

DEPARTMENT OF COMMERCIAL CROPS, FRUITS AND FORESTRY

ZANZIBAR

**VEGETATION RECONNAISSANCE SURVEY OF KIWENGWA FOREST RESERVE OF
ZANZIBAR - TANZANIA**

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INTRODUCTION

Zanzibar is located in the Indian ocean, just off the coast of East Africa, lying at 39⁰ East and 6⁰ South of Equator with an area of 2641. According to Tanzania Census (1988), Zanzibar inhabits 640,578 people of which 375,538 are in Unguja and 260,039 are in Pemba. The annual population growth rate was estimated to be 3.3% and the estimated average population density is about 300 people per Km².

The climate of Zanzibar is tropical and maritime, and follows the monsoon winds. The main rain season (*masika*) occurs between March and June. The short rains (*vuli*), usually starts in October and ends in December. However, some inter-monsoonal precipitation takes place. Record shows that one fifth of total rainfalls between the rain seasons, which is dominated by a binomial rainfall pattern. The average rainfall for the island is about 1500 mm per annum. February – March is the driest period of the year with about 20mm of rainfall. The highest temperatures occur during the short dry season with a maximum mean of 33°C in Unguja and 29°C in Pemba. The minimum temperatures for Unguja and Pemba are 23.3°C and 21.1°C, respectively

Soils: The Zanzibar soils are mainly categorized into two classes; the shallow, acidic, infertile, rocky coral rag soils in the east and deep, fertile soils in the west. Larger proportion of western side of the islands has been overlain with alluvial sands, silts and clays with freely drained reddish soils formed from these sediments termed "*kichanga*". Darker "*kinongo*" soils, derived from limestone parent materials, are found towards east. The remaining "*kinamo*" heavy soil type is found in isolated areas (Review Mission, 1991).

Agricultural sector contribute about 50% share of GDP and employs nearly 70% of labour force that earns about 90% of export value. The contribution of the forestry sector to the national economy is not calculated separately from the agricultural sector. It combines agriculture, livestock, forestry and fisheries. The total land under agriculture and forestry is about 99%. Forestry woodlands cover about 16.2% of the total land, while grazing land and cultivated land cover 40.9% and 41.6%, respectively.

There are seven forest plantations in Zanzibar covering the total area of 12581 ha (5961 ha) Unguja and 2620 ha). Main plantation species include 57% Acacias (*Acacia auriculiformis* and *A. Mangium*), 24% *Casuarina equisetifolia*, 16% *Pinus caribaea* and 3% of other species such as *Tectona grandis* and *Eucalyptus species* and *Pinus caribaea*.

KIWENGWA FOREST RESERVE

Kiwengwa forest is situated in North Eastern Conner in the Northern region of Zanzibar main Island.

Unguja Island appear to have been once covered by dry evergreen and coral rag thickets. From 1970s, the coral of eastern arc from Chwaka north wards have been seriously depleted (high demand of wood resources and shifting cultivation).

Kiwengwa forest is the last remaining large patch of the forest that represent the biodiversity of the area. Kiwengwa forest is an important depended by many communities of the north region (fuel wood, medicinal plants and poles).It also important habitat that encompasses several Endemism and rare species of both flora and fauna.

The forest attains the status of forest reserve since 2003 and covers an area of 3333 hackers. It is a long stretch parallel to the eastern coast from Pongwe to north of Kiwengwa village

Kiwengwa forest is surrounded by several villages such as Kumba urembo, Cairo, Pongwe, Gulioni Mgonjoni and Mchekeni.

OBJECTIVES

Kiwengwa forest is a recent gazetted forest reserve with very few information on vegetation types and species distribution. Since Kiwengwa forest is adjacent to tourism zones, thus the gathering of information can also assist the tour guides once when tourism activities start. Therefore this vegetation reconnaissance survey has the following objectives;

- Identify vegetation types/habitats found in Kiwengwa forest.
- Explain the distribution of species, rare, and dominant species.
- Produce plant species list of Kiwengwa forest.

METHODOLOGY:

The already transect established to monitor red colobus monkey we re used to observe the vegetation types and species found in the forest.

Using these lines, spot observation after every 200m. were taken for the types of vegetation, canopy cover, average height and diameter range of the trees. While walking in the transect new species not found in each spot is listed. Also whenever change of vegetation habitat was experienced the record of all above information and distance is noted. This is a quick observation procedure since there was a limited time of four days for the field work.

RESULTS:

History shows that Kiwengwa forest is coral rag forest of high canopy with mature trees in most of its , but due to human activities such as fire ,shifting cultivation, cutting of fuel wood and building poles resulted to different types of vegetations:

The vegetation types recognized during the study are:

1 Shrub land.

These types of vegetation is experienced in areas where shifting cultivation takes place in recent years and areas with harsh soil conditions which makes the growth difficult. This seen in north western parts, western central parts in Mgonjoni and kidutani and near Pongwe village.

The most common species found are *Suregada zanzibarensis*, *Sorindeia madagascarensis*, *Eugenia spp.*, *Ficus sur*, *Dovyalis macrocalyx*, *Allopyllus*, *Flueggia virosa*, *Euclea racemosa*, *Macphersonia gracilis*, *Psiadia arabica*, *Polysphaeria pervifolia*, *Annona senegalensis*, *Mallotus*, *Todaliala*, *Vernonia*, *Ozoro obovata*, *Dodonea viscosa*, *Clerodendron*, *Tarrena turrea*, *Terminalia boivinii*, *Strychnos angolensis*, *Lannea*, *mystroxylon*, and *Encephalartos hildebrandtii*.

The average height is about 4m. or less with canopy cover between 30-50%.

It is a secondary vegetation with less 10cm. Diameter at breast height.

2 Mixed thickets:

This is experienced in areas where the most interesting species have been cleared and leave thorny trees , climbers and bush as a result it is difficult to pass through. This is experienced in Pongwe just after bush vegetation in ward within a distance of about 600m., North Eastern side and narrow belt near the road in the way from Kumba uremb towards Pongwe.

The average height is 7m. and canopy cover varies from 30- 60%. The common species here are: *Rhus*, *Diospyros*, *Polyspheria*, *Psychotria bibracteatum*, *Eugenia*, *macphasornia*, *Mimusopsis fruticosa*, *Mystroxyton*, *maytenus*, *Euclea*, *olea woodiana*, *Encephalartos* and climbers.

3. Low coral rag:

This is experienced in west and east sides of the forest after either thicket or shrub vegetations inwards from Kumba urembo to Pongwe. Some times is alternating with high coral rag. The average height range is 8-12m. and canopy cover is between 50- 60%.

The dominant species are *Encephalartos*, *Euclea*, *Diospyros*, *Macphersonia*, *Eugenia*, *Mystroxyton*, *Psychotria bibracteatum*. The regeneration is high and the forest has two storeys.

4. High coral rag:

This is a long stretch from Kumba urembo south wards to Pongwe at the middle of the forest. The average height is between 15 –20m and canopy covers over 70% except in disturbed areas. The diameter at breast height reaches up to 30cm. The dominant tree species include; *Eugenia spp*, *Encephalartos*, *Diospyros*, *Macpharsonia*, *Mystroxyton*, *Ozoroa*, *terminalia boivani*, and *Mimusopsis fruticosa*. The forest is open, with storeys and the regeneration is low, thus it is easy to pass through.

5. Others vegetation types:

These are the open patches resulted from fire which is dominated by ferns and pioneer species such as *Trema orientalis*, *Vernonia spp* and *Flueggia virosa*.

DISCUSSION:

From the result is shown that the vegetation near to human settlement or near the roads the vegetation are much affected, low in height and diameter, this is due to the fact that it is easy to transport material to the road and short distance walking to their shamba.

The shrub vegetation are seen most in the west side and the thicket is seen in the east, this implies that the use of the forest differs between two sides, shifting cultivation is more in the west but in east the forest is probably affected by fuel wood and building poles cutting as most of people in eastern sides engage in fishing activities.

There is high species diversity in shrub vegetation than in any other type of vegetation from pioneer to forest species and looks like an ecotone between the forests to agricultural areas.

There are species with wide distribution in all vegetation types such as *Encephalartos hilderbratii*, *Eugenia spp*, *Diospyros consolatae*, *Euclea racemosa*, *Mystroxyton aethiopicum*, *Psychotria bibracteatum* and *Olea woodiana*. Despite of distributed throughout the forest the *Olea* is more dominant in the north and *Diospyros*, *Eugenia* and *Encephalartos* are more in the southern part of the forest.

There are also species which only seen in the northern part and not in the south such as *Teclea simplicifolia*, *grewia spp*, *syzygium cumini*, *Sansevieria conspicua*, *Blighia unijugata* and *Bysocarpus orientalis*

The rare species includes *Pittosporum viridiflorum*, *Teclea simplicifolia*, *Steculia rynchocarpa*, and *Blighia unijugata* and *sansevieria conspicua*.

Despite of being rare Pittosporum is also threatened and few individual remain as it has high medical value also is a common food species for the adder's duiker. Eugenia is only restricted in Unguja and Pemba. Teclea have bee only recorded at Jozani, Misali and Msitu Mkuu forest throughout Zanzibar. A full list of species list is attached as appendix.

RECOMMENDATIONS

-what has done in this study is only a reconnaissance survey it is obviously more species can be identified if a systematic vegetation analysis be done.

-Many part of the forest have been changed from its original nature due to human activities and signs of forest cutting still exist in all vegetation areas, thus effort are needed to conserve the remaining vegetation with emphasis rare and endemic species.

-Because Kiwengwa forest is surrounded with communities that needs the resources from the forest participatory conservation can be the best option for sustainable utilization of the forest

List of plant species from Kiwengwa forest.

<i>Family</i>	<i>Scientific name</i>	<i>Local name</i>
<i>Euph</i>	<i>Drypetes natalensis</i>	<i>Mjafari</i>
"	<i>Croton pseudopulchelis</i>	<i>Mfusho</i>
"	<i>Bridelia micrantha</i>	<i>Mkarati</i>
"	<i>Suregada zanzibarensis</i>	<i>Mdimu msitu</i>
"	<i>Mallotus opposifolius</i>	<i>Mtumbika</i>
"	<i>Euphobia nyikae</i>	<i>Mkweche</i>
"	<i>Flueggia virosa</i>	<i>Mkwamba</i>
"	<i>Steculia rhynhocarpa</i>	<i>Muoza</i>
"	<i>Ehretia petioleris</i>	<i>Mtukutu</i>
<i>Eben</i>	<i>Euclea schimperi</i>	<i>Mdaa</i>
"	<i>Euclea racemosa</i>	<i>Msiliza</i>
"	<i>Diospyros consolatae</i>	<i>Mkururu</i>
<i>Cyc</i>	<i>Encephalatos hildebrandtii</i>	<i>Mgwede</i>
<i>Comp.</i>	<i>Vernonia zanzibarensis</i>	<i>Mtumbaku mwitu</i>
"	<i>Psiadia arabica</i>	<i>Mbebeta</i>
<i>Comb.</i>	<i>Terminalia boivani</i>	<i>Mkunguni</i>
"		<i>Muwanga</i>
<i>Cela.</i>	<i>Mytenus mossambicensis</i>	<i>Mnusi</i>
"	<i>Mystrixylon aethiopicum</i>	<i>Mlimbo</i>
<i>Big.</i>	<i>Markhamia zanzibarica</i>	<i>Mtalawanda</i>
<i>Aral.</i>	<i>Cussonia zimmermanii</i>	<i>Mpapai mwitu</i>
<i>Ann.</i>	<i>Mkilua fragrans</i>	<i>Mchofu</i>
"	<i>Annona senegalesis</i>	<i>Mtopetope</i>
<i>Anac.</i>	<i>Sorindeia madagascariensis</i>	<i>Mpilipilidoria</i>
"	<i>Rhus natalensis</i>	<i>Mkumba</i>
"	<i>Ozaroa obovata</i>	<i>Mng'ombe</i>
"	<i>Lannea schweinfurthii</i>	<i>Muumbu</i>
"	<i>Mimusopsis fruitcosa</i>	<i>Mnyevuu</i>

<i>Legu.</i>	<i>Dichrostachys cinerea</i>	<i>Mvunja shoka/Mgunga</i>
<i>Fern.</i>	<i>Nephrolepis biserrata</i>	<i>Mjimbi kuti</i>
“	<i>Lomariopsis warneeki</i>	“
<i>Dich.</i>	<i>Tapura fischeri</i>	<i>Mtama mwitu</i>
<i>Rub.</i>	<i>Psychotria goetzei</i>	<i>Mti mafuta</i>
“	<i>Tarenna pavettoides</i>	<i>Mchambebele</i>
“	<i>Psychotria bibracteafum</i>	<i>Mkonge</i>
“	<i>Pohysphaeria parvifolia</i>	<i>Mla paa</i>
<i>Til.</i>	<i>Grewia spp.</i>	<i>Mkole</i>
<i>Sapot.</i>	<i>Sideroxylon inarmis</i>	<i>Mkoko bara</i>
<i>Sapind.</i>	<i>Macphersonia gracilis</i>	<i>Mjoma</i>
“	<i>Dodonea viscosa</i>	<i>Mkengeta</i>
“	<i>Blighia unijugata</i>	<i>Mkuu Kilemba</i>
“	<i>Allophyllus spp.</i>	<i>Mchambebele</i>
<i>Papil.</i>	<i>Bysocarpus ovicutalis</i>	<i>Mpaava</i>
<i>Combre.</i>		<i>Muwanga</i>
<i>Pitt.</i>	<i>Pittosparum viridiflorum</i>	<i>Mpande</i>
<i>Ole.</i>	<i>Olea woodiana</i>	<i>Mlimbo</i>
<i>Myrt.</i>	<i>Eugenia spp.</i>	<i>Mkaaga</i>
<i>Myrs.</i>	<i>Rapanea melanophleas</i>	<i>Mkangala shamba</i>
<i>Mora.</i>	<i>Ficus sur</i>	<i>Mkuyu</i>
“	<i>Ficus natalensis</i>	<i>Mla ndege</i>
“	<i>Ficus lutea</i>	<i>Mlangawa</i>
<i>Melia.</i>	<i>Turrea floribunda</i>	<i>Mtamagoa</i>
“	<i>Bersama abyssinica</i>	<i>Mwangwa kao</i>
<i>Log.</i>	<i>Strychnos angolensis</i>	<i>Mvuje msitu</i>
<i>Ican.</i>	<i>Apodyles dimidiata</i>	<i>Muwongoti</i>
<i>Flac.</i>	<i>Dovyalis macrocarly</i>	<i>Mtumbua</i>
	<i>Synaptolepis kirkii</i>	<i>Mbibikiu</i>
	<i>Rhoicissues revoilii</i>	<i>Mtongo</i>
	<i>Delbergia spp.</i>	<i>Mvyongozi</i>
	<i>Teclea simplicifolia</i>	<i>Mvundo vundo</i>
	<i>Sansevieria conspicua</i>	<i>Katani pori</i>
	<i>Todalialia asiatica</i>	<i>Mdaka komba</i>
	<i>Syngium cumini</i>	<i>Mzambarau</i>
	<i>Lactana camara .</i>	
	<i>Clerodendron</i>	