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A SOCIO-ECONOMIC REVIEW OF COASTAL FORESTS IN TANZANIA

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1.0 INTRODUCTION

The forestry sector has a very important role to play in Tanzania's economy. Although in absolute terms, its contribution to total Gross Domestic Product (GDP) is low it has increased considerably during the past 10 years by about 35 per cent, from 2.6 to 3.4 per cent of GDP (URT, 2000).

Covering 37.8 per cent of the total landmass, which is about 33.5 million hectares, the country's forests contain such a high level of biologically diverse resources that Tanzania is one of the richest countries in terms of biodiversity in the world and among the 12 most diverse countries.

Tanzania has Africa's largest number of mammals, second largest number of plants (10,000 species), third largest number of birds (1,035 species), fourth largest number of amphibians (123 species) and fourth largest number of reptiles (245 species), all harboured by the country's forests. In addition, the forests provide over 92 per cent of the energy resources, support the development of other important sectors (such as agriculture and tourism) through provision of water resources and catchments, maintain hydrological balance and soil protection, recycle atmospheric gases, provide construction materials, employment sources and others (Burgess et al 2003).

Tanzanian coastal forests are recognized globally as major centers of both species diversity and endemism. There are represented by a few remaining patches of reserves and unreserved forests. These forests harbour a unique diverse of flora and fauna which show endemism. Based on Burgess and Clarke (2000) Tanzania coastal forests are rich in species that have national socio-economic values and are highly prioritized by the Forest Department through the Tanzania Forest Action Plan (TFAP, 1988) for conservation due to their values. However, despite their values, coastal forests are rapidly being destroyed. Some of the direct threats include charcoal production, logging, grazing and expansion of agricultural land.

This study reviews the socio-economic and cultural values of coastal forests at local, national, regional and international level. The focus is on economic value, medicinal value, biodiversity value, spiritual value, environmental values, etc.

The study starts by reviewing the coastal forests including description of coastal forests, the importance of coastal forests, biodiversity hotspot and values, socio-economic values, roles/stakes of stakeholders in coastal forests conversation and management, main challenges and threats to conservation and sustainable management of national coastal forests at local, national and global levels.

Finally, this study identifies main issues/constraints and articulates the information to be included into the EACFE programme planning documents.

2. DESCRIPTION OF COASTAL FORESTS

2.1 DEFINITION OF THE COASTAL FORESTS

The Coastal forests are a mosaic of vegetation types including evergreen forest, brachystegia woodland, scrub forest and dry forest along the coastal belt of Tanzania. They are distinct from the forests of the Eastern Arc Mountains and do not include mangroves. The coastal forests are broadly synonymous with the forests of Zanzibar – Inhambane region mosaic, but still provide a wide spectrum of opinions about their geographical distribution, their biological affinities, and the main vegetation formation type of which they belong (Hawthorne, 1993; and Levtt, 1992 and 1993).

2.2 DESCRIPTION OF COASTAL FORESTS

Scrub Forests – Developed on rocky (usually on coral rag) are treated collectively as mixed scrub forests and predominately found in Southern Tanzania particularly in Makonde Plateau. The scrub forest patches are often surrounded by a fire barrier of scrubs/small trees e.g. of *Acacia brevispica* which protect other Pyrophobic species in these thickets/scrub forests.

Marine Scrub Forests – These are scrub forests developed on coral rag (surface limestone derived from recent corals) is found at intervals along the coast of Tanzania. The associated soils tend to be shallow and so are more prone to desiccation than would be expected given the mean annual rainfall of 800 – 2000 mm. The canopy of these forests is typically 6-10 m high with little vertical stratification and has occasional emergent 8-15 m tall (which are associated with pockets of deeper soil). Maritime scrub forest plants often have extremely thick coriaceous leaves to withstand the severe desiccation effect of the strong salt-laden sea breezes. Few species such as *Spirostachys venenifera* have been recorded on coral rag near Mikindani in Southern Tanzania. On the Island of Pemba and Mafia there is unusual form of maritime scrub forest on sandy soils with large emergent trees over dense canopy formed by the giant health bush *Phillipia mafiensis*.

Afromontane Transitional Forests – These forests are found in areas of higher rainfall (typically over 1,500 mm at the high base of the Eastern Arc Mountains) vegetation closer in physiognomy to lowland rain forest may develop. Most of such areas in coastal Tanzania are on higher locations, particularly where drainage is additionally impeded e.g. on the Tongwe and Tong'omba (Matumbi Hills) in Tanzania and in the foothills of the Eastern Arc Mountains e.g. the East Usambaras, Ulugulus, and Udzungwas. The most frequently encountered dominant tree species include *Antiaris toxicaria, Bombax rhodognaphalon, Dialium holtzii, Drypetes natalensis, Ficus spp, Khaya anthotheca, Milicia excelsa, Newtonia buchananii, Parkia filicoidea, Pouteria pseudoracemosa, Sorindeia madagascariensis, Sterculia appendiculata and Zahna golungensis*. These species include widespread trees associated with riverrine and groundwater forests as well as those associated with submontane forest.

Riverrine/Swamp/Ground water forests – Riverrine and groundwater forests are difficult to be separated. The most frequently encountered species are *Antidesma venosum, Baringtonia racemosa, Bridelia micrantha, Burrdavya myassica, Celtis phillipensia, Cardia goetzei, Diospyros mespiliformis, Ficus scassellattii, Ficus sycomonus, Garcinia livinstonei, Khaya anthotheca, Sorindeia madagascariensis, Sterculia appendiculata, Synsepalum brevipes, Syzygium guineense, Terminalia samsesiaca and Trinchilia emetica*.

Riverrine Forests – These forests are important for herbs. They develop along the course of permanent or near permanent watercourses and is characterized by the scattered occurrence of large trees which may also be found along watercourses far beyond the coast forest belt. Permanent watercourses may

provide a less favourable habitat for the moist forest herbs i.e. *Saintpaulia spp* and *Impatiens walleriana* together with epiphytic orchids on the trees. Since permanent rivers in Tanzania strongly seasonal climate will be too wide during the rainy season a closed canopy above the water and to thereby retain the humid air evaporating off the water surface.

Swamp Forests – These forests are important for boat building. These forests are found in freshwater swamp conditions are rather rare in the coastal forest belt with only 22 tree species recorded in the literature to be dominant/common in the vegetation type. As elsewhere in Africa, swamp forest is vegetatively distinct from other forest types with many of these containing very distinctive areas of monocotyledon – dominated forest e.g. both Jozani Forest, Zanzibar and Kimboza Forest, Tanzania contain monodominant stands of *Pandamus rabaiensis*, smaller areas of such forest are present elsewhere in Tanzania such as Kazimzumbwi and Pangani falls. Monocotyledonous trees are predominant in other areas of coastal swamp forest e.g. the palms *Raphia farinifera* and *Elaeis guineensis* in Coastal Pemba, Zanzibar and Mafia Islands and the aroid *Typhonodorum lindleyanum* in some areas of swamp forest on Pemba Island. The dicotyledon *Barringtonia racemosa* is a frequent constituent of swamp forest in Tanzania.

Groundwater Forests – These are in most cases valued timber species, there are forests with undulating or dissected topography, seasonal and permanent drainage courses, which are moisten than surrounding slopes and ridge tops since the collection of both surface and groundwater provides an additional moisture supply. The forest canopy is typically 25-35 meter tall and many of the trees have larger and less desiccation adapted leaves than found in other coastal forest vegetation types. The Moraceae family e.g. Antiaris, Ficus, Milicia, Trilepesium is prominent and these are many than other species associated with groundwater forests are dispersed by birds and bats.

2.3 THE IMPORTANCE OF COASTAL FORESTS

The Coastal forests are important because of the many and varied uses. People use coastal forests for medicinal plants, fuelwood, building materials, food and help to maintain a regular water supply for towns and villages and for cultural scenery. Coastal forests are globally important because of the plant and animal species they maintain. Many of the plant and animal species found in the coastal are found nowhere in the world. They are endemic. In Tanzania, the coastal forests extend east to the island of Pemba, Ugunja and Mafia and west to the base of the Eastern Arc Mountains. Coastal forests are found from sea level to a maximum of 1100m attitudes depending on ecological conditions.

2.3.1 Biodiversity Hotspot

The biodiversity hotspot of Tanzania Coastal Forests (TCF) is a mosaic, which stretches from the boarder of Tanzania with Kenya to the boarder of Tanzania with Mozambique including the Islands of Zanzibar, Mafia, and Pemba (See Map - Annex I). The TCF occur up to 1040m and rainfall ranges between 2000mm/year (Pemba) to 500mm/year (Southern Tanzania). There are two rainy seasons long (April – June) and short (November – December) in the North but only one in the South (April – June). Dry seasons can be severe and rainy seasons can be accompanied with *El Nino* effects (Burges et al, 2000; and Clarke 2000). By the early 1990s, there were about 66 forest patches in the Coastal Forest Mosaic in Tanzania covering an area of 700 sq.km with mean patches size 10.6 sq.km and modal patches size classes 5-15 sq.km. Generally, there are no Coastal forest in Tanzania larger than 40Sq.Km (WWF-US 2003b).

The biodiversity hotspot has been designated as a *hotspot* by Conservation International and is one of WWF's *Global 200* priority ecoregions. The hotspot is believed to contain at least 1,500 endemic plant

species, 16 endemic mammals, 22 endemic birds, 50 endemic reptiles and 33 endemic amphibians (Lovett & Wasser, 1993; Burgess *et al*. 1998; Burgess & Clarke 2000; Myers *et al*. 2000). The 2002 IUCN Red List identifies 333 species as either critically endangered, endangered, or threatened in the hotspot. Twenty out of twenty-one African Violets found in the Eastern Arc Mountains are endemic.

The forests are highly important for the livelihood and well being of many Tanzanians. The Uluguru Mountains, for example, provide Dar es Salaam with its main water source. The forests also generate a significant percentage of Tanzania's electricity through hydroelectric power plants. Even though many Eastern Arc Forests are now experiencing unsustainable resource use practices, traditionally, the forests provided timber and related products for local communities. These same local communities retain a wealth of indigenous knowledge about the flora and fauna that has been poorly documented and is in risk of being lost forever.

Today, the Eastern Arc Forests are under severe threat. The main threats are: commercial agriculture, subsistence agriculture, commercial timber extraction, domestic timber extraction, intentional fires, and household use (GEF 2002). As Tanzania's population continues to grow, the pressures on the forests will become even more significant. Since Tanzania Forests Conservation Group's (TFCG's) beginning in 1985, it has been actively involved with communities and government to increase awareness and protection of these vital forests. In the 1980s, TFCG successfully campaigned for the first Eastern Arc National Park in Tanzania, the Udzungwa Mountains National Park.

During the 1990s, TFCG began to establish a network of field-based projects in the Eastern Arc. These projects worked with the forest-close communities to raise awareness about forest conservation, develop strategies and improve livelihoods. In 1998 Tanzania adopted a new National Forest Policy. The 1998 National Forest Policy empowers communities to manage forests on village land. Since the passing of this policy TFCG has taken a leading role in developing and testing the implementation of participatory forest management in Tanzania.

2.3.2 Biodiversity Values

Biological importance of coast forests can be explained in terms of endemic species. The emphasis is on Red Lists of threatened species that occur in the hotspot. The Global biodiversity values of the hotspot are widely recognized. The hotspot is the home of at least 1,500 endemic plant species, 16 endemic mammals, 22 endemic birds, 50 endemic reptiles, and 33 endemic amphibians (Ecosystem Profile, 2003).

The coastal forests are of biodiversity importance of Zanzibar – Inhambane regional mosaic/Swahilian region *Sensu lato*, which extend to some 3,172 sq.km. The forests contain 70% of the regions endemic plant species and 91% of its endemic genera. The endemic coastal forest plant species are predominantly woody; 58% of all Zanzibar – Inhambane/Swahilian region *Sensu lato*/coastal forest belt endemic species and 69% of all the endemic genera are woody. 30% of the endemic species and 53% of the endemic genera are trees (36% of the forest dependent species), which are considered to represent more ancient endemics compared to shrubs and herbs, hitch is considered to be more recent origin. Lianes (Woody) and Climbers (Non Woody) account for 4.2% and 10.7% of all coastal forest belt regional endemic plant species and are well represented by the Asclepiadaceae (which account for 15.1% of the endemic species), Cucurbitaceae (11.9) and Vitaeae (11.4%), 17% of the forest dependent species are Cimbers or Lanes. Herbs account for 26.4% of the coastal forest belt endemic species (24.6% species which are also recorded as shrubs and/or climbers are extended) but account for only 17.6% of the endemic genera. The endemic herbs are well represented by the Acanthaceae (comprising 13.8% of the endemic herb species), Papilionoideae (9.4%), Rubiaceae (5.8%), Araceae (5.5%), Asteraceae,

Euphorbiaceae and Lythraceae (4.6% each), Liliaceae (4.0%), Commelinaceae (3.6%) and Amaranthaceae (3.3%), 2.7% of the endemic herbs are recorded as being forest dependent, which account for 17% of the forest dependent endemic species (Burges and Clarke, 2000).

Grasses and Sedges – account for 26.9% and 17.2% respectively of the coastal forest belt endemic flora and include two endemic grass genera.

Birds – The Tanzania coastal forests contain a number of unique bird species that make their avifauna distinct from that of other forest types in the region. Five species fall under endemic species i.e. Sokoke Pipit *Anthus sokokensis* is relatively widespread in the coastal forests of Tanzania but with a patchy and apparently relict distribution. The little Yellow *Flycatcher erythrocercus* holochrus is widespread north of the Rufiji River; Reichernow's Batis *Batis reichenowi* is restricted to forests South of the river. The Pemba scops owl *Otus pembaensis*, Pemba Green Pigeon *Trerron pembaensis*, Pemba White – eye *Zosterops vaugnani* and Pemba Sunbird *Neetarinia pembaensis* are restricted to Pemba Island. Today they are not tied to forest, although they have evolved as forest dependent birds (ibid).

Some species are endemic or very nearly endemic to the Zanzibar – Inhambane regional mosaic/Swahilian region *Sensu lato*. These comprise the Malindi Pipit *Anthus melindane*, Scaly Babber *Turdoides squamulatus*, Tana River Cisticola *Cisticola restrictus*; Violet breasted sunbird *Nectarinia chalcomelas*, Lesser Seed Cracker Pyrenestes minor and Mouse-coloured sunbird *Nectarinia veroxii*. They do not occur in forest, being birds of grassland, busgland and thicket. Pemba and Zanzibar have several endemic sub-species such as Dark-backed Weaver.

3.0 REVIEW OF SOCIO-ECONOMIC VALUES OF COASTAL FORESTS

The GEZA EACFE Action Programme and the EAME Strategic Framework 2004 – 2024 did not very much articulate socio-economic value of coastal forests in Tanzania. However, various studies indicates, the socio-economic values of coastal forests including study by Richmond et al (2002), Malimbwi, R.E (2000), Kaale et at (2000), Hogan, A. R (2000) and Durand J (2003) highlighted various socio-economic values of coastal forests with the case of Rufiji Districts. These studies indicated that, numerous forest resources are harvested and processed in the Coastal areas and a high proportion of households are involved in many of these activities. Grasses, sedges and reeds are used by many households for making fences, mats, chicken coops, grain storage containers and in house construction, but in small quantities. Palms are an important resource in the Coastal areas and the lala palm *(Milala)* and wild date palm (*Ukindu*) are particularly important. Their leaves used for making sleeping bags, mats, drying mats, baskets, bed ropes, hats, food covers, fans, ornaments, brooms and grain silos. *Ukindu* leaves are superior for this purpose, and are dyed to make multi-colored products, but they are mainly restricted to the delta area.

A high proportion of households harvest food and medicinal plants for home consumption. A study by Kitula (2001) indicated that the medicinal values of coastal forests in Bagamoyo District. Also, poles of a variety of thickness are cut from both forests and mangroves, both for use in construction and, especially in the case of mangrove poles, for export from the coastal districts to major urban centers.

Similarly, timber cutting, a major commercial activity in the woodland areas, is a regulated activity, which is largely controlled by businessmen from major urban centers who sometimes employ locals or buy from local pitsawers. As with pole cutting, the activity is fuelled by high demands from Dar es Salaam and other centers.

The most valuable species, *Pterocarpus angolensis* is already scarce due to overexploitation, and the highest demand is now for its substitute, *Afzelia quanzensis* several other species are also cut for timber.

3.1 TIMBER

Timber cutting is a commercial activity in the Coastal area and is mainly driven by large demand from Coastal Urban Centers of Dar es Salaam, Zanzibar and other town centers. Increasingly scarcity of the preferred hardwood species *pterocarpus angolensis* has led to an increase in its price in the market centers. As a result, it is being substituted in furniture making by other hardwood species including *Afzelia quanzensis*. The ongoing depletion of preferred species near the village surroundings coast forests has forced people to look for these species in the protected areas and this hinder the conservation efforts (Mwamfupe, 1997). Much wood has been extracted and transported to the major marketing centers in a form of semi-finished furniture (Table 1). This has been possibly due to either as a response to tightening wood rot transportation regulations or materials and labour are cheaper at source than at market centers. Furthermore, logging is a commercial activity by local residents residing in the villages surrounding the forest reserves. Since logging done on a commercial scale has a potentially damaging effect by removing the young canopy trees.

Table 1: Woodland tree extracted for timber and other uses, based on group discussion data.

Local Name	Species*	Use Value	Village and Comments
	Ptecocarpus angolensis	(Furniture)	It is restricted to be cut unless permitted by Village Government/District Natural Resource Officer – This is according to village by-laws
Mtundu			Top two hard wood species in the study
	Milicia excelsa		Don't cut much
Mkangazi	*Khaya anthoteca*		Cut rarely
Mkongo	*Afzelia quanzensis*	Furniture	75% of timber cut substitute to Mninga.
Mpangala	Dichrostachys cinerea	Firewood	Mostly used
		Furniture	Ranked 3rd
	Hagenis sbyssinica		Cut rampantly

*Sources of names are from Malimbwi (2000)

3.2 FIREWOOD

Firewood is either collected from the forest reserve or around the reserve. Women generally collect firewood although men occasionally assist in this especially during big and important occasions.

There is some trade in firewood especially for communities along the major track road (Mtwara -Dar es Salaam) with the main buyers being small traders from towns along the track road. However, in most cases firewood is for home use and brick making in some settlements in Coast areas. It is estimated that over 5 million bundles of firewood are harvested yearly in the coastal areas with the market value of almost USD $ 750,000. Most of this is for subsistence use, with a very small proportion of the value realized in the form of cash income (Richmond et. al 2002 and Kaale et. al 2000).

3.3 CHARCOAL

Charcoal is made in kilns in the forest in all the coastal areas. It is marketed and used mostly in urban areas. There are types of wood preferable for charcoal making but due to high demand, any tree of any sizes from branches to large trees are used.

Charcoal is always made for commercial purposes, legally this activity requires license which villagers are reluctant to obtain. Much of the activity is therefore done illegally, hence estimation of values become difficulty. However, the findings indicate that, a bag of charcoal costs up to Tshs. 5,000/= in Dar es Salaam and a causal estimate is that, at least 300 bags of charcoal leave the forest daily, which suggests a total production of in excess of 9,000 bags per month, although this may come from anywhere in the entire Coastal areas (Kaale et.al, 2000).

Nevertheless, the intensity of charcoal making changes seasonally. It is made all the year around, but production increases dramatically during dry season and famine time. The study indicated that, local people have only limited role in the production, because external businessmen control the production (ibid).

3.4 POLES

Poles of various variety of thickness are cut from coastal forests reserve mainly for use in house construction. Most houses in the Coastal Villages are built with poles and most household use poles for their own requirements and not for sale. In the some coastal area, much pole cutting is done illegally. However, popular species for building materials are *Grewia bicolor, Julbernadia globifola* and Bamboo. Also important is thatching which may be collected from the wooded areas.

Based on needs for house and stilt-house construction, this construction would require about 1.5 million poles in all the coastal areas (the true value requires a detailed household survey).

Natural forests in the coastal areas are estimated to have an economic direct use value of $10.3 million per year. The total net financial value (net value to households in terms of home consumption and cash income) of natural resource use is estimated to be $9.2 million, or $575 per household per year, of which a large proportion is realized as cash income. Over 70% of this value is attributable to the area's fisheries (Turpie, 1999).

3.5 WILD ANIMALS AND BIRDS

3.5.1 Wild Animals

Coastal forests contribute indirectly to hunting activity as forests support wild animals and are carried out throughout the coastal area. In Rufiji about 265 – 370 'professional' hunters with guns who supply the villages but also by youths who target smaller species with traps and catapults. Hunting is generally unselective, with over 17 species of mammals and 26 types of birds being hunted, although certain species such as impala and buffalo are preferred. Hunting requires a license, but control is weak and most hunting is probably illegal. An estimated 160 tons of game and 51,000 birds are hunted annually. Sport hunting is negligible absent within the Rufiji District, although it is carried out in hunting areas nearby.

Wild animals depend on forest resources and are endowed with different wild animal species in game reserves due to its diversity importance. The significant animal species include: Topi, Impala, Zebra, Warthog, Sables, Giraffe, Lion, Leopards, Hartebeests, Elephants, Bushbucks, Crocodiles, Wild dogs, Dikdik, Reedbucks, Duikers, Oribi, Roan Antelopes, Great Kudu, Jackals, Ostrich, and other different species of water loving birds, elephants (*Loxodonta Africana*) as is illustrated in Appendix 1 of CITES (Convention on International Trade in Endangered Species of wild fauna and flora) while lion (*Panthera leo*) and Nile Crocodile (*Crocodylus niloticus*) are listed in CITES Appendix II. Such species which are listed in CITES Appendices raise the national and international conservation concern.

3.5.2 Birds

Birds are of particular interest in the coastal areas hence the area has been declared by Bird Life International and Wildlife Conservation Society of Tanzania (WCST) as one of Tanzania's Important Bird Area (IBA). This area harbours endemic bird species whose distribution in Tanzania is very limited. Some bird species in the area are near to be threatened or vulnerable due to habitat (loss) – the Pallid Harrier, Black – winged praticole, Great Snipe, Basra Reed Warbler, Lesser Kestral, and Wattled Crane. The coastal area is also thought to contain significant percentages of the populations of a number of other species. It also contains a number of birds whose distribution in Tanzania is very limited – the White –throated Swallow, Yellow –crowned Crane, Wattled Crane, Denham's Butrad, and Saker Falcon.

3.6 BEE KEEPING

The beekeeping sector plays a major role in socio-economic development and environmental conservation. Beekeeping is a source of food (honey, pollen and brood), raw material for various industries (bee wax candles, cosmetics, textiles, lubricants etc.), medicine, and income for beekeepers. According to 1998/99 to 2002/2003 export data, beekeeping in Tanzania generates an average of 1.7 million USD annually from sales of honey and beewax. Bees also provide pollination to both cultivated and natural plants. It is also estimated that beekeeping activities provide employment to about 2 million people.

Hives are kept throughout most of the coastal area especially Rufiji and Bagamoyo and are used both for the **production of honey** and for providing a pollination service to fruit farmers.

In Rufiji alone, hives yield 60 to 80kg of honey per year, which fetches a wholesale price of Tshs. 1,000 – 1,200/kg, and retails at approximately Tshs. 2,000 – 3,000/kg. Thus, based on the estimated total number of hives for the coastal area, the total wholesale value of honey is Tshs. 9.6 million, and the retail value is Tshs. 24 million per annum. The production of honey and beewax in the coastal forests especially in Rufiji has significant value to household income.

3.7 BAMBOO, SEDGES AND GRASSES

3.7.1 Bamboo

Two important products are made from bamboo tree- large carrying baskets (*tenga*), used for fish and agricultural products and winnowing baskets. *Tenga* and winnowing baskets are sold at Tshs. 1,000/= and 1,500/= respectively in coastal towns. Men make these in almost everywhere in the coastal villages. Most households own these products, but most of the production appears to be outside the coastal area and value for production within the coastal areas have not been estimated.

3.7.2 Sedges

Sedges are notably abundant in the coastal areas **(Photo)**. This is an important and rare resource found mainly in the coast belt and is used to produce mats and various other products (Turpie at al. 1999). People in the coastal area particularly in Rufiji reported to be collecting sedges for mat making and ceiling construction. In Rufiji alone, a total of 1,500 bundles estimated to be harvested annually with a gross financial value of $ 150, all of which realized as subsistence value.

Photo: Women collecting sedges for mat making and ceiling construction in Rufiji Flood Plain

3.7.3 Grasses

Grasses are abundant throughout the coastal areas. Grasses are harvested by every village household in the coast and are used in some villages to make fences or hedges and source of raw materials for roofing of their houses. In Rufiji and Bagamoyo, grass is harvested in 50cm bundles, and very rarely sold for Tshs. 200 – 500 per bundle. Grasses are available close to or in the villages and it takes under 1.5 km to find and collect a bundle. About 50,000 bundles of grass are harvested annually, mostly from the flood plains. This harvesting is estimated to be worth just over $ 5,000 per year but is almost entire a subsistence value.

3.8 FISHING

Fishing is another economic activity that utilizes coastal forests and is highly important activity in the coastal area, both in freshwater systems and in the estuarine-marine systems of the delta. Most freshwater fishing takes place in the numerous permanent lakes of the floodplain, which provide breeding habitat for fish and are replenished in most years by floods. In the delta fishing is in estuaries and in the shallow inshore waters along the coast. The majority of fishers use nets, a relatively recent phenomenon, although traditional traps and hooks are also still commonly used. Women use fine-meshed nets in the delta. In Rufiji, the freshwater fishery is very unselective in terms of both species composition and size: over 40 freshwater fishes occur in the floodplain system, and over 30 species were named in this study as being caught. It is, however, dominated by the most common species, notably the cichlid fish *Oreochromis urolepis* ('Tilapia'), catfishes (Clarias, Schilbe, Bagrus) and Alestes. A further 30 marine species were named in this study, and several other marine species are also known to be caught in the delta.

The most important fish in the delta are dagaa (a general term for several small small fishes such as mullet) and mbarata (clupeid fish such as Hilsa kelee). Prawns (*Metapenaeus monocerus, Penaeus monodon,* and especially *Peneaus indicus*) are the most valuable fishery in the delta, and form a large proportion of catches in this area. A study on "Analysis of Smallholder Opportunities in Fisheries, Coastal and Related Enterprises in Flood Plain and Delta Areas of the Rufiji River" (REMP Technical Report No. 25, 2002) indicated that, fisheries provide the greatest contribution to incomes and that prawn production accounting for 80% of the national industrial catches. Furthermore, the study indicates that, smoking of fish is done using simple table kilns often open at all sides. The smoking process takes 3-6 hours depending upon size and species of fish and the atmospheric conditions. Thicker fatty fish such as larger catfish may require up to 2-3 days on intermittent smoking in traditional smoking kiln.

Within the floodplain, fishing is year round, but with a strong seasonal change in effort corresponding to periods of flooding. In the delta, fishing is year round, with less of a marked seasonal change in catches, as fishers tend to track the changes in availability of prawns along the coast. The total finfish catch is estimated to be about 9,000 tons per year, with freshwater fish making up about 5,500 tons, within the estimated sustainable yield of the floodplain area. The artisanal prawn fishery catches in the order of 2,200 tons per year. In addition, at least 113 tons of shrimps and 34 tons of crabs are caught.

3.9 FARMING

In the coastal areas of Tanzania farming is considered to be the primary economic activity. With an average field size of 0.77 – 1.2 ha and different types of crops are grown, with rice, maize, sweet potatoes, millet, vegetables and fruits are grown largely for subsistence, but with a proportion being sold for cash fruits are grown largely for subsistence, but with a proportion being sold for cash income.

In addition, crops such as cashew nut, sesame and coconuts are grown primarily for cash income. In Rufiji District, crop production is estimated to have a gross market value of $3.8 million annually, with a net economic value of about $2.6 million. Grains, especially rice, make up over half of this value, and cash crops less than 10%. A large proportion of households also keep livestock, mostly fowl, but also goats and cattle to a very limited extent, the latter only being found in the delta. These activities have a total gross value of $784,000.

4.0 ROLES/STAKES OF STAKEHOLDERS IN COASTAL FORESTS CONSERVATION AND SUSTAINABLE MANAGEMENT

4.1 GOVERNMENT INSTITUTIONS

In Tanzania, the institutional set up is largely an inheritance from the colonial governments. There is a Civil Service structure that includes ministries, permanent secretaries and national institutions (divisions, departments) dealing with different sectors of society and the economy. In Tanzania the Ministry of Natural Resources and Tourism (MNRT) Oversees Four Divisions: - Wildlife (WD), Forest and Beekeeping (FBD), Fisheries, and Tourism. The Ministry supervises three Parastatal wildlife organizations including Tanzania National Parks Authority (TANAPA) Tanzania Forrest Research Institute (TAFORI) and the Tanzania Wildlife Research Institute (TAWIRI). An important function of TAWIRI is to issue research permits for all ecological and biological fieldwork in the country. In Zanzibar Department of Commercial Crops, Fruits and Forestry (DCCFF), under the Ministry of Agriculture, Lands and Natural Resources, administers forest resources and the area proposed to become the Jozani-Chwaka Bay National Park. Research permits to work in Zanzibar and Pemba have to go through the Zanzaibar authorities.

4.1.1 Government Departments

The FBD is responsible for the protection of forests and the productive use of forestlands to meet demands for wood products. Until recently, protection focused on watersheds rather than biodiversity and production involved harvesting of indigenous hardwoods and the establishment of industrial plantations of pine and cypress. Now there is official recognition of the biodiversity values of the indigenous forest reserves within FBD and the harvesting of indigenous hardwoods has been banned in conservation areas, including the Eastern Arc and Coastal Forests. The Government Catchment's Forests (mainly in the Uluguru and East Usambara Mountains) and the nature reserves have remained under government control, administered by an FBD staff of eight forest officers and 57 assistant forest officers (GEF 2002). The National policy on decentralization has put the most of the remaining forests under the management of the District Authority. There are at least six categories of management status:

Forest Reserves, Local Authority Forest Reserves, Monuments, village Forest Reserves, Private Forest Reserves and Public Lands/Public Forest (WWF-EARPO 2002b)

There are three additional management categories in the Eastern Arch Mountains, which are outside the FBD/District level framework for forests: National Parks, Game Reserves and Nature Reserves. There are two national parks (Udzungwa Mountains National Park and Mikumi National Park) managed by the Tanzania National Park Authority based in Arusha. There are two game reserves (Selous and Mkomazi) and one nature reserve (Amani) managed by the Wildlife Division and the Tanzania Wildlife Research Institute (TAWIRI). Nature Reserves enjoy a higher level of protection than Forest Reserves.

A number of problems have been identified with the administrative framework of FBD, some of which are exacerbated by the decentralized structure for forest management in Tanzania (GEF 2002). These include:

- Emphasis on regulation and enforcement rather than on service delivery;
- Weak oversight on forest management, poor accountability and supervision.
- Ineffective fiscal procedures in terms of meeting objectives and delivering services;
- Poor revenue collection;
- No institutional mechanisms for biodiversity conservation;
- No scope for the public financing of biodiversity conservation;
- No institutional recognition of the needs of local communities; and
- Diverse and complex tenure systems.

These and other institutional problems are being addressed by major reforms in the Tanzanian forest sector. A proposed $62.2 million dollar project (Forest Conservation and Management Project) funded by GEF, World Bank and the IDA would implement the reforms. A major output of this project would be the establishment of the Tanzania Forest Service (TFS), which would be responsible for the implementation of the National Forest Programme (see below).

4.2 NON GOVERNMENTAL ORGANIZATIONS (NGOS)

Tanzania has a plethora of Non Governmental Organizations that deal with environmental and conservation issues. Many of them have been or are involved in forestry-related activities in the hotspot.

Their interventions have complemented on going government conservation and development initiatives in the hotspot and have greatly assisted the FBD during periods when donor funding was difficult to get for government departments.

NGOs can provide significant complementarities to government institutions,

- They are able to speak out without adhering to government policies and to lobby the government on environmental policies and to lobby the government on environmental policies and decisions.
- They have demonstrated accountability to donors because they need to be accountable to survive.
- They can quickly raise and access funding, take decisions and act in response to emergencies or changing or changing circumstances.
- They are often closer to the grassroots and have a stronger relationship with communities.
- Their members are often motivated by strong convictions and are therefore highly committed.
- They are increasingly part of a supportive international network, which can quickly share knowledge and experience on environmental issues and which has a global voice.

They have one fundamental disadvantage: they do not have the national mandates to manage forests and wildlife areas and whole they can contribute to part, forest or wildlife management they do not have ultimate authority. This means that their ability to solve problems on the ground in forest reserves or national parks is limited. NGO project management is often challenging and it requires technical, managerial, political and interpersonal skills. High turnover in project managers is not uncommon.

4.2.1 International NGOs

International NGOs that work in environmental and conservation activities in Tanzania include Africa Wildlife Foundation (AWF), African Conservation Center (ACC), Bird life International, CARE International and CARE Tanzania, Environmental Liaison Center, International, Friends of Conservation (FoC), the IUCN Dar es Salaam Office and East Africa Regional Office (IUCN-EARPO, TRAFFIC, WWF-TPO and WWF-EARPO. Bird life International and CARE International are global organizations with region and national offices in Dar es Salaam. AWF, ACC and FoC operate throughout Africa, but are linked with parent institutions abroad. All of these well-known organizations have carried out significant activities within the hotspot. WWF-EARPO is spearheading the Eastern Africa Coastal Forest Programme in Kenya, Tanzania and Mozambique.

The East African Wild Life Society (EAWLS) and the East Africa Natural History Society (EANHS) operate only in East Africa, although their membership is international.

4.2.2 National NGOs

National NGOs in Tanzania include TFCG; Frontier-Tanzania; Journalist Environmental Association of Tanzania (JET); the Lawyers Environmental Association of Tanzania (LEAT); Rural Development and Environmental Conservation Trust (RUDECT), Envirocare, and Wildlife Conservation Society of Tanzania (WCST) and many others. The TFCG has a considerable track record of conservation initiatives on the Tanzanian side of the hotspot, particularly in working with local communities and in participatory forest management. Frontier-Tanzania has been responsible for much of the scientific research in the Eastern Arc Mountains, working together with the University of Dar es salaam and visiting scientists. JET is invaluable in awareness raising and advocacy. The WCST is the Bird life national partner for Tanzania and had produced the Tanzanian IBA Book (Barker & Barker, 2002). LEAT provides important legal support on conservation issues in Tanzania. RUDECT is linking rural development and environmental conservation in Tanzania while Envirocare is dealing with human rights, gender and environmental issues.

4.2.3Community Based Organizations

Among the Community-Based Organizations (CBOs) are the Arabuko-Sokoine Forest-Adjacent Dwellers Association; the Arabuko-Sokoke Forest Guides Association; and the Shimba Hills support Group. In Tanzania these organizations include the Korogwe Development Environmental protection Association/ Morogoro Environmental Conservational Action Group, Siginda River Conservation Society-Tanga and Usambara Environment Conservation Organization-Lushoto. Many of these are relatively new and need testing and capacity building, but they have the virtues of being on-site and being rooted mostly in the local communities, where support is badly needed.

5.0 MAIN CHALLENGES AND THREATS TO CONSERVATION AND SUSTAINABLE MANAGEMENT OF NATIONAL COASTAL FORESTS

The GEZA EACFE identified various threats to biodiversity loss resulting from expanding agriculture, charcoal burning, uncontrolled fires, unsustainable logging, unplanned settlements and destructive mining practices. Furthermore, the study explored the root causes of the threats at local, national and global level.

The EAME Strategic Framework 2004 – 2024 identified threats such as beach pollution, erosion and destruction of mangroves, reef damage, removal of coral and mangroves, conversion of mangroves areas for salt production and port development, use of destructive fishing gears such as seines, small marsh nets and dynamites and over exploitation of fishery resources e.g. turtles and commercial trawling.

This study identified the following gaps: -

5.1 THE LOCAL CHALLENGES AND THREATS

The local challenges and threats identified in the GEZA EACFE and EAME reports include high population growth, lack of alternatives, declining respects to traditional forests protection systems and lack of alternative economic activities.

5.1.1 Poverty

The Hogan A.R et al (2000) study concluded that, 'we are all poor here' means that most households in the villages along the coastal areas are poor with income per capital below the poverty line, which is below 1US Dollar per day. Most people depend on agriculture and fishing activities. Both farmers and fishermen are small-scale producers using simple tools. Women fish for small pelagic shrimp, known locally as *udavi* near the seashore while men fish for larger prawns and fish in deep waters. In the delta, both men and women cut and dry Phoenix palm (Ukindu) for mat making and for sale. The poverty problem is due to low income obtained from economic activities. For example, in Bagamoyo, an ordinary fisherman earns the equivalent of about US$ 300 per year from fishing. In Rufiji average income from fishing is about US$ 160 per year. Village government has few sources of revenue. Poor infrastructure such as roads – Dar es Salaam – Kibiti – Nyamisati is so bad that trade among these areas is affected and goods from the delta are often stranded. Trade in prawn has been seriously affected, with consequences for the income of the majority of the people.

Also market for agricultural commodities are unreliable. Low prices for fish and farm produces is persistence problem in coastal areas due to high transportation costs, poor transportation infrastructure and inadequate markets. Because of the inadequate of markets and poor transportation, most farmers concentrate on cutting of mangroves for sale.

5.1.3 Resource Use and Management

The resource use in the coast areas is according to the First, land tenure system that do exist. For example, in Bagamoyo and Rufiji, the intact mangrove forest area are held by the government as forest reserves and managed by the Forestry and Bee-Keeping Division of the MNRT. The 'islands' of the Rufiji Delta are also legally governed as forest reserves, despite the fact that, some areas are in rice fields rather than mangroves. Second, the customary land tenure in which the clan has use rights over certain pieces of land and apportions them to clan members. Thirdly, village land, the land can be

apportioned to individuals by the village government upon request. The major issues regarding coast forests are not ownership but rather encroachment and fires.

5.1.4 Agricultural Production

Agriculture is an important activity in coast areas of Tanzania. Over 70 percent of the populations are engaged in farming as their first priority. Main crops grown include paddy rice, cassava, cashew nut, coconut, maize, banana, simsim, millet, sweet potato, fruits, vegetables, and legumes. In Rufiji for example, cultivation of rice is very important for survival of the people, to the extent that farmers believe 'without paddy cultivation, many people would have died here'. Rice is harvested twice a year in some of the areas. Although, agriculture is in small scale due to economic, social, ecological and institutional problems still there is rampant expansion of farms because of the need to increase incomes, to get more yields and to be able to support big families. These are driving forces for deforestation in coastal areas. At local level, expansion of agricultural area is a direct cause of habitat change. New farms are being opened in Rufiji delta although such expansion is illegal because the government has prohibited further clearing.

Some of the man ecological problems for agriculture include inadequate land, inadequate fertility, diseases, vermin, and pests. Agriculture also affected by natural processes. For example, the Rufiji changed course some years ago, resulting in changed patterns of erosion, deposition, and salt penetration into different parts of the delta. Some farmers reacted to these changes by clearing mangroves and introducing rice into areas that now experience less salinity.

Shifting cultivation is a major agricultural system in coastal areas where this system yields is initially high in a newly opened rice fields in the mangroves but decline after the third year and the field is abandoned due to weed invasion by the seventh year. This practice led to clearing of mangrove forests every time a new field is opened. Shifting cultivation is a threat to the mangroves despite the ban on expansion and opening of new farms in the delta.

5.1.5 Harvesting of Mangrove Products

The harvesting of mangrove products, especially for commercial use is a major direct cause of biodiversity loss in the delta because it destroys critical habitat. Mangroves are harvested and used locally for boat making, including dhow ribs, rails, and to lesser extent keels, as firewood and charcoal, and for preparing fish traps. Most of the houses in Rufiji and Bagamoyo are constructed from mangrove poles. In some fish landing areas and rice farms, people live in huts built on platforms supported by mangrove poles.

Mangrove cutting is an economic activity that provides employment for many people. For example, in the Rufiji Delta, dhow construction is a thriving business, and 60 to 100 dhows employ up to ten youths each as seamen.

Another threats to biodiversity loss, is harvesting of mangrove products for firewood or charcoal. Although, firewood collection is permitted only from dead wood and trees but in coastal forests commercial charcoal production involve felling trees. In Bagamoyo, charcoal makers stay in the mangrove forests temporarily to harvest these resources. Charcoal making is more widely practiced in the Ruvu and Wami Deltas than in Rufiji. Charcoal and firewood are sold in Zanzibar, Bagamoyo and Dar es Salaam. Charcoal making and fire wood selling are also important sources of revenue and employment for most of the people in Bagamoyo.

5.1.6 Fishing

The biggest cause of biodiversity loss in relation to fishing at local level is not only poor fishing gears and practices but also lack of awareness. For example, local people in Rufiji Delta use stake traps (*wando*) made from the roots of *Rhizophora mucronata*. With this technique, fishermen block the large part of a small channel by planting wooden stakes in a V-shape so that fish are stranded during low tide. This process is destructive because it affects the roots of the plant and may kill the entire plant. Also, these traps are wooden together so tightly that even juvenile fish are trapped. These practices and technologies are not sustainable and it appears that most fishermen are not aware of the dangers of using them.

5.1.7 Mining

Mining within forests is an activity that has direct implications to biodiversity loss as identified in EAME report but also the size of the cleared area is not yet to be known (Senkondo, 2000).

5.2 THE NATIONAL CHALLENGES AND THREATS

The national challenges and biodiversity threats include economic policies that aimed at achieving economic growth largely without regard to implications for the environment. Often, this has resulted in over exploitation of coast forests and loss of biodiversity. Conflicting objectives and interests in the use coastal forests among government ministries and departments, being it land for salt making or tourism, forestry or fisheries have contributed to the biodiversity loss in the coast areas and continue to pose threats.

Lack of co-ordination among various institutions has led to undesirable outcomes for the environment in the coastal areas. The objective of the national investment promotion policy of 1992 is to promote maximum mobilization and use of domestic capacity. The achievement of such a goal poses significant threats to biodiversity in a situation where co-ordination of activities is lacking among those sharing common resources to achieve their specific goals.

5.2.1 Socio-Economic Development Policies

The government of Tanzania experimented various policies and strategies in an effort to improve the welfare of its people. These policies and strategies have alienated people rather than involving them in the desired development, because they have relied on command-and-control or top-down approaches to economic development and resource management. For example, Tanzania experienced *Ujamaa* strategy (1974 – 1976), which optimized the African Socialism with intentions of improving the welfare of the people through collectivizing them in *Ujamaa* villages.

The strategy was blamed for contributing to environmental degradation and hence biodiversity loss due to bush clearing for village settlements and farmland. In an attempt to resolve the constraints, Tanzania government initiated several economic programmes including the National Economic Survival Programme (NESP) of 1981 with the aim at revamping the ravaged economy and restore balance of payment in the external sector. The NESP was replaced by Structural Adjustment Programme (SAP) in 1983, with similar objectives of solving structural problems and stabilize the economy. The SAP was to improve economic performance of the public sector through introduction of incentives for increased production of goods and services for both domestic and external markets.

Economic Reform Programme (ERPI) was introduced in 1986 to replace the SAP with objective similar to NESP and SAP but differed in strategy. The strategy was to establish market economy that includes decontrolling prices, removing subsidies and enhancing labour efficiency and productivity by reforming

employment in the public sector. The effects of the ERP I on the people included reduction of expenditures on education, health, and agricultural and forestry extension services. In 1989 – 1992 ERP II was introduced and was renamed as Economic and Social Action Programme (ESAP) aimed at correcting the adverse effects of its predecessors while continuing with the objective of ERP I.

One of the side effects of these economic programmes on natural environment and thus biodiversity has been the loss of necessary funds for basic environmental services. Natural resources management, especially extension services, monitoring and enforcement of rules and regulations is labour intensive activity. The instrument employed by SAP policies included removal of subsidies from government sectors, reduction of staff in government department and freezing of employment.

These measures have affected the delivery of services in the department of Forestry and Bee-Keeping in the MNRT, among others.

Due to shortage of manpower and funds for recurrent expenditure for daily monitoring and enforcement activities not only to government departments but also to other actors, it creates an environment conducive to the illegal harvesting of coastal forests for charcoal making and poles.

5.2.2 Legal Issues and Enforcement

Tanzania has many legal provisions for the coastal forests management and several institutions responsible for the implementation and enforcement of rules. However, the main issues have been lack of effective enforcement of laws and rules, low penalties for offenders, and a long and cumbersome procedure to enact and pass by-laws relevant at village level. Currently, some of the penalties are low compared to the cost of the damage to the environment and magistrates use their discretionary powers to reduce sentences further.

5.2.3 Conflicting Interests and Institutional Co-ordination

Various institutions have involved in management of coastal forests in Tanzania but the management has been poor. A key issue is the lack of effective co-ordination among various institutions involved. No authority exists to reconcile conflicting interests among government institutions including licenses for fishing, harvesting coastal forests, and salt making. The collision includes the Division of Forestry the Division of Lands, the Division of Fisheries, the Ministry of Water and Livestock Development, Ministry of Energy and Minerals (mineral prospecting and salt making), Land Use Commission, Environment (Vice President's Office), Ministry of Local Government. The activities guided by policies and regulations from these institutions have often conflicted with each other due to different immediate objectives and lack of harmonization or co-ordination of policies needed to achieve the much wider objective of sustainability.

5.2.4 Forest Policy

The new forest policy of 1998 aimed at ensuring that ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility. The policy state that, new forest reserves for conservation will be established in areas of high biodiversity value and that biodiversity conservation and management will be included in the management plans for all protected forests. Involvement of communities and other stakeholders will be encouraged through joint management agreements. Biodiversity research and information dissemination will be strengthened.

However, the lack of capacity to enforce rules and regulations is a major issue for biodiversity conservation. Most resource use policies have over-emphasized control and prohibitions without the means or capacity for enforcement and inadequately addressed traditional interests of the people or their involvement in the management of coastal forests.

Also, unequal distribution of revenues among the central government, local government and the communities has been a problem. For example, treasury takes 30 per cent and the remaining 70 per cent is then distributed to other stakeholders. Also, the decentralized policy has not been put into practice. Policies remain centrally planned and directed, thus complicating implementation of projects and plans at the local level. Bureaucratic procedures also frustrate management efforts. Finally, political interference in matters that are purely technical is also a problem.

5.2.5 Land Tenure

The issue of land tenure is another policy issue that relate to biodiversity loss. There exist a debate that, lack of tenure security discourages long term investment in land. However, another school of thought suggest that, security of tenure is not a guarantee that long term investment will be undertaken or that an investment will not cause biodiversity loss.

The issue of land tenure system has resulted into acute land problems and conflicts. However, the new land policy 1995, contains conservation issues as it states that, ‘a mechanism for protecting sensitive areas will be created. Sensitive areas include water catchments areas, small islands, border areas, beaches, mountains, forests, national parks, rivers, river basins and banks, seasonal migration routes of wildlife, national heritage, and areas of biodiversity.

Various efforts to resolving multiple use of coastal forests have been sought by implanting various project including the Rufiji Environmental Management Project (REMP) and the Tanzania Coast Management Programme (TCMP) has just started co-ordinating various programmes operating along the coastal areas of Tanzania. However, together with the above-mentioned efforts, to better address co-ordination and sustainable use of coastal forests, a body responsible for solving conflicts over multiple land uses should be established.

5.3 GLOBAL CHALLENGES AND THREATS

At Global level, GEZA EACFE identified macro-economic policies of the International Financial Institutions, and the International Market and Demand on Tourist Attractions. However, these challenges and threats can be expanded to include: -

5.3.1 Foreign Markets and International Trade Conditions

The foreign markets of coastal forests are historical, starting with Arab Countries of Yemen, Saudi Arabia, and the Emirates. Currently, most charcoal, firewood, and mangrove poles harvested in coastal deltas are transported to Zanzibar for sale. Some mangrove poles transported to Zanzibar find their way to the Arab states. In Zanzibar, mangrove poles are in high demand for house construction. The tourism industry is picking up and many hotels are being built on the island. Hotel construction uses a lot of mangrove, the bulk of which comes from the Rufiji Delta. This mangrove trade is illegal but no regulations empower the natural resources officers in Zanzibar to seize illegally obtained mangrove poles.

5.3.2 International Financial Institutions

The International Monetary Fund (IMF) and the World Bank (WB) are among international financial institutions that influencing socio-economic activities in Tanzania. They have facilitated the development of programmes with unintended adverse effects on environment. The NESP, SAP, ERPII and I did no address the environment instead these policies encourage economic growth without environmental consideration.

5.3.3 Foreign Private Investment Capital

Foreign private investment is locked upon as important in facilitating economic growth through transfer of modern technology for efficient production that would not otherwise be available to the country, given shortage of capital. Today there is mushrooming foreign investment in the sector of minerals, tourism, and agriculture for country's development. However, that economic growth is desirable for the betterment of the country's population but we have to careful about the nature of the development for which we strive.

We must avoid development that provides short-term benefits a few but leaves the majority bearing the cost of environmental degradation.

The costs and benefits should be balanced through a well-rounded analysis that integrate all sectors and stakeholders to determine the socio-economic and environmental costs and benefits before any major decision is taken.

5.3.4 AID, UN Agencies and Other International Organizations

The international organizations in Tanzania play a great role hence are appreciated. Their assistance serves mostly to fill the gap in terms of expertise, financial inputs and providing a wider audience for important humanitarian, conservation, and development issues by linking the local scene with the outside world. International bodies such as the UN organizations provide leadership in various spheres of interest to the world community.

Various international organizations in Tanzania work in humanitarian assistance, development projects, capacity building, and environmental matters such as biodiversity conservation and management.

Further, Tanzania is also a signatory to the CBD, among other conventions and treaties. This convention gives Tanzania the opportunity to contribute to global initiatives for the conservation of biodiversity and makes it eligible to benefit from technology transfer, financial assistance, scientific and research co-operation and capacity building.

6. MAIN ISSUES/CONSTRAINTS TO CONSERVATION AND SUSTAINABLE MANAGEMENT OF NATIONAL COASTAL FORESTS

The conservation and management issues/constraints of national forests in Tanzania are:

- ✓ Lack of institutional capacity to enforce rules and regulations and the over emphasize on control and prohibition without means and capacity for enforcement and inadequately addressed traditional interests of the people and their involvement in the management of coastal forests.
- ✓ Inadequate awareness about conservation and management principles of coastal forests. Hence unsustainable utilization of coastal forests.
- ✓ Lack of development skills for sustainable management of coastal forests
- ✓ Over exploitation of coastal forest resources e.g. Pterocarps angolensis and the issue of on going depletion of preferred species near the villages as a results people are forced to look for these species in the proted areas hence hinder conservation efforts.
- ✓ Loose wood rot transportation regulations due to low enforcement mechanisms at all levels.
- ✓ Lack of tenure security discourages long-term investment in land resulting into land problems and conflicts.
- ✓ Foreign market policies that focus on economic growth jeopardizing environmental sustainability.
- ✓ Foreign private investment in the sectors of mining, tourism, and agricultural is locked upon economic growth through transfers of technology for efficient production hence ignoring the environment.
- ✓ Unsustainable fishing activities in marine ecosystems e.g. smoking using fuel wood, poor fishing gears and practices.
- ✓ Unsustainable salt making using mangrove for salt production in deltas
- ✓ Poor infrastructure i.e. poor road network, inadequate markets, health facilities, schools, water supply and sanitation.
- ✓ Lack of local capacities to management resources
- ✓ Poverty and vulnerability to climatic conditions
- ✓ Traditional socio-cultural practices i.e. taboos and religious marriage system leading to an increase of family size hence population pressure to coastal forests.

Information to be included in the EACFE Programme:

- Institution strengthening – public and private organizations involved in environmental conservation and management in Tanzania.
- Awareness raising and sensitization at all levels i.e. local, national and global
- Skills development for sustainable management of coastal forests
- Participatory forest management
- Community forests management
- Law enforcement
- Monitoring
- Inadequate policies
- Tracking/certification of wood products
- Enabling legislation/policy and practices
- Sustainable livelihoods as a strategy for promoting conservation and sustainable management of coastal forests

7.0 CONCLUSION

The socio-economic values of coastal forests of Tanzania are well recognized. There have been a considerable number of biodiversity investigations and conservation efforts in the hotspots. There are also important opportunities for further practical interventions and application of conservation science, particularly with respect to for forest fragmentation. The major threats to biodiversity values includes:- population and settlement pressure, unstable socio-cultural practices, unsustainable resource use and management, shifting cultivation, unsustainable harvesting of mangrove products, poor fishing gears and practices, salt making using mangroves, poor co-ordination among various institutions, economic growth without environmental concerns, inadequate enforcement of forest rules and regulations, shortage of funds and manpower, conflicting interests of institutions, insecurity tenure of land, foreign markets and focus of international financial institutions on foreign private investments which is locked upon as important in facilitating economic growth with little attention to environment.

Further, the major threats to the biodiversity loss arise from the needs of impoverished local people to improve their livelihoods. The people focus will be on the interference between biodiversity and development and will address ways in which local populations can benefit from and contribute to, biodiversity conservation in the hotspot. The review report has identified socio-economic issues that were not fully addressed in the GEZA EACFE Action Programme that limited on agricultural expansion, charcoal production, uncontrolled fires, unsustainable logging, unplanned settlements and destructive mining practices. The EAME Strategic Framework 2004 – 2024 focus more on sustainable livelihoods particularly issues of good governance of local natural resources and industrial fisheries.

ABBREVIATIONS USED IN THE TEXT

ACC – African Conservation Center
AWF – Africa Wildlife Foundation
DCCFF- Department of Commerce,
FoC – Friends of Conservation
EACFE – Eastern Africa Coastal Forest Eco-region
EAME – Eastern Africa Marine Eco-region
EAWLS – East Africa Wild Life Society
EANHS – East Africa Natural History Society
FRCMP – Forest Resource Conservation and Management Programme
FBIPP- Forestry Based Industries and Products Programme
GDP – Gross Domestic Product
GEF – Global Environmental Facility
IHRDP – Institutions and Human Rights Development Programme
LRFP- Legal, Regulations Framework Programme
MNRT – Ministry of Natural Resources and Tourism
NFP – National Forestry Policy
REMP – Rufiji Environmental Management Project
RUDECT – Rural Development & Environmental Conservation Trust
SFM – Sustainable Forest Management
TANAPA – Tanzania National Parks Authority
TAFORI – Tanzania Forestry Research Institute
TAWIRI – Tanzania Wildlife Research Institute
TFS – Tanzania Forests Services
TFCGs – Tanzania Forest Conservation Groups
TFAP – Tanzania Forest Action Programme
WD – Wildlife Department
WCST – Wildlife Conservation Society of Tanzania
WWF – World Wide Fund for Nature

REFERENCES

Burgess N.D and Clarke G.P (2000), Coastal Forests of East Africa, IUCN, Gland Switzerland and Cambridge, Uk.

Burgess N.D et al (2003), Ecosystem Profile: Eastern Arc Mountains and Coastal Forests of Tanzania and Kenya Biodiversity Hotspot. A Report submitted to Critical Ecosystem Partnership Fund.

Durand J (2003), Implementation of the Rufiji Forest Action Plan. With Special Emphasis on Community Based Natural Resources Management and a Case Study of Ngumburuni Forest, REMP Technical Report No. 45 Dar es Salaam.

Hawthorne, W.D (1993), East African Coastal Forest botany. In Biography and Ecology of the Rain Forests of Eastern Africa. Cambridge University Press, Cambridge.

Hogan A.R, Mwambeso P.A, Chirwa E.B, Chande M.A, Nandi R.X and Mbaga N.O (2000), 'We are all poor here' Some socio-economic observations on Rufiji Flood Plain and Delta. REMP Technical Report No. 3 Dar es Salaam.

Kaale, B.K, Ndilanha A.E, Songela F and Abdi H (2000), Fuel wood and Charcoal Uses with possible Alternative Energy Sources in Ikwiriri Township and Mbuju Mvuleni Village, Rufiji District. REMP Technical Report No. 4, Dar es Salaam.

Kitula, R.A (2001), The Use of Medicinal Plants for Maternal Care and Child Survival in Tanzania: A Case of Villages Around Zaranige Forest Reserve in Bagamoyo District. A Dissertation submitted for the fulfillments of the Degree of Master of Science in the Management of Natural Resources for Sustainable Agriculture, SUA Morogoro.

Levett, J.C (1992), Classification and Affinities of the Eastern Arc Moist forests of Tanzania. PhD. Thesis, University of Wales, Bangor.

Lovett, J.C (1993), Eastern Arc moist forest flora. In Lovett J.C and Wasser S.K (eds), Biography and Ecology of the Rain forests of Eastern Africa. Cambridge University Press, Cambridge.

Maganga, F.P and Odgaard R. (2002), Planning and Implementing Community Based Forest Management in Kilwa and Lindi Districts. A report submitted to Ministry of Foreign Affairs and DANIDA, Dar es Salaam.

Malimbwi, R.E (2000), An Inventory Report of the Principal Timber Resources of the Miombo and Riverrine Woodlands and Forests of Rufuji District. REMP Technical Report No. 12. Dar es Salaam.

Mwamfupe, D. G (1997), PCIP Report on Pugu and Kazimzumbwi Forest Reserves, A Report submitted to WWF- Tanzania Programme Office, Dar es Salaam

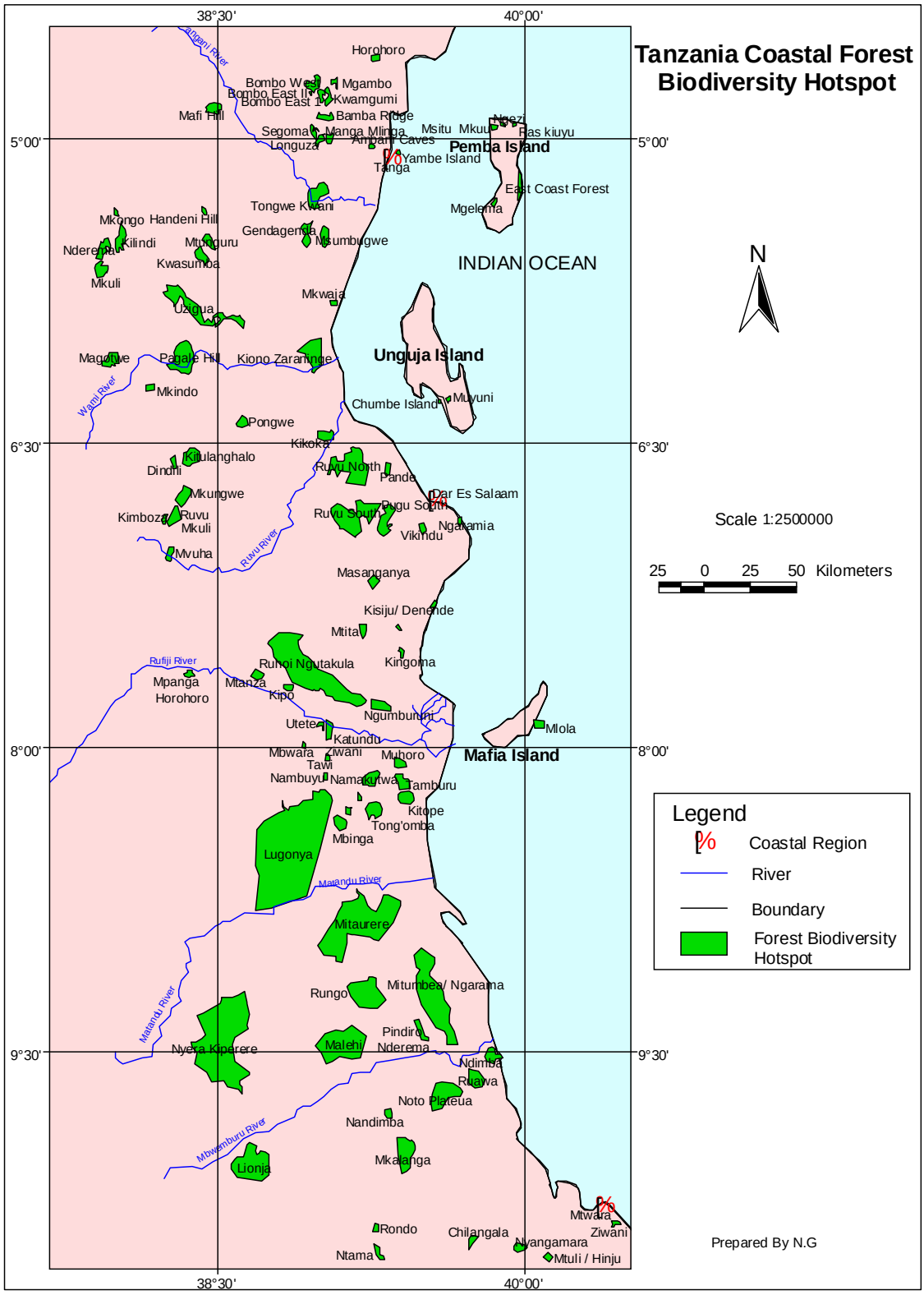
Kemp, J, Hatton J.C and Sosovele (2000), East Africa Marine Ecoregion, Reconnaissance Synthesis Report. Submitted to WWF – Tanzania, Dar es Salaam.

Richmond, M.O, Wilson J.D.K, Mgaya, Y.D and Le Vay L (2002), An Analysis of Smallholder Opportunities in Fisheries Coastal and Related Enterprises in the Floodplain and Delta Areas of the Rufiji River Tanzania. REMP Technical Report No. 25. Dar es Salaam.

Senkondo E. M.M (2000), Socio-economic survey of Zaraninge Proposed Forest Reserve in Bagamoyo District, Tanzania. A Report Submitted to WWF-Tanzania Programme Office, Dar es Salaam.

Wood, A et al. (2000), The Root Causes of Biodiversity Loss, Earthscan Publications Ltd, Landon

ANNEX I


Tanzania Coastal Forest Biodiversity Hotspot
38°30'
40°00'
5°00'
6°30'
8°00'
9°30'
INDIAN OCEAN
Pemba Island
Unguja Island
Mafia Island
Horohoro
Bombo West
Bombo East II
Bombo East I
Mgambo
Kwamgumi
Mafi Hill
Bamba Ridge
Segoma
Manga Mlinga
Msitu Mkuu
Ras kiuyu
Longuza
Ambari Caves
Yambe Island
Tanga
East Coast Forest
Mgelema
Tongwe Kwani
Mkongo
Handeni Hill
Gendagenda
Mtonguru
Msumbugwe
Nderema
Kilindi
Kwasumba
Mkuli
Mkwaja
Uzigua
Magomwe
Pahale Hill
Kiono Zaramnge
Mkindo
Wami River
Chumbe Island
Muyuni
Pongwe
Kikoka
Kilulanghalo
Dindili
Ruvu North
Pande
Dar Es Salaam
Mkungwe
Kimboza
Ruvu
Mkuli
Ruvu South
Pugu South
Ngarama
Vikindu
Ruvu River
Mvuha
Masanganya
Kisiju/ Denende
Mtita
Rufiji River
Ruhoi Ngutakula
Kingoma
Mpanga
Horohoro
Mtanza
Kipo
Ngumburuni
Utete
Mlola
Katundu
Mbwara
Ziwani
Muhoro
Tawi
Nambuyu
Namakutwa
Tamburu
Kitope
Tong'omba
Mbinga
Lugonya
Matandu River
Mitaurere
Rungo
Mitumbea/ Ngarama
Pindiro
Malehi
Nderema
Nyera Kiperere
Ndimba
Ruanva
Noto Plateua
Nandimba
Mbwemburu River
Mkalanga
Lionja
Mtwara
Ziwani
Rondo
Chilangala
Nyangamara
Ntama
Mtuli / Hinju
N
Scale 1:2500000
25 0 25 50 Kilometers
Legend
Coastal Region
River
Boundary
Forest Biodiversity Hotspot
Prepared By N.G