

**MANAGEMENT PLAN**  
**FOR THE**  
**GENDA GENDA FOREST RESERVES**  
**HANDENI DISTRICT, TANZANIA**

**G P CLARKE**

**SEPTEMBER 1991**

## SUMMARY OF MANAGEMENT PLAN

SITE : Genda Genda North and Genda Genda South Forest Reserves

MAP SHEETS : East Africa 1:50,000 Series Y742, sheets 130/3 and 149/1.

GRID REF : Genda Genda North    5<sup>0</sup>32'S, 38<sup>0</sup>39'E  
   5<sup>0</sup>34'S, 38<sup>0</sup>38'E

LOCALITY : Handeni District, Tanga Region, Tanzania and partly in Pangani District, Tanga Region, Tanzania.

STATUS : Genda Genda South - Central Government Protective Forest Reserve. Genda Genda North - Protective Forest Reserve.

MANAGED BY: Handeni District Forestry Office

AREA : Genda Genda South - 19.2 km<sup>2</sup>  
      Genda Genda North - 8.9 km<sup>2</sup>

TENURE : Both Reserves are wholly owned by the Government of the United Republic of Tanzania.

SITE DESCRIPTION : A Coastal Forest of the Zanzibar-Inhambane undifferentiated forest (according to White, 1983, UNESCO), located on the escarpment edge of a coastal ridge and including the Genda Genda Hills.

MANAGEMENT POLICY : To protect the site from uncontrolled anthropogenic activity, including logging, poiling, charcoal burning, hunting and clearing for agricultural land.

To conserve the water catchment value of the area.

To control fires in the surrounding woodland.

To replace and replant exploited tree species.

To stop illegal hunting activities in the area.

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## PART 1 - DESCRIPTION OF THE GENDAGENDA FOREST RESERVES

### 1.1 INTRODUCTION

#### 1.1 PURPOSE AND SCOPE OF THE MANAGEMENT PLAN

To set out management policies for the Gendagenda forests, which have hitherto been neglected.

To meet the criterion of the Catchment Forestry Programme in preserving the catchment value of the Gendagenda forests.

#### 1.2 NATIONAL AND REGIONAL BACKGROUND

The Gendagenda forest reserves comprise two of 33 forest reserves in Tanzania known to contain Zanzibar-Inhambane Undifferentiated forest (see Burgess et al. 1991). Regional distribution of these forest reserves are :

|               |    |   |
|---------------|----|---|
| Tanga Region  | 6  | Reserves (including Gendagenda North & South) |
| Coast Region  | 11 | Reserves                                      |
| Lindi Region  | 11 | Reserves                                      |
| Mtwara Region | 2  | Reserves                                      |
| Pemba Island  | 3  | Reserves                                      |
| Zanzibar      | 1  | Reserve                                       |

Zanzibar-Inhambane Undifferentiated forest does not occur outside these regions in Tanzania, although it is present in the Kenyan, Mozambiquan and Somalian littoral.

### 2.1 GENERAL INFORMATION.

#### 2.1.1 LOCATION AND ACCESS

Region : Tanga

Districts : Handeni (and Pangani for Genda Genda North only).

Nearest Town : Gendagenda (bordering Gendagenda South Forest Reserve)

Nearest Forestry Office : Pangani 35 km

Local Planning Authority : Handeni Ward Council  
Pangani Ward Council

Parliamentary Constituencies : Handeni and Pangani

Grid Ref : 5<sup>0</sup>34'S 38<sup>0</sup>38'E Genda Genda South  
5<sup>0</sup>32'S 38<sup>0</sup>39'E Genda Genda North

Area : 19.2 km<sup>2</sup> Genda Genda South  
8.9 km<sup>2</sup> Genda Genda North

Maps : East Africa 1:50,000 Series Y742, sheets 149/1 and 130/3.  
Handeni District map (1:250,000)

Aerial Photographic Coverage : December 1954 by Air Survey Company  
June - September 1981, May - July  
1981 Geosurvey International Ltd.  
Dec. 1982- Feb 1983 J.A. Story and  
Partners.

Access : 20 km east of Kabuku on main Chalinze - Segera highway.

## 2.1 MAIN FEATURES

Hills : Escarpment edge rising from 100m to 200m; from the central plain to the inland plateau and Masai Steppe. Twin peaks of Gendagenda hills rising to 545m.

Forest : Forest cover on hills and escarpment edge.

Reserve : Two Forest Reserves : Gendagenda North (8.9 km<sup>2</sup>)  
Gendagenda South (19.2km<sup>2</sup>)

Village : Gendagenda village (pop. 1800) 1km SE of Gendagenda hills.  
Kwedihwawala village (pop. not known) 2km to SW of Gendagenda hills.

Railway : Northern line (DSM - Moshi/Tanga) runs 1 km east of Gendagenda hills.

Road : Handeni - Pangani road runs through Gendagenda South Forest Reserve, 2 km north of Gendagenda Hills.

## 2.2 ESTABLISHMENT, STATUS, ADMINISTRATION AND MANAGEMENT

### 2.2.1 HISTORY OF ESTABLISHMENT

Date Notified : Genda Genda South declared and notified 1910.  
Date of creation of Genda Genda North unknown.

### 2.2.2 OFFICIAL STATUS

Both reserves constituted under 1947 Tanganyika Laws, Cap 132.

Both reserves designated Catchment Forest Reserves in 1972.

Gendagenda South - Central Government Protective Forest Reserve.

Gendagenda North - Protective Forest Reserve.

### 2.2.3 LAND TENURE AND RIGHTS OF WAY

Both reserves wholly owned by the Government of the United Republic of Tanzania.

The Pangani - Handeni road passes through Gendagenda South Forest Reserve.

#### 2.2.4 MANAGEMENT AUTHORITY AND CURRENT MANAGEMENT

Both reserves currently managed by the Handeni District Forestry Office.

Forest Warden provided under the Catchment Forestry Programme.

#### 2.2.5 SITE DEFINITION AND BOUNDARIES

Boundaries of both reserves are shown on map. The boundary of Genda Genda South is taken from the original surveyed by the Germans in 1910 (map), which contained some errors. The boundary of Genda Genda North is taken from the survey map of 1966 (map JB). Genda Genda South boundary also described under Cap 389 Supp 59 (Tanzanian Forestry Division).

There appears to be an overlap of the two reserves, such that 1km<sup>2</sup> is common to both.

#### 2.2.6 LEGAL AND OTHER CONSTRAINTS :

Genda Genda South is a protective reserve.

Genda Genda South is a Catchment Reserve under the Norad/Catchment Forestry Programme. Controlled and selective harvesting of trees will be permissible under this programme as long as this is carried out 50m or more from stream/river edges. Harvesting is for local uses only. No harvesting is permitted from slopes steeper than 40°, or from the biodiversity and amenity zones.

Presence of JKT (army) camp to the immediate west of both reserves could place constraints on tourist/research activities within the reserves.

#### 2.2.7 MAIN FIXED ASSETS

None.

### 2.3 ENVIRONMENTAL INFORMATION

#### 2.3.1 PHYSICAL ASPECTS

##### 2.3.1.1 CLIMATE

No precise climatic data is yet available for Genda Genda, but climatic information is available from Tanga, 70km to the north-east and on the coast :

Jan Feb Mar Apr May Jun Jul Aug

Average Monthly Rainfall (mm) 27 34 100 240 263 60 67 76  
 Average Mean Monthly Temp °C 24.3 27.6 28 28 26.3 24.6 23.3 22.9

Average Monthly Rainfall (mm) 83 111 133 50  
 Average Mean Monthly Temp °C 23.6 25.3 26.7 27.3

Average maximum monthly temperatures are about 4.33°C higher than the average mean monthly temperature, and average minimum monthly temperatures about 4° lower.  
 (Source EA Meterological Department 1960)

Climatic data from the nearby Mkwaja Ranch (30 km to the SW) is displayed graphically in Appendix 7.3.

Rainfall and temperature have been measured within Genda Genda Forest during the months of August and September 1991:

|                                  | August | September |
|----------------------------------|--------|-----------|
| Monthly Rainfall                 | 54mm   | 4mm       |
| Mean Monthly Maximum Temperature | 28°C   | 31°C      |
| Mean Monthly Minimum Temperature | 21°C   | 20°C      |

Prevailing winds are from the South East, and mist effect precipitation is present towards the summit of the peaks (shown by "spanish moss", a species of epiphytic lichen).

#### 2.3.1.2 HYDROLOGY AND DRAINAGE

Two major rivers flow eastwards across the reserves, including the Msilwa, which flows through Genda Genda South Forest Reserve. Numerous seasonal small streams also drain off the reserves, flow eastwards off the escarpment.

The permeable rocks which form the Genda Genda hills make them a more important source of groundwater than surface river water (pers.obs).

Major water courses are displayed on map 7.2.2.

#### 2.3.1.2 GEOLOGY

The Genda Genda hills consist of miocene sandstone or Neogene strata over meozoic strata (Hawthorne, 1984). In the beds of the larger streams and rivers, large small boulders are present, which may be of very hard sandstone, or even igneous rock.

The sandstones of the hills are permeable, whilst the lower mesozoic strata of the escarpment is impermeable.

#### 2.3.1.3 SOILS

Lower slopes of the escarpment consist of marine clays and mudstones of miocene to pleistocene age. These are blanketed by terrestrial sands, pebble beds and clay loams which are frequently overlain by red weakening sands of quaternary age. On the upper



ridges, the soil is brown to black with humus. There are areas of bare rock outcrops (Hawthorne, 1984).

#### 2.3.1.4 ALTITUDINAL RANGE

Gendagenda South Forest Reserve ranges from 100 - 545 m.

Gendagenda North Forest Reserve ranges from 100 - 220 m.

#### 2.3.1.5 GEOMORPHOLOGY

Both reserves are located on an escarpment edge, where the land rises from the coastal plain to the Masai Steppe. Along the escarpment the two large Gendagenda hills are located, which are contained entirely within the Gendagenda South Forest Reserve.

### 2.3.2 BIOLOGICAL ASPECTS

#### 2.3.2.1 HABITATS

Note : all areas are estimates only, and very approximate.

| Genda Genda South Forest Reserve.                 | km <sup>2</sup> | Canopy ht. |
|---|-----------------|------------|
| Forest : Dry evergreen coastal forest :           | 1               | 12m        |
| Forest : Dry semi-evergreen coastal forest :      | 11              | 13m        |
| Forest : Moist riverine coastal forest :          | 5 km            | 15m        |
| Forest : Dry evergreen coastal thicket forest     | 3               | 10m        |
| Woodland : Open savannah woodland (fire climax) : | 4               | 20m        |

| Genda Genda North Forest Reserve                 | km <sup>2</sup> | Canopy ht. |
|--|-----------------|------------|
| Forest : Dry semi-evergreen coastal forest :     | 1               | 12m        |
| Forest : Moist riverine coastal forest :         | 2 km            | 15m        |
| Forest : Dry evergreen coastal thicket-forest:   | 2               | 9m         |
| Woodland : Open savannah woodland (fire climax): | 5               | 20m        |
| Plantation : Neglected mango and coconut trees : | 1               | 20m        |

Areas of the Genda Genda Forest Block which are not within a reserve.

|   |    |
|---|----|
| Forest : Dry semi-evergreen coastal forest :    | 20 |
| Forest : Moist riverine coastal forest :        | 5  |
| Forest : Dry evergreen coastal thicket-forest : | 10 |

If allowed to revert back to its natural state, the areas of open savannah woodland would be succeeded by Dry semi-evergreen coastal forest and Dry evergreen coastal thicket-forest, provided further burning can be prevented. The plantation would be succeeded by dry evergreen coastal thicket-forest.

Areas within both forest reserves have been subject to severe anthropogenic disturbance, which has led to the change away from the natural habitat.

The different habitats are shown on map 7.2.3.

#### 2.3.2.2 FLORA

## VASCULAR PLANTS.

Collections have been made by Tanner and Proctor (Hawthorne, 1984). Survey carried out by Hawthorne in Genda Genda South in 1982. Further survey carried out in both Reserves by the 1991 Frontier-Tanzania TZ09 expedition. 123 species of vascular plant have been recorded so far for both reserves.

### a) Globally Scarce Species :

African violet (Saintpaulia sp.) - Genus known from 11 sites only.

### b) Nationally Scarce Species :

Densely ferruginous - pilose variety of Grandidiera boivinii

|                              |   |
|------------------------------|---|
| <u>Euphorbia quadrialata</u> | Only known from the Usambaras and Pangani forests |
| <u>Teclea simplicifolia</u>  | Only known from the northern coastal forests.     |
| <u>Uvariadendrom kiski</u>   | Only known from the northern coastal forests.     |

## BRYOPHYTES.

Collection made by the 1991 Frontier-Tanzania TZ09 expedition, awaiting identification by the British Bryological Society.

## ALGAE.

No data available.

## FUNGI

No data available.

## VEGETATION COMMUNITIES

### (i) Scarce :

Hawthorne (1984) reports that several floristic nodes occur in the Genda Genda South Forest Reserve, which are not recorded in other coastal forests.

Combretum - Sterculia semi-evergreen forest - drier type than that of other forests with the same canopy species dominance. Found on most of the slopes.

Ludia - Diopyros dry evergreen forest - an unusual type of dry evergreen forest, floristically related to aspects of the riverine vegetation of the Pangani river tributaries. Found on the east to south-east facing slopes.

## VEGETATION STRUCTURE

A 50 x 50m plot has been established in the Combretum-Sterculia Semi evergreen forest for which the following vegetation structure

is available.

|  |           |
|--|-----------|
| Mean Canopy Height                       | : 12.33 m |
| Mean Canopy Density                      | : 48.75%  |
| Mean Shrub Density                       | : 78.05%  |
| Mean Herb Density                        | : 10.55%  |
| Average Tree Height                      | :         |
| Average Bole Height                      | :         |
| Average Tree Diameter (at breast height) | :         |

The lack of understorey is very unusual vegetation structure for a coastal forest.

### 2.2.3 FAUNA.

All records refer to the whole forest except when stated.

#### MAMMALS:

30 species of mammal are recorded for the Genda Genda forests.

Primate numbers are extremely high, including the Angolan Black and White Colobus (Colobus angolensis/polykomos), baboons (Papio sp.), vervets (Cercopithecus pygerythus/aethiops), blue monkey (Cercopithecus mitis).

#### BIRDS:

76 species of birds are recorded for the forests, including three IUCN Red Data Book species; the Plain-backed Sunbird, the Uluguru violet-backed Sunbird and the Southern Banded Snake Eagle.

#### REPTILES:

The Nile Monitor (Varanus niloticus) is present in the riverine forests, and is listed under CITES, Appendix 2. (strictly controlling their exploitation)

11 species recorded for the Genda Genda forests.

#### AMPHIBIANS:

10 species recorded for the Genda Genda forests.

#### FISH:

4 species recorded from 2 rivers/streams in the Genda Genda forests.

2 others recognised as separate species, but could not be caught and therefore identified.

#### INVERTEBRATES:

Large numbers of invertebrates were collected by the Frontier-Tanzania TZ09 expedition and are awaiting identification.

Numbers of the butterfly Bicyclus sp. are very high.

## 2.4 CULTURAL, LAND USE AND SOCIO-ECONOMIC FEATURES

### 2.4.1 COMMERCIAL

Licences issued to two people to carry out logging in Genda Genda South Forest Reserve. It is not known who issues the licences, and for what quality of timber. The two licence holders live in Genda Genda, and only one is carrying out logging (employing 9 people).

The timber is bought by a merchant from Zanzibar who spends half of his time in Genda Genda. He hires a tractor from Mkwaja to tow the logs there, wherefrom it is sent by dhow to Zanzibar.

The logging is currently limited to the forest in the south of Genda Genda South Forest Reserve. The logs are sawn into planks on site in pit saws, and transported by foot to Genda Genda. Although some large clearings have been seen of up to 1 hectare, normally only 1 tree at a time is taken, and the effect on the forest is fairly minimal.

Illegal charcoal burning, firewood collecting, pole cutting, and hunting are carried out by the local village inhabitants in both forest reserves. The effect is most severe in Genda Genda South Forest Reserve, where numerous piles of poles can be seen throughout the forest.

Collecting of fruits, mushrooms, potatoes and honey is carried out mainly in Genda Genda South Forest Reserve. These do not form a large part of the local diet.

About 2km<sup>2</sup> of forest within the Genda Genda South Forest Reserve have been cleared, and planted with crops. This appears to have taken place within the last couple of years.

A couple of herbalists practise in Genda Genda and rely mainly on the forest for their herbs. They are consulted by many of the villagers, as there is neither hospital nor dispensary in the village.

### 2.3.3.2 TOURISM AND RECREATION

Visitors for recreation are rare and no services are provided for them. Visitors have come for the day, in order to climb the hill.

### 2.3.3.3. RELIGIOUS

The inhabitants of Genda Genda village have a graveyard within the Genda Genda South Forest Reserve.

There is a cave on the southern slopes of Genda Genda Hill (ie. within Genda Genda South Forest Reserve), to which the villagers of Genda Genda place much religious significance. It is a ceremonial site, believed to contain spirits responsible for the village. The villagers believe they must be placated when a mishap

befalls the village.

Still-born babies are buried in earthenware pots within the forest.

#### 2.3.3.4 RESEARCH, SURVEY AND MONITORING

Major biological survey of the Genda Genda Forests carried out by the Frontier-Tanzania TZ09 expedition during end July to mid September 1991. Preliminary results are contained in a report available from Frontier at Studio 210, Thames House, 566 Cable Street, London E1, UK.

#### 2.3.5 MAIN CONSERVATION MANAGEMENT ALREADY ACHIEVED

Boundaries cleared and marked 1966. Visit by Catchment Forestry Team 1991.

### 3. EVALUATION

#### 3.1 SIZE

Genda Genda forests are of sufficient size to contain at least 3 distinct coastal forest vegetation communities (see Hawthorne, 1984), along with others not identified by Hawthorne.

The forest comprises a significant percentage of the total area of coastal forests in northern Tanzania, containing 2 of the 7 coastal forest reserves in Tanga Region (approximately 20% of the Coastal Forests by area).

The Genda Genda forests comprise approximately 5% of the total area of coastal forest in Tanzania. In addition most of this forest is in very good condition.

The forest contains globally important communities of African Violet (Saintpaulia sp.), along with 2 rare vegetation communities (Hawthorne, 1984).

#### 3.2 DIVERSITY

A diverse variety of Coastal Forest vegetation communities is present within the forest reserves, and Genda Genda South Forest Reserve contains possibly more Coastal Forest vegetation communities than any other forest of the same size.

#### 3.3 NATURALNESS

Some areas of the coastal forest are a good representation of their natural climax stage of succession. Most of this is little disturbed by human activity.

The areas of grassland and woodland savannah are highly modified by fires and might eventually revert to forest or forest-thicket if protected from burning.

### 3.4 RARITY

One of the 21 known Coastal Forest sites in Tanzania.

The Ludia Diospyros and dry form of Combretum Steruliua forest type vegetation communities are extremely unusual, and not known from other locations (Hawthorne, 1984).

The forests contain the rare African Violet (Saintpaulia sp.).

### 3.5 FRAGILITY

Steep slopes and high rainfall make the site prone to soil erosion if the forest is removed.

Clearance of forest for agriculture, along with felling for timber or charcoal burning would open these areas up to fire. This would prevent any future regeneration of forest on these sites. A large area has already been modified to wood/grassland by fire, and now burns regularly.

In spite of the overall size of the Gendagenda coastal forest, the small size of some of the Coastal forest vegetation communities make them particularly prone to disappearance if the area in which they occur is disturbed. The Forest Thicket vegetation community, as well as the Adansonia-Scorodophleous Forest type are being systematically cleared for agricultural land.

### 3.6 TYPICALNESS

The Gendagenda forests are a classic example of an island of coastal forest, growing on a hill/ridge within a "sea" of drier woodland and savannah, where the topography traps the moist air coming in from the sea.

### 3.7 RECORDED HISTORY

First mention of the Gendagenda hills 1875 by Farler who notes that "on the peak of Tongwe 2000 ft above sea level .....can be seen the southern-most peak of Gendagenda."

Both Gendagenda Forest Reserves were selected and gazetted during the German Administration. Gendagenda South was surveyed in 1910.

Both reserves are identified under Cap 132 of the 1947 Tanganyika Laws. Cap 389 Supp 59 describes the Boundary of Genda Genda South Forest Reserve.

In 1959 both reserves were taken over by the Assistant Conservator of Forests, Tanga. Forest Rangers at the District office in Handeni were told not to patrol the reserves any more.

In 1964 the boundary of Gendagenda South was improved. Two forest rangers were sent to resurvey the area, and new beacons were erected over an 8-10 mile distance.

In 1966 the boundaries of both reserves were maintained, according

to the Forestry Department archives.

In 1991 the NORAD/Catchment Forestry Programme was implemented in both Gendagenda forest reserves.

The human history of the Gendagenda centres around the old village of Tongwe. The presence of this village accounts for the absence of Coastal Forest on the escarpment edge above the village site, as well as on the northern and eastern slopes of the north peak of Gendagenda. The village was moved in 1976 to the new site around the Gendagenda railway station.

To the immediate west of Gendagenda South Forest reserve there was the Mgambo sisal estate owned by Karimjee Jivanjee Estates Ltd. Ownership was transferred to the JKT regiment sometime between 1967 and 1975.

The name Genda Genda has its origin in a foreign (either German or Arabic) word for the hill, describing how it moves, or appears to move because it looks different every time it is seen from a different angle.

A fuller description of the history of Genda Genda is contained in Clarke et al. 1991.

### 3.8 POSITION IN AN ECOLOGICAL UNIT

The Genda Genda Forest Reserves are located within the larger Genda Genda Forests, and are within a few kilometres of another coastal forest at Mgambo to the west.

Although the Mgambo forest will not contain all the various vegetation communities found in the Genda Genda forests, there will be an exchange of birds, butterflies etc.

The Genda Genda Forest Reserves lie 10km to the west of approximately 20km<sup>2</sup> of Cynometra-Maniltara evergreen forest of Msubugue Forest Reserve, and 25 km to the south of further coastal forest of approximately 40km<sup>2</sup> in the Tongue/ Forest Reserves.

### 3.9 POTENTIAL VALUE

#### a) Habitat and Species Management.

Some scope for increasing forest cover by fire prevention and control. Enforced ban on hunting would increase animal numbers.

Prevention of agricultural encroachment and wholesale forest clearance must be a priority. Research in coastal forest dynamics would enable a detailed management programme of the forest resources to be formulated/

#### b) Human Use.

Visitor potential is very high given the close proximity of Genda Genda railway station to the Genda Genda forests. However, clearance from the nearby JKT army base must be obtained before

foreign tourists be allowed onto the site.

Visitor facilities and an information centre would be required to allow visitors to learn about the little-known coastal forests. This centre would add to the appeal of the site.

Better tourist facilities would also be required for foreign visitors. The two hotels in Genda Genda would be considered sub-standard by all except the hardiest!

### 3.10 INTRINSIC APPEAL

Large numbers of the well-known African Violets in their natural setting, combined with the remote yet accessible location provide an appeal for some people.

The impressive Genda Genda hills, with their fine views to Zanzibar, Pemba, Mt Tongue and the Usambara mountains add to the intrinsic appeal.

Genda Genda is a fine example of coastal forest, and contains a large population of colobus monkeys (Colobus sp.). These, and the abundant game in the area, would add to the appeal to people interested in natural history.

### 3.11 OTHER CRITERIA

Both reserves form a necessary part of the Pangani river catchment basin. The Genda Genda South Forest Reserve has been designated a catchment forest under the NORAD/Catchment Forestry programme.

### 3.12 IDENTIFICATION/CONFIRMATION OF IMPORTANT FEATURES

| Site Feature                       | International | National | Regional |
|------------------------------------|---------------|----------|----------|
| <b>1. GEOLOGY/GEOMORPHOLOGY</b>    |               |          |          |
| Sandstone cliff                    |               |          | High     |
| Igneous riverine rocks             |               |          | Medium   |
| <b>2. HABITAT/VEGETATION TYPES</b> |               |          |          |
| Coastal forest                     | Medium        | High     | High     |
| Closed canopy woodland             |               | Medium   | High     |
| Forest-Thicket                     |               | Medium   | High     |
| Savannah                           |               |          | Medium   |
| <b>3. SPECIES</b>                  |               |          |          |
| <u>Plants</u>                      |               |          |          |
| Saintpaulia sp.                    | High          |          |          |
| Milicia excetra                    |               | High     |          |
| Grandidiera boiumi spp             |               |          | High     |
| Euphorbia quadrialata              |               | High     |          |
| Teclea simplifolia                 |               | High     |          |
| Uraniodendron kirkii               |               | Medium   | High     |
| <u>Animals</u>                     |               |          |          |
| Mammals                            |               |          |          |
| Hippotrago niger                   |               | Medium   |          |



|                    |        |
|--------------------|--------|
| Colobus angolensis | Medium |
| Reptiles           |        |
| Varanus niloticus  | Low    |

### 3.13 OPERATIONS LIKELY TO DAMAGE THE SPECIAL FEATURES AND INTERESTS

- a) Illegal clearance of forest for farmland.
- b) Uncontrolled logging of timber trees.
- c) Illegal/uncontrolled removal of poles from forest.
- d) Uncontrolled fires around forest.
- e) Illegal burning of woody matter for charcoal.
- f) Illegal hunting and trapping.
- g) Illegal felling of trees for honey.
- h) Excessive collecting of firewood within the forest.
- i) Possible future army exercises in the forest.

### 3.14 MAIN FEATURES INFLUENCING MANAGEMENT OF THE SITE

- a) Access : Genda Genda is remote and difficult to reach except by train.
- b) Authority : There appears to be some confusion as to which district is actually responsible for patrolling the Genda Genda Reserves. In addition, Genda Genda North Forest Reserve lies in both Handeni and Pangani Districts.
- c) Status : The precise status of the two reserves is also a matter of some confusion between the Forestry Offices at district, regional and national level.
- d) Human : The local inhabitants of Genda Genda and Kwaliwahala need a source of poles and building materials, likely to oppose enforcement of Forest Reserves laws and statutes.

### 3.15 POTENTIAL LAND ACQUISITIONS AND EXTENSIONS

- a) Forest to the north of the Genda Genda Reserves.

The Genda Genda forests continue for about 10km to the north of the northern edge of Genda Genda North Forest Reserve, in a narrow belt of forest along the escarpment edge.

Many seasonal streams arise from this area, which is as important for water catchment as the Genda Genda Reserves. In addition, the large all-year Mkongore river flows through the northern limit of

this forest.

Apart from a few small isolated settlements, this forest is a long way from human habitation and is remarkably free from anthropological disturbance.

This area of forest includes the riverine coastal forest type along all the river valleys emerging from it. Some of these villages contain African Violets.

The recommended areas to be incorporated into the Genda Genda Reserves are displayed on Map \*

b) Forest to the west of the Genda Genda Reserves.

In addition to the forest to the north of the Genda Genda, there is also a further patch of coastal forest about 4 km to the west of Genda Genda South Reserve. From the 1:50,000 East Africa series map (based on aerial photos taken in 1982). The extent of this forest is taken to be 36 km<sup>2</sup>. This forest is unsurveyed and not gazetted, and requires protection. Disturbance appears to be heavy.

#### 4. MANAGEMENT POLICY

4.1 To maintain the current extent and size of the coastal forest habitats, and to ensure that its overall condition does not deteriorate any further.

4.2 To establish a strong and active presence of the Forestry Department to the people of Genda Genda.

4.3 To provide complete protection to the globally important African Violet communities in the Genda Genda forests.

4.4 To combine Genda Genda South and Genda Genda North Forest Reserves, into one large Genda Genda Forest Reserve.

4.5 To enlarge the Genda Genda Reserves to incorporate all adjacent areas of coastal forest not currently within a reserve.

4.6 To prevent fire damage to the forest edges, and in the woodlands surrounding the forests.

4.7 To clear the forest boundaries such that they are unmistakable as such.

4.8 To replant trees in heavily disturbed areas, possibly from a nursery based in Genda Genda. This project could be managed by the DANIDA/National Tree Seedling programme. Indigenous coastal forest trees only to be planted.

4.9 To locate old stumps of muule (Milicia excelsa) and assess for regeneration.

4.10 To give consideration to the provision of services and

facilities for visitors to the reserve. Clearance from the Army will need to be sought before such a programme is implemented.

4.11 To foster and maintain cordial relations with the local inhabitants of Genda Genda village.

4.12 To foster further research, survey and monitoring programmes within the Forest Reserves.

4.13 To create a pole plantation to provide an alternative source of poles for the local inhabitants of Genda Genda. This plantation to be run by the village on a communal basis, along the same lines as their communal farm.

## 5. MANAGEMENT PRESCRIPTIONS AND OPERATIONS

### 5.1 HABITAT AND SPECIES MANAGEMENT

#### 5.1.1 PROTECT SITE BY PATROL:

To patrol sites by Forestry Assistant, stationed permanently at Genda Genda village. Particular attention to be paid to areas near village. Patrolling to be carried out on a continual basis. Assistant not to be local to Genda Genda, for reasons of peer pressure. GH01

#### 5.1.2 REMOVE ILLEGAL AGRICULTURAL ACTIVITY

To evict farmers who have encroached onto Forestry Reserve land. Eviction to be done by other than Forestry Assistant. GH02

#### 5.1.3 PROTECT FOREST FROM FIRE:

To carry out early burning of grassland areas around the forest edge to create a firebreak. Burning to be done in August and January every year, and strictly controlled to prevent the fires getting out of hand. Permanent fire break could serve as reserve boundary. Grassland areas behind the firebreak would be allowed to regenerate. GH03

#### 5.1.4 MONITOR LOGGING:

To ensure that logging activities in the forest area within the limits prescribed by the licence. Forestry Assistant to be responsible for noting number and origin (ie. whereabouts within the forest) of timber extracted from the forest, and to provide quarterly reports to regional level of the extent of this disturbance to the forest. Logging to be for local use only and not to be exported from the village. GH04

#### 5.1.5 DEMARCATÉ BOUNDARY:

To create an unambiguous boundary around the Reserves. Beacons to be built and vegetation cleared around the borders. Contours to be followed and man-made features (railway, road, used where possible). GH05

#### 5.1.6 LIMIT DISTURBANCE

To contain the human use of the forest to the Genda Genda /Kwalewahala residents' own needs. Timber, poles, honey and fuel

woods not to be sold outside the villages. GH06

#### 5.1.7 CREATE REFUGIA

To demarcate zones within the forest in which no disturbance is permitted. This will create refugia for species vulnerable to anthropological interference. These refugia to be in areas of high biodiversity. GH07

#### 5.1.8 REPLANT FOREST TREES

To create a nursery of forest tree species to be replanted within the forest. Negotiation with the Danida/Tree seeding project to be implemented with regard to their involvement in this scheme. GH08

#### 5.1.9 MANAGE CLEARINGS.

To ensure desired hardwood tree species succeed in areas where they have been felled. Liase with loggers to find clearings, and remove competing vegetation. GH09

#### 5.1.10 CREATE CATCHMENT ZONE

### 5.2 VISITORS SERVICES, INTERPRETATION AND EDUCATION.

#### 5.2.1 EDUCATE LOCAL VILLAGERS.

To inform the local people of the national and global importance of the Genda Genda forests, and the long term effects that destruction of the forest would have on the local economy and water supply. Senior ranking Forestry Officers to visit and speak at a village meeting. GE01

#### 5.2.2 INVESTIGATE FUTURE VISITOR POTENTIAL

To begin discussions with the Army with regard to visits by tourists and scientists to the forest. If this is permitted, implement investigation into the requirements and possible income that will be generated from this. An amenity zone should then be designated within the reserve, in which no forest product exploitation will be permitted. GE02

### 5.3 ESTATE SERVICES AND INFRASTRUCTURING

#### 5.3.1 PURCHASE BICYCLE.

To buy a bicycle for use by Forestry Assistant stationed in Genda Genda. Bicycle to be written off over 10 years. Cost 24,000 Tsh or 2,400Tsh per annum. GS01

#### 5.3.2 PURCHASE TOOLS

To buy tools to enable the Forestry Assistant to carry out boundary maintenance. Initial cost of 10,000Tsh. GS02

### 5.4 PUBLIC RELATIONS AND INTERPRETATION,

#### 5.4.1 DETERMINE EXACT STATUS.

To determine the exact status of the Forest Reserves, and to inform all relevant bodies of this (Tanga Region, Pangani and Handeni Districts). Determination and assigning of responsibility to be

carried out at Central Government level. GP01

#### 5.4.2 LIASE WITH NORAD/CATCHMENT FORESTRY

Co-operate with the Catchment Forestry programme with regard to their management of the reserves. GP02

#### 5.4.3 RESERVING BORDERS

To enlarge and incorporate the two Genda Genda Reserves into one large Forest Reserve, to be renamed the Genda Genda Forest Reserve. All areas of forest to be wholly enclosed within the reserve borders. Borders to follow unmistakable features (eg. roads, railway etc. where possible). GP03

### 5.5 RESEARCH/ SURVEY AND MONITORING

#### 5.5.1 COLLECT DATA : BIRDS

To obtain complete species inventory for the Genda Genda forests. Will require visiting ornithologist. GR01

#### 5.5.2 COLLECT DATA : VEGETATION

To carry out further botanical collections (for new species) during the rainy season, as well as during the short dry season. GR02

#### 5.5.3 REPLANTING EXPERIMENT

To set up an experiment to replant forest trees in the disturbed areas of forest from the planned nursery. Experimental design and recording methods to be produced in conjunction with Sokoine University. Likely to require visiting botanist. GR03

### 6. FIVE YEAR WORK PROGRAMME

| PROJECT CODE                                    | WORK DESCRIPTION                   | YEAR |   |   |   |   |
|---|------------------------------------|------|---|---|---|---|
|   |                                    | 1    | 2 | 3 | 4 | 5 |
| Habitat and Species Management                  |                                    |      |   |   |   |   |
| GH01  | Employ Forestry Assistant          | x    | x | x | x | x |
| GH02  | Evict Illegal Farmers              | x    |   |   |   |   |
| GH03  | Carry out early Burning            | x    | x | x | x | x |
| GH04  | Monitor logging                    | x    | x | x | x | x |
| GH05  | Clear Reserve Boundaries           | x    |   |   |   | x |
| GH06  | Contain Disturbance                | x    | x | x | x | x |
| GH07  | Create no Disturbance Areas        |      | x |   |   |   |
| GH08  | Replant Forest Trees               |      |   | x | x | x |
| GH09  | Manage Clearings                   | x    | x | x | x | x |
| Visitors services, Interpretation and Education |                                    |      |   |   |   |   |
| GE01  | Educate village people             | x    |   |   |   |   |
| GE02  | Investigate potential for visitors |      |   | x |   |   |
| Estate Services and Infrastructure              |                                    |      |   |   |   |   |
| GS01  | Buy bicycle                        | x    |   |   |   |   |

|                                     |  |   |   |   |   |
|-------------------------------------|--|---|---|---|---|
| GS02                                | Buy tools                              | x |   |   |   |
| Public Relations and Interpretation |  |   |   |   |   |
| GP01                                | Determine exact status<br>of Reserves  | x |   |   |   |
| GP02                                | Liase with Catchment<br>forestry       | x |   |   |   |
| GP03                                | Redefine & resurvey<br>Forest Reserves |   |   | x |   |
| Research, Survey and Monitoring     |  |   |   |   |   |
| GR01                                | Obtain bird species list               | x |   |   |   |
| GR02                                | Carry out Further Botanical<br>Survey. | x |   |   |   |
| GR03                                | Start Replanting Experiment.           |   | x | x | x |

## 7. APPENDICES

### 7.1 BIBLIOGRAPHY:

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A FEASIBILITY STUDY

G. P. Clarke

February 1992

SUMMARY

The Gendagenda forests comprise some 20km of Coastal Forest on the eastern boundary of Handeni District in Tanzania. The forest is one of only 40 known Coastal Forests (Burgess,1991) in Tanzania, and is unusual for its diversity of vegetation communities (including rare species of flora and fauna); and for being in exceptionally good condition (Dickinson et al. 1992). The forest is close to a railway station on the mainline from Dar es Salaam to Moshi and Tanga.

This report seeks to investigate the commercial feasibility of attracting visitors to Gendagenda, and to determine what facilities would be required to do so.

CONTENTS

1. INVESTIGATION

- 1.1 The Attraction of Gendagenda
- 1.2 Potential Visitors
- 1.3 Facilities Required

2. PROPOSALS

- 2.1 Site for the proposed Visitor's Centre
- 2.2 Size of the proposed Visitor's Centre
- 2.3 Facilities to be offered by the Visitor's Centre.

3. COSTING

- 3.1 Expenses
- 3.2 Expected Income

4. SUMMARY

5. RECOMMENDATIONS

6. APPENDICES

- 6.1 Operating Tourist Facilities in Tanzania
- 6.2 *References*

## 1. INVESTIGATION

### 1.1 The Attraction of Gendagenda

#### 1.1.1 Points of Interest

(a) Forest : Gendagenda is a good example of a Zanzibar-Inhambane Undifferentiated Forest (as defined by F. White in the UNESCO 'Vegetation Types of Africa' document of 1983), hereafter referred to as 'Coastal Forest'. The forest contains a large number of animal and plant species (see Dickinson, Clarke & Matthews, 1992), and is surrounded by a large area of savannah woodland which still contains game animals, though these are rarely seen.

(b) African Violets : Large populations of African Violets (Saintpaulia tongwensis) are present and might provide an attraction to those who are familiar with the popular pot plants.

(c) Colobus : Black and White Colobus (Colobus angolensis polykomos) are plentiful and seem to be used to the presence of humans.

(d) Views : The Gendagenda hills which lie within the reserve, rise to 545m and provide fine views to Zanzibar, Pemba as well as to the Usambara and Nguru mountains.

(e) Access : The attractions are all within easy reach of a railway station.

#### 1.1.2 Similar Points of Interest in the Vicinity of Gendagenda

But the aforementioned attractions also occur elsewhere in Tanga Region :

- |                     |   |
|---------------------|---|
| (a) Forest          | Better (taller and more lush) forest may be found in the Usambara Mountains, although not of the Zanzibar-Inhambane Undifferentiated Forest type.   |
| (b) African Violets | Only 1 species occurs in Gendagenda, whereas 3 species can be found within 4km of Tanga, although locating these may take some time (see Johannson, 1976). 7 species can also be found in the Usambara Mountains. |
| (c) Colobus         | Also present around Pangani Falls Hydroelectric Dam, and in the Usambaras.  |
| (d) Views           | Better views are to be had from the higher Usambara Mountains.  |

From the above list it may be seen that the Usambara Mountains exceed Gendagenda in all areas of interest except :

(a) Access to the Usambaras (e.g. to Amani) is by road only, so for those without their own vehicle it is less convenient than the train, as it means having to change at Muheza rather than being able to journey direct from the major centres of Dar es Salaam, Moshi and Tanga. The road to Amani is also treacherous during the Wet Season.

(b) Coastal forest is not known to be present in the Usambaras,



although the lowland forests there will contain a large number of common species.

### 1.1.3 Discussion

From the previous section, the main user-group likely to be interested in visiting Gendagenda are those with a scientific interest in Coastal Forests and who would not otherwise be able to visit one due to a lack of adequate transport facilities.

## 1.2 Potential Visitors

### (a) Scientists

This group will predominately consist of University students as well as students of biological sciences attending local secondary schools in Korogwe, Muheza or Tanga, who might find an interest in Gendagenda. Support from this group will amount to no more than two weeks per group per year.

Road access to Gendagenda is reasonable when the roads are dry, and some scientists with their own vehicles can be expected, but the total number of scientists working on Coastal Forests is very low.

### (b) Tourists

Budget travellers might also be interested to visit and experience a different side to Tanzania, but the numbers prepared to do this will be very low and will probably not be worth specially catering for (see 3. section COSTING).

The manager of the neighbouring Mkwaja Ranch (owned by the Amboni Group) has submitted proposals to allow game ranching on the estate. Rich tourists would be flown in to stay in purpose-built accomodation on the ranch, and would be offered the chance to visit Gendagenda on a day excursion. These tourists would not need to use the Visitor's Centre, and have therefore been excluded from the costings for it.

## 1.3 Facilities required in Gendagenda

### (a) Accomodation

Visitors to Gendagenda will require basic levels of accomodation, along with water and cooking facilities. These are not currently available in the village.

The facilities will need to be close to both the railway station and the forest, and be accessible by vehicle. A warden would need to be appointed to maintain the place, to be responsible for security, and to ensure an adequate supply of firewood is always available.

### (b) Information

The visitor's centre should contain some information about the natural history of the forest, including maps of paths within the forest.

## 2. PROPOSALS

### 2.1 Site for the Proposed Gendagenda Visitor's Centre

The ideal place for a visitor's centre in Gendagenda is on the site

survey expeditions to the area from July - December 1991. The site offers the following :

- (a) Immediate access to the Gendagenda - Tongwe level crossing road, which then gives onto the Pangani - Kabuku road (metalled road to Dar es Salaam/Moshi/Tanga.
- (b) 5 minutes walk to the village well.
- (c) 15 minutes walk to the Gendagenda forest.
- (d) 25 minutes walk to Gendagenda village and railway station.
- (e) 50 minutes walk to the African Violets site.

In addition the site lies outside the village, offering plenty of space and privacy. It is surrounded by a large area of woodland, from which firewood would be available.

## 2.2 Size of the proposed Visitor's Centre

The Visitor's Centre should be large enough to accomodate school/university groups (which have been identified as the main potential market) of up to 20 individuals. Camping space should also be made available for larger groups.

## 2.3 Facilities to be offered by the Visitors's Centre

The costs of providing facilities to visitors should be kept to a minimum, as cost is more important than comfort for the main identified user-group.

The Visitor's Centre should be built from materials available locally, i.e. in the form of a wattle-and-daub house, built along traditional lines. The house should include a firewood store and a kitchen/cooking area.

Washing facilities and a toilet should also be made available, as well as buckets for collecting the water and lamps for light at night.

## 3. COSTING

### 3.1 Expenses

- (a) To build the house.

House to have minimum dimensions of 3m x 50m

Materials : Poles from forest, clay, coconut 'makruti' thatch

Labour : 40 man days @ 800 /- per man day

= 8,000 /-

TOTAL = 8,000 /-

Depreciate over 10 years

= 800 /- per annum

- (b) Equipment

4 buckets @ 1200 /-

= 4,800 /-

2 Copies of Frontier Gendagenda

|  |                                    |
|--|------------------------------------|
| (Approximately 200 pages)  | = 8,000 /-                         |
| 2 Pangas (for firewood) @ 450 /-   | = 900 /-                           |
| 2 Kerosene Hurricane Lamps @ 3100 /-                                     | = 6,200 /-                         |
|  | TOTAL =19,900 /-                   |
| Depreciate over 3 years  | = <u>6,633 /-</u> per annum        |
| (c) Running Costs  |                                    |
| 1 Warden @ 150 /- per day  | = 53,400 /- per annum              |
| Kerosene for lamps @ 1.5 litres/week<br>@ 200 /- per litre (local price) | = 15,600 /- per annum              |
|  | TOTAL = <u>69,000 /-</u> per annum |

[A light will need to be on at all times as visitors will be arriving by night if coming by train]

**TOTAL COST PER ANNUM = 76,433 /-**

### 3.2 Expected Income

|   |                          |
|---|--------------------------|
| 5 school / university groups of 30 for<br>1 week paying 50 /- per night/student | = 52,500 /-              |
| 20 'travellers' for 2 nights paying<br>100/- per night                          | = 4,500 /-               |
| <b>TOTAL INCOME</b>   | <b>= 56,000 /-</b>       |
| <b>LESS TOTAL COSTS</b>   | <b>= 76,433 /-</b>       |
|   | <b><u>-20,067 /-</u></b> |

The centre would make a loss.

Number of travellers required to break even :

|   |                                  |
|---|----------------------------------|
| Income from schools/colleges  | = 52,500 /-                      |
| <u>Less</u> Total costs   | = 76,433 /-                      |
|   | <b><u>-23,933 /-</u></b>         |
| <b>No. of travellers required paying<br/>100 /- per day, staying for 2 days</b> | <b><u>23,933</u><br/>100 x 2</b> |
|   | <b>= 120</b>                     |

### 4. SUMMARY

A visitor's centre with the basic facilities (where costs are kept to the absolute minimum) would be unable to pay for itself at Gendagenda. The projected forecast for the number of school/college visits are optimistic and account for the bulk of the expected income. Lack of support from these groups will seriously undermine

Foreign tourist numbers will be low unless high profile publicity is given to Gendagenda (which would involve placing posters at the favourite travellers haunts at Moshi and Dar es Salaam. However, traveller numbers on the Dar es Salaam - Moshi/Tanga line average about 10, which would be the absolute maximum number that could be expected. Assuming all stop at Gendagenda for two nights, and the train stops 6 nights per week at Gendagenda :

10 people for 2 nights over 312 days  
@ 100 /- per night =624,000 /-

The visitor's centre could then pay for itself, even if just 1/9 of the potential number of travellers stops at Gendagenda. But the reality is that a large proportion of the travellers using the train journey in both directions, thus halving the potential numbers. And as the nearby Sadaani Game Reserve has difficulties in attracting more than 20 foreigners per month (240/year) it is unlikely that Gendagenda will exceed that, in spite of its better rail communications.

## 5. RECOMMENDATIONS

An education/visitor's centre in Gendagenda is not viable as a self supporting project. However, the amount required to pay for the running of such a centre is very small in Western terms (76,000 /- equating to about £200 or US\$350).

Foreign funding over a period of at least five years should be sought if this project is to be implemented. The benefits associated with attracting visitors to Gendagenda would not only be financial; they would increase local awareness of the importance of the forest and might discourage excessive over-exploitation. On such grounds alone, the cost of financing a Visitor's Centre would make an important contribution to preserving the forest.

## 6. APPENDICES

### 6.1 Operating Tourist Facilities in Tanzania

For foreign organisations to operate tourist facilities in Tanzania, a license is required from the Minister of Tourism.

The Tanzanian Tourist Corporation is to be scrapped by June 1992, to be replaced by the Tanzanian Tourist Board. The TTB will take over and be responsible for advertising and publicity, and will carry this out free of charge on behalf of the tourist facilities in the country.

### 6.2 References

Burgess, N.

VEGETATION OF GENDAGENDA

The Gendagenda forests are located about 5'32"S, 38'38"E on the eastern edge of Handeni District in Tanzania. They cover some 20 square kilometres, stretching 17 km along the edge of a 200m escarpment, rising from the coastal plain at 100m. Six distinct forests types are present :

## a) The Gendagenda Hills

The twin peaks of the Gendagenda hills rise to 545m and 500m respectively and are entirely cloaked with forest except for the north-eastern edge of the northern peak. The canopy height varies between 15m and 20m, with occasional to scattered 25m emergents of Sterculia appendiculata and Afzelia quanzensis, both of which are deciduous. The main canopy is evergreen and dominated by Craibia brevicaudata, Combretum schumannii, Lecaniodiscus fraxinifolius, Diospyros brucei and Scorodophloeus fischerii. Understorey vegetation varies from sparse to absent, with visibility in parts of the forest reaching 150m.

## b) Eastern base of the Gendagenda Hills

Below 200m, the forest becomes floristically poorer than higher up, and dominance shifts to Scorodophloeus fischerii, Croton jatrophioides, Balanites aegyptiaca, and more occasionally Manilkara sulcata, with Adansonia digitata evenly scattered throughout. Canopy height averages 15m with individuals rising to 20m. Understorey vegetation varies from a dense to sparse 2m shrub layer.

## c) South of the Gendagenda Hills

Forest continues for 3km south of the Gendagenda hills and is dominated by Combretum schumannii, Scorodophloeus fischerii, Manilkara sulcata, and Lecaniodiscus fraxinifolius. Canopy height varies from 25m in the river valleys to 15m on the escarpment ridge tops. Understorey vegetation is predominantly a very dense 2m high shrub layer, although this was locally absent in the vicinity of Strychnos henningsii.

## d) North of the Gendagenda Hills

2km north of the Gendagenda hills a thin strip of forest 1km wide continues for 10 km along the escarpment edge, strongly dominated by Cynometra sp. aff alexandri (though possibly C. sp. A or B of FTEA). Canopy height averages 12m with emergents to 30m. The understorey consists almost entirely of scattered 2m saplings of Cynometra sp. and localised Euphorbia sp. Visibility is typically 100m.

## e) Moist riverines north of Gendagenda.

A number of rivers flow east through the Cynometra sp. forest to the north of the Gendagenda hills. Two of these are seasonal but contain permanent water, and run through steep sided valleys. The permanent Mkongore River flows through the northern end of the forest. Riverine forest is well-developed to about 70m either side of these watercourses and is dominated by Scorodophloeus fischerii, Sorindea sp., Ficus spp. and Julbernardia magnistipulata, with scattered Pandanus sp. and Milicia excelsa. Canopy height varies from 20m to 35m, with an understorey tree canopy at 12m. Shrubs are sparse except on the river banks.

## f) Thicket forest

Dense thicket forest occurs on the margins of the forests around and to the south of the Gendagenda Hills, particularly to the east and north-east. This comprises a 10m canopy dominated by Grewia holstii, Dobera loranthifolia, with scattered 15m emergents of Lecaniodiscus fraxinifolius, Combretum schumannii, and Adansonia digitata. The understorey is a dense tangle of lianas.

1REPORT OF THE SOCIO-ECONOMIC SURVEY CONDUCTED IN GENDAGENDA  
JULY - AUGUST 1991

G.P. Clarke, F. Tarimo, C. Gilliam, A. Malkin & R. Gooday

SUMMARY

To determine the influence of the local population on the Gendagenda North and Gendagenda South Forest Reserves, seven people from the neighbouring village were interviewed over a six week period during the Frontier TZ09 expedition to the area (see Dickinson, Clarke & Matthews, 1991).

Gendagenda village was founded in 1976 as a result of the Ujamaa villagisation programme. A number of small and remote communities on the eastern border of Handeni District were combined and moved to a new village site below the scarp edge of the Gendagenda hills, adjacent to the southern edge of the Gendagenda South Forest Reserve.

The relocation of the villages has concentrated the disturbance and threat to the Gendagenda Forest to the areas around the present day settlement, whilst leaving the remainder of the forest little disturbed. Much encroachment is currently taking place into forest which may be unique to Tanzania in terms of its condition as well as the vegetation communities present. The village people are also exploiting the forest for poles, firewood and timber for building.

Gendagenda is surrounded by a large area rich in game animals, which are being hunted at the rate of one per day. Along with the forest exploitation, illegal activities contribute a significant portion of the local economy.

CONTENTS

1. Background
2. Description
3. History
4. Villagisation
5. Farming
6. Forest Exploitation
7. Hunting
8. Village Infrastructure
9. Spiritual Significance of the Forest
10. Bibliography

## APPENDIX : Interview Summaries

1. BACKGROUND

A social economic survey was conducted in the village of Gendagenda to assess the impact of the community on the two neighbouring forest reserves. Particular attention was paid to the economic importance of the forest, trends in its exploitation, and the value placed by the local people on the forest.

Questions were asked on a variety of issues, which allowed detailed questions regarding the exploitation of the forest to be raised without making obvious the intention of the survey.

Some map work was carried out to provide a detailed record of the size and layout of the village at the time of study.

Permission to carry out interviews was initially sought with the Chairman of the Gendagenda CCM (Chama cha Mapinduzi), who provided the names of seven people who were considered reliable and would therefore give accurate and unbiased information.

A local herbalist was also being consulted at the time for identifications of plant specimens collected for the University of Dar es Salaam Herbarium. She was able to add further information with regard to the use of forest products for medicinal purposes.

A standard questionnaire was produced although this was not strictly adhered to, as it might have broken a good conversation flow and might also have given the subjects the impression of being interrogated rather than being interviewed.

Interviews were conducted in the subjects' homes, thus enabling them to talk freely and without peer pressure.

2. DESCRIPTION

The forests and village of Gendagenda lie some 160km to the north-north-west of Dar es Salaam, 35km inland of the coast. They are administered by Handeni, although there appears to be some disagreement over whether the village lies entirely within Handeni District, or whether it is partly included in Pangani District.

The village is situated on the coastal plain at 110m altitude, below the scarp edge of the Gendagenda hills, which rise to 545m. Forest of the Zanzibar-Inhambane Undifferentiated Forest type (F. White, 1983) is present along most of the escarpment edge. Part of this is protected by the Gendagenda North and Gendagenda South Forest Reserves. A number of seasonal and one permanent river flow off the escarpment and form part of the Pangani River catchment area.

The current population of Gendagenda stands at 1,773 (843 males,



930 females), of which 935 are children under the age of sixteen. The coastal plain to the east is largely uninhabited and still contains large quantities of game.

### 3. HISTORY

The origin of the name Gendagenda is obscure, being derived from the foreign word. Some say that it is German, and is a local corruption of a word spoken by the Germans when they mounted an expedition to climb the peak. Others say that it is Arabic, and means that the mountain looks different depending on which way that you look at it.

The area around Gendagenda is dominated by the Samwetongwe clan of the Wasigua tribe, who originally settled in the former village of Tongwe, 5 km to the north of the present village of Gendagenda.

### 4. VILLAGISATION

Cornerstone to the Arusha Declaration of 1967 was the Ujamaa village - a collective agricultural venture run along traditional African lines. Scattered villages were amalgamated into larger villages (requiring inevitable resettlement), to be provided with potable water, schools and medical facilities. In this way the country's scarce resources could be made available to everyone, and administration of the land made easier.

On the 1st of March 1976, the District Commissioner gathered together the people of the five villages of Tongwe, Kwagongo, Kwediwawala, Kwalukuta and Majengo. A new site was elected at Gendagenda, which was previously uninhabited. The villages moved in September 1976, with the exception of the people of Kwediwawala, who refused to go.

### 5. FARMING

Before Villagisation the inhabitants of the Gendagenda area lived in small scattered villages from which each was able to hunt the abundant game in the area. Some crops were also grown at this time, and fruits and vegetables were gathered from the bushland.

After villagisation the previously scattered population was concentrated in a small area, making hunting less viable in the immediate vicinity of the new and larger village. As a result, Gendagenda has become a predominantly a farming community; the villagers grow all their own food and have taken advantage of the excellent transport facilities offered by the railway to grow cash crops for export to Dar es Salaam.

Under the Villagisation programme, a communal farm was set up for the production of cash crops. The size of this farm has fluctuated from a minimum of 26 hectares in 1986 to a peak of 100 hectares in 1989 [Note: this information was impossible to substantiate as

termites had eaten the village records]. The fluctuation reflects the varying rainfall and growing season for the crops, from cotton requiring a long season during the late 1980s to maize from 1990. The villagers described a noticeable reduction in annual rainfall over that period.

| <u>Year</u> | <u>Size of Farm</u> | <u>Crop</u> | <u>Yeild</u> |
|-------------|---------------------|-------------|--------------|
| 1978        | 42 hectares         | Cotton      | 25 tons      |
| 1979        | 42 hectares         | Cotton      | 14 tons      |

The communal farm was abandoned in 1991, due to complaints that the money earned from the cash crops was not reaching the village. There was no incentive to continue with the programme, although the village chairman does plan to resume with the scheme for 1992.

Every family in the village has their own plot of land on which they grow enough to feed themselves. Subsistence crops include maize, yams (sweet potatoes), cassava, plantains, pumpkins and 'mchicha'. Oranges, coconuts, maize and cotton are also grown for export to the nearby National Service (JKT) base, to Korogwe and to Dar es Salaam.

Each family is allocated enough land to be able to grow enough food to survive. Sites bordering, or even within the forest appear to be preferred, even though there is abundant land elsewhere. Encroachment into the forest is progressing at a rapid rate, even within Gendagenda South Forest Reserve, where 1 km has been cleared inside the forest. At least 6 km of forest have been cleared between the villages of Gendagenda and Kwedihwawala.

Output from the land is very variable :

| <u>Interviewee No</u> | <u>Farm Size (hec)</u> | <u>Crop Type</u> | <u>Output</u> |
|-----------------------|------------------------|------------------|---------------|
| 1                     | 3                      | Maize            | 80 bags       |
| 2                     | 4                      | Maize            | 60 bags       |
| 3                     | 4                      | Maize            | 40 bags       |
| 4                     | 3                      | Maize            | 40 bags       |
| 5                     | 4                      | Coconuts         | 9 tons        |
| 6                     | 2                      | Maize            | 30 bags       |

The land is owned centrally by the village. Villagers complained of a lack of incentive to invest in their land as they were unsure about how long they would be guaranteed tenure. The plots or 'shambas' are often located far from the villager's homes.

Goats, ducks and chickens are the only livestock kept.

## 6. FOREST EXPLOITATION

Two villagers are licensed to fell trees within the reserve, although the District Forestry Officers of both Pangani and Handeni were unaware that these licenses had been issued. Only one of the two license holders is actively logging in the forest, and employs

six people. Planks from the logged trees are on sale for half the Dar es Salaam prices (1000/- for 12'x1'x1").

All the villagers use the forest as a source of straight poles for building, and an average of 16% of poles with a diameter of between 3 and 10 cm have been cut.

Firewood is collected from the forest, as well as from the surrounding bushland. Some of the firewood is sent by train to Dar es Salaam. No charcoal production was seen, as the villagers do not possess charcoal-burning stoves.

Fruits are collected from the following forest plants :-

|                               |             |              |
|-------------------------------|-------------|--------------|
| <u>Croton sylvaticus</u>      | 'Mkogho'    |              |
| <u>Phaseolus lunatus</u>      | 'Mghobe'    |              |
| <u>Phyllanthus guineensis</u> | 'Mkwamba'   |              |
| <u>Manilkara sulcata</u>      | 'Msezi'     |              |
| <u>Sorindeia obtusifolia</u>  | 'Mkwingina' | (wild mango) |
| <u>Dioscorea dumetorum</u>    | 'Ndiga'     | (wild yams)  |

Trees are cut down in order to obtain honey, particularly Dombeya gigantea, which has holes in which the bees live. The local people believe that the honey is ready when the tree flowers.

## 7. HUNTING

Game is still fairly abundant in the uninhabited bushland and savannah areas to the east of Gendagenda, including buffalo, waterbuck, impala, sable antelope, kudu as well as the occasional giraffe and elephant. At least one game animal per day is shot by the villagers of Gendagenda (an average of three shots could be heard per day by the study team whilst staying in the village).

Snares are set for smaller animals, including the cane rat and porcupines.

The hunters earn much money from the hunting, and can sell the meat for 100/- per kilo. Thus a mature buffalo weighing 700kg with 500kg of meat will fetch 50,000/-; a gazelle weighing 300kg with 200kg of meat will fetch 20,000/-.

As well as the meat, fats are obtained from the animals and used as cooking oil.

## 8. VILLAGE INFRASTRUCTURE

Gendagenda has 3 shops, 3 chai-huts and no market for selling produce.

### 8.1 Healthcare

No modern healthcare facilities are present in the village, and the

people must rely on the three traditional herbalists. The nearest public hospital is in Korogwe, 35 km to the north, and a military hospital is present at the JKT army camp, which is sometimes used by the villagers.

The herbalists rely predominantly on medicinal plants from the bushland rather than from the forest, possibly reflecting the origins of the pre-villagisation communities. Malaria, measles and elephantitis are the most serious diseases in the village.

### 8.2 Water

Fresh water is brought by tanker for the railway workers at Gendagenda and Tongwe.

The nearest permanent river to Gendagenda village is the Mkongore River, 15km to the north. The high precipitation on the hills and escarpment disappears into the ground, due possibly to permeable rock, and reappears as groundwater. The villages rely on the three wells; at Tongwe, Majengo (slightly saline) and Gendagenda.

### 8.3 Education

A primary school was founded in Gendagenda when the village was formed in 1976. The first standard seven leaver graduated in 1983, but no pupil has ever qualified to join secondary school.

Attendance at the school is poor, only 12 - 15 attend out of a roll-list of 205. There are only 3 teachers to teach 7 streams, and illiteracy is high.

The village has one university graduate, who was schooled in Pangani and now works for Air Tanzania in Dar es Salaam.

## 9. SPIRITUAL SIGNIFICANCE OF THE FOREST

## 10. BIBLIOGRAPHY

Dickinson, A, Clarke, G.P., Matthews, P.D.; "Preliminary surveys in the Gendagenda Forest Reserves, July to December 1991", The Society for Environmental Exploitation.



COLUBRIDAE

|     |  |  |       |       |
|-----|--|--|-------|-------|
|     | <u>Philothamnus semivariega</u>        |  | C/F/1 | (W)   |
|     | <u>Philothamnus</u> sp                 |  | C/F   |       |
| (L) | <u>Thelotornis capensis</u> Twig snake |  |       | C/F/1 |
|     | <u>Meizodon semiornatus</u>            |  | C/W/1 | (W)   |
|     | <u>Lycodonomorphus</u> sp              |  | O/F/1 |       |
|     | <u>Crotaphopeltis hotamboeia</u>       |  | C/W/1 | (W)   |
|     | <u>Dispholidus typus</u>               |  | C/W/1 | (W)   |
|     | <u>Atractaspis</u> sp                  |  | O/W/1 |       |

BOIDAE

|  |   |  |       |     |
|--|---|--|-------|-----|
|  | <u>Python sebae</u> African rock python |  | O/F/1 | (W) |
|--|---|--|-------|-----|

(LIZARDS)GEKKONIDAE

|  |   |  |       |     |
|--|---|--|-------|-----|
|  | <u>Hemidactylus platycephalus</u> Flat-headed house gecko |  | C/F/3 | (W) |
|  | <u>Hemidactylus mabouia</u> Tropical house gecko          |  | C/F/3 | (W) |
|  | <u>Lygodactylus luteopicturatus</u>                       |  | C/W/3 | (L) |
|  | <u>Lygodactylus capensis groteti</u>                      |  | C/W/1 | (L) |
|  | <u>Lygodactylus cf howelli</u>                            |  | C/W/1 |     |
|  | <u>Lygodactylus</u> sp                                    |  | C/F/2 |     |

SCINCIDAE

|     |   |  |        |     |
|-----|---|--|--------|-----|
| (W) | <u>Mabuya maculilabris maculilabris</u> Speckled lipped skink |  | C/FW/3 |     |
|     | <u>Mabuya striata striata</u> Striped skink                   |  | C/W/2  | (W) |
|     | <u>Panaspis wahlbergii</u> Snake-eyed skink                   |  | C/W/1  | (W) |
|     | <u>cf Leptosiphos (perretia) rhomboidalis</u>                 |  | C/F/1  | (L) |

CORDYLIDAE

|  |   |  |       |     |
|--|---|--|-------|-----|
|  | <u>Gerrhosaurus cf major</u> Greater plated lizard      |  | C/W/1 | (W) |
|  | <u>Gerrhosaurus nigrolineatus</u> Striped plated lizard |  | C/F/1 | (W) |

AGAMIDAE

|  |                       |  |       |     |
|--|-----------------------|--|-------|-----|
|  | <u>Agama aculeata</u> |  | O/W/2 | (L) |
|--|-----------------------|--|-------|-----|

VARANIDAE

|     |                                       |  |  |        |
|-----|---------------------------------------|--|--|--------|
| (W) | <u>Varanus niloticus</u> Nile monitor |  |  | O/FW/3 |
|-----|---------------------------------------|--|--|--------|

TESTUDINADAE

|  |  |  |       |     |
|--|--|--|-------|-----|
|  | <u>Kinixys belliana</u> Bell's hinged tortoise |  | O/F/1 | (L) |
|--|--|--|-------|-----|

PELOMADUSIDAE

|  |                    |  |       |  |
|--|--------------------|--|-------|--|
|  | <u>Pelusios</u> sp |  | O/F/2 |  |
|--|--------------------|--|-------|--|

CHAMAELEONIDAE

|       |   |  |       |     |
|-------|---|--|-------|-----|
|       | <u>Chamaeleo dilepsis</u> Flap-neck chameleon                   |  | O/W/2 | (W) |
| C/W/1 | <u>Rhampholeon kerstenii kerstenii</u> Kersten's leaf chameleon |  |       | (L) |

(SHREWS)  
SORICIDAE

Crocidura sp C/FW/2

MACROSCELIDIDAE

(L) Rhynchocyon petersi Black and rufous elephant shrew O/F/2  
Petrodomus tetradactylus Four toed elephant shrew O/F/2 (W)

(BATS)

MEGACHIROPTERA

PTEROPIDAE

(W) Epomoporous wahlbergi Wahlberg's epauleted bat C/F/3  
Epomoporous sp C/F  
Myonycteris relicta Greater collared bat C/F/1 (L)

MICROCHIRPOTERA

HIPPOSIDERIDERIDAE

Hipposideros caffer C/F/2 (W)  
Hipposideros ruber C/F/3 (W)  
Hipposideros commersoni Commerson's bat C/F/1 (W)  
Trianops persicus afer Persian leaf-nosed bat C/F/2 (L)

VESPERTILIONIDAE

Pipistrellus manus Banana bat C/F/2 (W)  
Scotophilus viridis Lesser yellow house bat C/F/3 (W)  
Myotis bocagei C/F/1 (W)  
Glaucomycteris variegata Butterfly bat C/F/1 (W)  
Keriubula sp Woolly bat C/F/1

MOLLOSSIDAE

Tadarida sp C/F/1

NYCTERIDAE

(L) Nycteris cf macrotis Large-eared slit faced bat C/FW/2  
(L) Nycteris grandis Greater slit faced bat C/F/2

(RODENTS)

SCIURIDAE

(W) cf Heliosciurus rufobrachium Red-legged sun squirrel O/F/1  
Paraxeris palliatus Red-bellied coast squirrel O/F/2 (L)

HYSTRICIDAE

Hystrix sp Porcupine O/F/1

MURIDAE

Grammomys sp Narrow footed thicket rat C/F/1

CRICETIDAE

Cricetomys cf gambianus Giant gambian pouched rat C/F/1  
(W)

MUSCARINIDAE

Graphiurus murinus African dormouse C/F/1 (W)

THRYONOMYIDAE

Thryonomys swinderianus Marsh cane rat C/FW/2 (W)

(CARNIVORES)VIVERRIDAE

Viverra zibetha Civet cat O/W/1 (W)  
Genetta genetta Genet O/F/1 (W)  
(W) Helogale parvula Dwarf mongoose O/W/1  
(W) Herpestes sanguines Slender mongoose O/F/1

(PHOLIDOTA)MANIDAE

Manis Temminck's ground pangolin O/W/1 (W)

(PRIMATES)CERCOPITHECIDAE

Papio cynocephalus Yellow baboon O/FW/3 (W)  
Cercopithecus albogularis Sykes' monkey O/F/2 (L)  
Cercopithecus pygerythrus Vervet O/FW/2 (L)  
Colobus angolensis palliatus Tanzanian black and white  
colobus O/F/3 (L)

LORISIDAE

Galago sp Garnett's bushbaby O/W/3  
Zanzibar bushbaby

(ARTIODACTYLES)SUIDAE

Potamochoerus porcus Bush pig O/FW/2 (W)  
Phacochoerus aethiopicus Wart hog O/W/2 (W)

BOUIDAE

Cephalophus natalensis Red duiker O/FW/2 (L)  
Raphicerus melanotis O/F/1 (W)



APPENDIX 2

GENDA GENDA\*\*\*\*\*

LEPIDOPTERAPAPILIONIDAE

Papilo constanbrus  
Papilo ophidicephalus  
Papilo demodocus  
Papilo dardanus  
Graphium loenidas

PIEIIDAE

Belenois thysa  
Belenois creona  
Belenois victoria  
Cutopsila florella  
Colobis antevippe  
Colobis equipe  
Colobis ione  
Eronia leda  
Eurema regularis  
Eurema hapale  
Mylothas rubricosta  
Nepheronia thalassina  
Ypthimna pupillaris

NYMPHALAIDAE (NYMPHALIDS, ACRAEA, PANAIIDS)

Acraea sp 9 unidentified  
Amauris ochlea  
Aterica ganune  
Byblia acheloia  
Charaxes brubus  
Charaxes ethalion  
Charaxes lasti  
Charaxes paphianus  
Charaxes varanes (definite visual identification only)  
Cymothoe sp  
Danaus chrysippus  
Euphaedra neophron nr. neophron  
Eudphaedra alacris  
Hananumida daeddalis  
Hypolimnas dubious  
Neptis penningtoni (or bueta)  
Neptis carcassoni (or possibly melicerta)  
Neptis sp (possibly N.ochrecea)  
Precis oneone  
Pseudacraea boiduvala  
Pseudarynnis sp (possibly P.hegemone)  
Siclamis sp

1 unidentified possibly Argynnis

SALYNDAE

Bicyclus sp

Henica ubenica

Physcaneura sp

Ypthimna antennata

2 unidentified Satyrid species

LYCAENIDAE

Axioceres tjoane

Leptotes jeaneli

1 unidentified possibly Penbla or Bachioch

1 unidentified

HESPERIIDAE

3 unidentified species

APPENDIX 6BIRDS OF NORTH AND SOUTH GENDA GENDA FOREST RESERVE

C. Milingwa (M.Sc.)

A survey of the avifauna of North and South Gendagenda Forest Reserve was made from 29 November 1991 to 9 December 1991, as part of the Frontier Tanzania project sponsored by the Society for Environmental Exploration (London). Due to logistical problems and a short survey period, it was not possible to carry out substantial mistnetting work. Instead, time was spent on intensive daily observations of birds in various sections of the forest area. Identification of species was based mainly on visual observations. In addition, many birds were calling or were in song to be able to identify them from their specific calls and songs.

The following is a list of birds recorded in the forest interior, forest edge or flying over the forest. Order and nomenclature of species follow Britton (1980). Detailed account of the avifauna and the conservation importance of Gendagenda forest to coastal forest birds will be published elsewhere (Milingwa in prep.).

ACCIPITRIDAE

1. Gypoherax angolensis (Palm-nut Vulture)
2. Circaetus fasciolatus (Southern Banded Snake-eagle)
3. Accipiter minullus (Little Sparrowhawk)
4. A.tachiro (African Goshawk)
5. Lophaetus occipitalis (Long-crested Eagle)
6. Stephanoetus coronatus (Crowned Eagle)

NUMIDIDAE

- 7 . Guttera pucherani (Kenya Crested Guinea fowl)

COLUMBIDAE

8. Turtur chalcospilos (Emerald-spotted Wood Dove)
9. t. tympanistris (Tamourine Dove)

MUSOPHAGIDAE

10. Tauraco fischeri (Fischer's Turaco)

CUCULIDAE

11. Cercococcyx montanus (Barred Long-tailed Cuckoo)
12. Chrysococcyx caprius (Didric Cuckoo)
13. C. klaas (Klaas Cuckoo)
14. Clamator jacobinus (Black and White Cuckoo)
15. Ceuthmochares aereus (Yellowbill)
16. Centropus superciliosus (White-browed Coucal)

STRIGIDAE

17. Ciccaba woodfordii (African Wood Owl)

CAPRIMULGIDAE

18. Caprimulgus pectoralis (Fiery-necked Nightjar)

APODIDAE

19. Cypsiurus parvus (Palm Swift)

COLIDAE

20. Colius striatus (Speckled Mousebird)
21. Urocolius mocrourus (Blue-naped Mousebird)

TROGONIDAE

22. Apaloderma narina (Narina's Trogon)

ALCEDINIDAE

23. Halcyon albiventris (Brown-hooded Kingfisher)
24. Ispidina picta (Pygmy Kingfisher)

MEROPODAE

25. Merops albicollis (White-throated Bee-eater)

PHOENICULIDAE

26. Phoeniculus cyanomelas (Scimitarbill)
27. P. purpureus (Green Wood Hoopoe)

BUCEROTIDAE

28. Bycanistes bucinator (Trumpeter Hornbill)
29. Tockus alboterminatus (Crowned Hornbill)

CAPITONIDAE

30. Buccanodon leucotis (White-eared Barbet)
31. Lybius lacrymosus (Spotted-flanked Barbet)
32. L. torquatus (Black-collared Barbet)
33. Pogoniulus bilineatus (Yellow-rumped tinkerbird)
34. P. simplex (Green Tinkerbird)

INDICATORIDAE

35. Indicator minor (Lesser Honeyguide)
36. I. variegatus (Scaly-throated Honeyguide)

PICIDAE

37. Campethra cailliautii (Little Spotted Woodpecker)

EURLAMIDAE

38. Smithornis capensis (African Broadbill)

HIRUNDINIDAE

39. Psalidoprocne prisoptera (Black Roughwing)

DICRURIDAE

40. Dicrurus ludwigii (Square-tailed Drongo)

ORNIOLIDAE

41. Oriolus auratus (African Golden Oriole)

PYCNONOTIDAE

42. Chlorocichla flaviventris (Yellow-bellied Greenbul)
43. Nicator chloris (Nicator)
44. Phyllastrephus debilis (Tiny Greenbul)
45. P. fischeri (Fischer's Greenbul)
46. P. flavostriatus
47. P. terrestris (Brownbul)
48. Pynonotus barbatus (Common Bulbul)

TURDIDAE

49. Cercotrichas quadrivirgata (Eastern Bearded Scrub Robin)
50. Cossypha natalensis (Red-capped Robin Chat)
51. Neocossyphus rufus (Red-tailed Ant Thrush)

SYLVIIDAE

52. Apalis melanocephala (Black-headed Apalis)
53. Cameroptera brachyura (Grey-headed Cameroptera)
54. Macrospherus kretschmeri (Kretschmer's Longbill)

MUSCICAPIDAE

55. Batis mixta (Forest batis)
56. B. molitor (Chin-spot Batis)

57. Erythrocerus holochlorus (Little Yellow Flycatcher)  
 58. Terpsiphone viridis (Paradise Flycatcher)  
 59. Trochocercus cyanomelas (Crested Flycatcher)

MOTACILLIDAE

60. Mottacilla clara (Mountain Wagtail)

MALACONOTIDAE

61. Dryoscopus cubla (Black-backed Puffback)  
 62. Laniarius ferrugineus (Tropical Boubou)  
 63. Malaconotus quadricolor (Four-coloured Bush Shrike)

PRIONOPIDAE

64. Prionops scopifrons (Chestnut-fronted Helmet Shrike)

STURNIDAE

65. Lamprotornis corruscus (Black-breasted Glossy Starling)

NECTARINIIDAE

66. Anthreptes collaris (Collared Sunbird)  
 67. A. neglectus (Uluguru Violet-backed Sunbird) RED DATA BOOK  
 68. A. reichenowi (Plain-backed Sunbird) RED DATA BOOK  
 69. Nectarinia olivacea (Olive Sunbird)

PLOCEIDAE

70. Amylospiza albifrons (Grosbeak Weaver)  
 71. Ploceus bicolor (Dark-backed Weaver)  
 72. P. cucullatus (Black-headed Weaver)

ESTRILDIDAE

73. Estrilda astrild (Waxbill)  
 74. Hypargos niveoguttatus (Peters' Twinspot)  
 75. Mandingoa nitidula (Green-backed Twinspot)  
 76. Lonchura cucullata (Bronze Mannikin)

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APPENDIX 7STUDY OF TANZANIAN COASTAL FORESTS: BATSINVENTORY OF THE GENDAGENDA FORESTMICHEAL SMITH

| PAGE | CONTENT                                    |
|------|--|
| 1    | ABSTRACT, INTRODUCTION, FOREST DESCRIPTION |
| 2    | BAT NETTING SITES                          |
| 4    | METHODOLOGY                                |
| 7    | SPECIMENS COLLECTED                        |
| 8    | THE BAT SPECIES FROM GENDAGENDA FORESTS    |
| 11   | SPECIES BREAKDOWN                          |
|      | SUBORDER BREAKDOWN TZ09 (PIE CHARTS)       |
| 12   | SPECIES BREAKDOWN                          |
|      | SUBORDER BREAKDOWN TZ10 (PIE CHARTS)       |
| 13   | SPECIES BREAKDOWN                          |
|      | SUBORDER BREAKDOWN TZ09/TZ10 (PIE CHARTS)  |
| 14   | NETTING PRESSURE TZ09                      |
| 16   | NETTING PRESSURE TZ10                      |
| 17   | NETTING PRESSURE BAR GRAPH TZ09            |
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| 20   | CONCLUSIONS: BREEDING                      |
|      | FEEDING ROOSTS                             |
|      | EFFECT OF DEVELOPMENT ON BAT FAUNA         |
|      | SUBORDER BREAKDOWN, TZ09/TZ10 BREAKDOWN    |