		H	U, R, S
64	Kaya Shonda	Mombasa	Kaya	NM	10	0.1	10	Forest degraded	VH	U, R, S
65	Similani Caves Sacred Grove	Mombasa	SG	NM	10	0.1	10	Forest	H	U, R, S
66	Taru & Kilisa Hills	Kwale	No	UP		0.3	30	Forest degraded	H	R, S
67	Mariakani west forests (Kumbulu & Gobwe)	Kwale	No	UP		1	100	Forest/ woodland	H	R, S
68	Mwache FR	Kwale	No	FR	417	2.85	285	Forest	H	U, R, S
69	Kaya Gandini / Takawa / Duruma	Kwale	Kaya	NM	150	1.5	150	Forest	H	R, S
70	Kaya Mtswakara	Kwale	Kaya	NM	248	2.48	248	Forest	H	R, S
71	Kaya Chonyi (Digo)	Kwale	Kaya	NM	114	1.14	114	Forest/ woodland	L	
72	Mwaluganji FR	Kwale	No	FR	1715	14	1400	Forest degraded	VH	Elephants
73	Kaya Chitanze / Kitsantse forest	Kwale	Kaya	UP		0.1	10	forest	H	U, R, S
74	Kaya Lunguma	Kwale	Kaya	NM	155	1.55	155	elephant degraded forest	VH	Elephants
75	Kaya Bombo NM	Kwale	Kaya	NM	10	0.1	10	forest	L	
76	Kaya Kiteje NM	Kwale	Kaya	NM	10	0.1	10	bushland	H	U, R, S
77	Kaya Teleza / Dugumura Hill SG	Kwale	Kaya	NM	67	0.67	67	forest	H	R, S
78	Kaya Miyani	Kwale	Kaya	UP		0.2	20	Forest, degraded	H	R, S
79	Kaya Waa NM	Kwale	Kaya	NM	30	0.3	30	Forest degraded	VH	U, R, S
80	Shimba Hills NR	Kwale	No	NR	19260	63	6300	forest,woodland	H	R, S
81	Kaya Tiwi NM	Kwale	Kaya	NM	10	0.1	10	forest	H	R, S
82	Mkongani North FR / Shimba Hills	Kwale	No	FR	1113	[11]	11.13	forest	H	R, S
83	Kaya Diani NM	Kwale	Kaya	NM	20	0.2	20	forest	VH	U, R, S
84	Mkongani West FR / Shimba Hills	Kwale	No	FR	1366	13.66	1366	forest	H	R, S
85	Kaya Ukunda NM	Kwale	Kaya	NM	25	0.25	25	forest degraded	VH	U, R, S
86	Kaya Muhaka / Kambe / Mwadabara NM	Kwale	Kaya	NM	150	1.5	150	forest	H	R, S
87	Diani / Jadini Forest	Kwale	No	UP		0.8	80	coral rag forest	VH	U, R, S
88	Mwereni Brachystegia woodland	Kwale	No	UP		1.5	150	woodland	H	R, S
89	Dzombo (Jombo)	Kwale	Kaya	NM	902	9.02	300	forest	H	R, S
90	Kaya Galu/Ganzoni NM	Kwale	Kaya	NM	10	0.05	5	forest	VH	U, R
91	Kaya Ngalaani/Kinondo NM	Kwale	Kaya	NM	30	0.3	30	forest	H	U, R, S
92	Gongoni FR	Kwale	No	FR	824	6.35	635	forest	H	R, S
93	Buda Mafisini FR	Kwale	No	FR	668	6	600	forest	H	R, S
94	Kaya Chale / Chale Island SG NM	Kwale	Kaya	NM	50	0.25	25	forest	VH	U, R, S
95	Mrima FR	Kwale	Kaya	FR/NM	377	2.9	290	forest	H	R, S
96	Marenji FR	Kwale	No	FR	1529	15	1500	forest	H	R, S
97	Palm woodland, Ramisi (3 patches)	Kwale	No	UP		10	1000	woodland	H	R, S
98	Kaya Sega NM	Kwale	Kaya	NM	50	0.5	50	NM	L	
99	Chuna gallery forest	Kwale	No	UP		1	100	forest woodland	H	R, S
100	Gonja FR	Kwale	Kaya	FR/NM	842	6	600	forest	H	R
101	Miongoni gallery forest	Kwale	Kaya	UP		0.7	70	forest	VH	R, S

102	Shimoni forest	Kwale	No	NM	60	4	400	forest degraded	H	U, R, S
103	Kaya Jego NM	Kwale	Kaya	NM	10	0.1	10	forest	L	
104	Kaya Bogowa NM	Kwale	Kaya	NM	10	0.05	5	degraded forest	L	
105	Lunga Lunga gallery forest	Kwale	No	UP		1	100	forest woodland	H	R, S
106	Kilibasi hill	Kwale, Taita Taveta	No	UP		2	200	forest,woodland	H	R
107	Kitovu	Taita, Taveta	No	UP		0.5	50		?	
					298930		137925.1			
	KEY									
	NM=National Monument									
	FR=Forest Reserve									
	FR/NM= Dual site									
	NP=National Park									
	UP=Unprotected									
	SG=Sacred Grove									
	R = Resource Use									
	Ag = agriculture									
	S = settlement									
	NP = Not Protected									
	U = Urban									
	VH = Very High									
	H = High									
	L = Low									
	N = No Threat									

Annex 2: Kenyan Coastal Forests ranked in order of their biological importance defined by number of globally threatened species they host.

Sites		Birds	Amphibians	Gastropods	Mammals	Plants	Total
Shimba Hills	Kenya	3	2	0	5	44	54
Arabuko-Sokoke forest	Kenya	6	0	0	5	8	19
Diani	Kenya	1	0	0	2	8	11
Gongoni forest reserve	Kenya	0	0	0	0	11	11
Buda forest reserve	Kenya	0	0	0	0	10	10
Kaya Ribe	Kenya	0	0	0	0	10	10
Mrima forest	Kenya	1	0	0	2	7	10
Dzombo forest reserve	Kenya	1	0	0	1	7	9
Mangea Hill	Kenya	0	0	0	0	9	9
Tana river forests	Kenya	0	0	0	3	6	9
Witu forest	Kenya	0	0	0	0	9	9
Kaya Jibana	Kenya	0	0	0	0	8	8
Kaya Rabai	Kenya	0	0	0	0	8	8
Kaya Muhaka	Kenya	0	0	0	0	7	7
Marenji forest	Kenya	1	0	0	1	5	7
Boni Forest	Kenya	0	0	0	1	5	6
Kaya Gandini	Kenya	2	0	0	0	3	5
Mwache forest reserve	Kenya	0	0	0	0	5	5
Kaya Kivara	Kenya	0	0	0	0	4	4
Kaya Mtswakara	Kenya	0	0	0	0	4	4
Cha Simba	Kenya	0	0	0	0	3	3
Chale Island	Kenya	0	0	0	0	3	3
Kaya Kambe	Kenya	0	0	0	0	3	3
Kaya Kauma	Kenya	0	0	0	0	3	3
Kaya Lunguma	Kenya	0	0	0	0	3	3
Gede Ruins	Kenya	0	0	0	2	0	2
Kaya Chombo	Kenya	0	0	0	0	2	2
Kaya Chonyi	Kenya	0	0	0	0	2	2
Kaya Miungoni	Kenya	0	0	0	0	2	2
Kaya Timbwa	Kenya	0	0	0	0	2	2
Kaya Tiwi	Kenya	0	0	0	1	1	2
Kaya Ukunda	Kenya	0	0	0	0	2	2
Kaya Waa	Kenya	1	0	0	1	0	2
Lango ya Simba	Kenya	0	0	0	0	2	2
Shimoni	Kenya	0	0	0	1	1	2
Ukunda	Kenya	0	0	0	2	0	2
Dakacha Woodland	Kenya	2					2
Dodori forest	Kenya	0	0	0	1	0	1
Kaya Bombo	Kenya	0	0	0	0	1	1

Kaya Fungo	Kenya	0	0	0	0	1	1
Kaya Gonja	Kenya	0	0	0	0	1	1
Kaya Kinondo	Kenya	0	0	0	0	1	1
Kaya Mwarakaya	Kenya	0	0	0	0	1	1
Kaya Puma	Kenya	0	0	0	0	1	1
Kaya Sega	Kenya	0	0	0	0	1	1
Kaya Teleza	Kenya	0	0	0	0	1	1
Marafa	Kenya	0	0	0	0	1	1
Msambweni	Kenya	0	0	0	0	1	1
Tumbatu Island	Kenya	0	0	0	1	0	1

Coastal forests important for conserving all threatened species in coastal forests of Kenya are: Shimba Hills, Lower Tana River forests, Witu Forest Reserve, Arabuko-Sokoke Forest; Diani Forest and Kaya Ribe.

Annex 3: Threats, their manifestation and root causes to Kenyan CF Conservation

Root Cause	Manifestation	Resultant Threat
Poverty	Involvement in illegal activities Hunting and gathering of foods and other products Inappropriate agricultural practices hence low yields and need for more land	Illegal cutting of materials such as poles and fuelwood Forest clearing for cultivation Overexploitation of forest products
Poor Governance and management	Breakdown in management Inadequate operating funds No demarcation and survey of boundaries Inadequate land use planning Poor extension services Inadequate protection Inadequate participation of local communities in management Inadequate data on allowable cut and forest regulation Inadequate secure tenure Rampant corruption Inadequate monitoring No impact assessment of policies Unplanned settlement and infrastructure Land grabbing	Encroachment on forests Illegal activities rampant Unsustainable cutting Deforestation Inadequate options for alternative livelihoods
Inadequate technology, knowledge and incentives for alternative livelihoods and environmental awareness	Little opportunity to change environmentally damaging lifestyles Inappropriate agricultural practices hence low yields and need for more land Inadequate interest in conservation Inadequate alternative livelihoods options Low appreciation of consequences of biodiversity losses Weak civil societies Poor land use choices	Encroachment Illegal exploitation Deforestation Fires Overgrazing
Population growth	High demand for fuelwood timber and forest products Unplanned settlements and infrastructure Land grabbing	Illegal logging for fuelwood, poles and timber Poaching Overgrazing Overexploitation of forest products
Limited coordination and landscape focus	Piecemeal conservation efforts Short term projects Inadequate continuity in conservation	Reduced effectiveness of conservation projects Donor fatigue

	activities Inadequate coordination among different projects Inadequate coordination between conservation and development activities	
Overexploitation of forests on private land, ranches and trustlands	Increasing pressure on protected forests for forest products Ad hoc ban on exploitation Weak civil societies Land degradation	Illegal exploitation on protected forests
Increased Wildlife population (Elephants)	Habitat degradation Increased Human-Wildlife conflicts	Forest destruction Lost revenues

Annex 4: Causes of root causes as analysed in workshops organized by GEF 2002, WWF 2003 and CEPF 2003).

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

Annex 5: Major Threats to Specific Kenyan CF

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
Kitobo	Overgrazing Fires

	Inadequate management Illegal cutting Inadequate management
Mwangea Hill	Encroachment Inadequate management

Annex 6: Institutional problem analysis

Name	Capacity issues/needs
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

Annex 7: List of agencies and individuals who can be consulted for assistance in coastal forest conservation matters

Name	LOCATION	POSTAL ADDRESS	TELEPHONE	EMAIL	Contact person(s)
Government agencies					
Ministry of Environment, Natural Resources and Wildlife	Head office Maji House Nairobi	Box 49720 Nairobi	Hotline 020 2715871 Maji House 020 2716103	Asst. Minister direct, gbm@wananchi.com	Assistant Minister, Hon Wangari Maathai
National Environment Management Authority (NEMA)	Kapiti Road, Nairobi	Box 67839, Nairobi	020-609013/609027/fax 608997	dgnema@swiftkenya.com	DG: Prof. Ratemo Michieka
Public Complaints Committee	Nairobi	Box 67839, Nairobi	020-609704/609692	-	Chairman, Public Complaints Committee
Chief Conservator of Forests	Karura, Nairobi	30513 Nairobi	020-210261/3763669	ccf@wananchi.com	CCF
Director, Kenya Wildlife Service	Langata Nairobi	40241 Nairobi	02-602345	Kws@kws.org	Director:Dr Mukolwe
Forest Co-ordinator	Langata Nairobi	Box 40241 Nairobi	02-602345	Forests@kws.org	Mr H. Kabugi
Supervisor of Forests	Karura Nairobi	Box 30513 Nairobi	02-210261/215738	ccf@wananchi.com	Michael Muniu Maj-Gen Ikenye
Head, Forest Inspection and Protection Unit (FIPU)	Karura Nairobi	Box 30513 Nairobi	02-210261	ccf@wananchi.com	Michael Muniu
Tree Biotechnology Project	Karura Nairobi	64159 Nairobi	02-210261/215738	Bensonkanyi@insightkenya.com	Benson Kanyi
Kenya Forestry Research Institute	Muguga, Kiambu	Box 20412 Nairoi	066-32892/3	Kefri@arcc.or.ke	Director Dr Paul Konuche
Kenya Forestry Research Institute (Seed Centre)	Muguga Kiambu	Box 20412 Nairobi	0154-32891/32892	Kefri@arcc.or.ke	William Omondi
National Museums of Kenya	Museum Hill Nairobi	Box 40658 Nairobi			
2. Lobby and Conservation Agencies					
Nature Kenya	National Museum of Kenya, Nairobi	Box 44486 Nairobi	02-749957, 746090	eanhs@africaonline.co.ke	Director Mr Paul Matiku
Kenya Forest Working Group	Riara Lane, Nairobi	Box 20110 nairobi	02-571335	Kfwg@wananchi.org	Coordinator Michael Gachanja
Forest Action Network	Langata	Box 380	02-891035/	fan@fanwolrd.org	Director

	Road, Nairobi	Uhuru Gardens NRB.	350139		Dominic Walubengo
African Conservation Centre	Nairobi	Box 62844 Nairobi	020-891360/890 209 fax 020-891751	jmwathe@acc.or.ke	Ken Mwathe
African Wildlife Foundation	Upper Hill Nairobi			pmuruthi@awfke.org	Phillip Muruthi
Private Agencies Collaborating Together	Nairobi			irene@pactke.org	Irene Githinji
International Centre for Insect Physiology and Ecology	Kasarani, Nairobi		020-861309	igordon@icipe.org	Head Envi.Health Dr Ian Gordon
Greenbelt Movement	Nairobi	Box 67545 NBI	02-571523/ 891679	Gbm@iconnect.co.ke	Wangari Mathaai
Forest Adjacent Dwellers Association (FADA)	Arabuko Sokoke Forest	P.O BOX 1 GEDE	0122-32462	Sokoke@africaonline.co.ke	Matthias Mwavita
Kipepeo	Gede Ruins, Gede	Box 58 Gede via Malindi	042-32380	kipepeo@africaonline.co.ke	Manager Anthony Githitho
Coastal Forests Conservation Unit	Kilifi	Box 58 Gede via Malindi	042-32380	kipepeo@africaonline.co.ke	Coordinator Anthony Githitho
3. Legal centres					
Centre for Research and Education in Environmental Law(CREEL)	University of Nairobi	45801 GPO Nairobi	02-375165/ 313228	Creel@etouch.africaonline.com Creel9@hotmail.com	George Wamukoya
Kituo Cha Sheria	Nairobi	7483-00300 Nairobi	02-565780/ 565781	Hakinafasi@iconnect.co.ke	Harun Ndubi

Annex 8: Some Key Coastal Forest products trading organizations (Mbuvi, 2004)

Project/year started	Trade activities involved	Products	Clients/Customers	Trend over 10 years	Form of authorization	Opportunities and Challenges
Kipepeo	• Butterfly pupae sales • Butterfly research • Honey sales • Dried moth	• Pupae. • Publications. • Honey/wax	• Butterfly farms. • Research institutes. • Zoos • Public honey	• Increased sales against a set ceiling of what can be bought.	• A letter authorizing the trial from KWS	• Limited markets. • Income in short period. • Growing industry abroad. • Venturing into other markets.
Bioken/ 1980	• Snake exhibition • Snake handling training. • Awareness creation • Venom marketing • Hotel snake shows •	• Snakes • Venom. • Rescued bush babies, duikers and orphaned antelopes	• Tourists, Researchers and schools children • Local communities	• 1994-1999 good, 2000 – 2003 bad and 2003 to date worse because venom production has gone high but markets are reliable	• No formal license but KSPCA of animals laws apply including CITES	• Government controls on wildlife trade. • Paying for work permits • Financial constraints • Mushrooming snake farms • Diversification to tortoise, Monitor lizard, crocodiles and snake shows in hotels.\venturing to international markets for tourists and venom. • Participate in the training of health workers on snake issues in future.
Falconry	• Breeding birds of prey like Buzzards, owls kites vultures etc. • Rescue Centre for monkeys and bush babies	• Snakes, Tortoise, Monkeys, Baboons and squirrel.	• Tourists; 8 years ago good (400 visitors per month) 2 years ago bad (200 visitors per month). • They have 40 birds from initial 5.	• Charges non-residents 250/= o 150/= while residents pay 100/= to 50/= per person.	• Policy not clear and KWS has al lot of restrictions	• Competition from other farms. • Not allowed to sale newborn birds but release them in suitable habitats. • Health Risk by interacting with domestic animals like chicken
Baobab Farm Bamburi started in 1971	• Quarry rehabilitation • Snake farm • Aviculture • Game farming of Oryx, Elands, Buffaloes like Hippopotamus, Ostrich, Dik diks etc. • Butterfly exhibits	• Crocodile skin (in the past) • Fish sale. • Crocodile meat. • Timber and firewood • Antelope meat. • Ornamental	• Hotels, construction industry and residents. • Tourists in 2003 about 100,000 visitors	• 1994 to 2001 sold an average of 30,000 seedlings per month • 2002 to 2004 selling 4000 seedlings per month • Production scaled down because of less demand because of mushrooming private nurseries		• EMCA is positive on mining. • Diversification to specialized tourism like bird watching ad activity tourism –constructing a school or planting trees. • Utilization policy not clear • Forest products use ban affecting trade.

		plant		• Lack of seeds • Lack of expertise • Theft of timber and lenient punishment systems?		