

**AN EXECUTIVE SUMMARY REPORT**

**ON**

**BIODIVERSITY SURVEY AND SUGGESTIONS ON SUSTAINABLE  
MANAGEMENT STRATEGIES OF INDIGENOUS FOREST REMNANTS IN  
ALBIZZIA DOWNS ESTATE, THIKA**

By

NATIONAL MUSEUMS OF KENYA (NMK) RESEARCH TEAM

Dr. Itambo Malombe, Dr. Joseph G.Mutangah, Kennedy W. Matheka and M. Kioko

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## **1. Introduction**

The Indigenous forest remnants at Albizzia Downs Estate are living evidence or indicators of the once large vast spread lowland dry indigenous forest block that used to occur the lower slopes of Eastern Aberdares Ranges stretching from Nairobi to Nyeri. These forest remnants are very important for biodiversity conservation in the region as they act as living in-situ indigenous germplasm ‘botanical gardens’. They are also important as epitomes of ecosystem services including carbon sinks, pollination services for improved food production as well as ecotourism attraction.

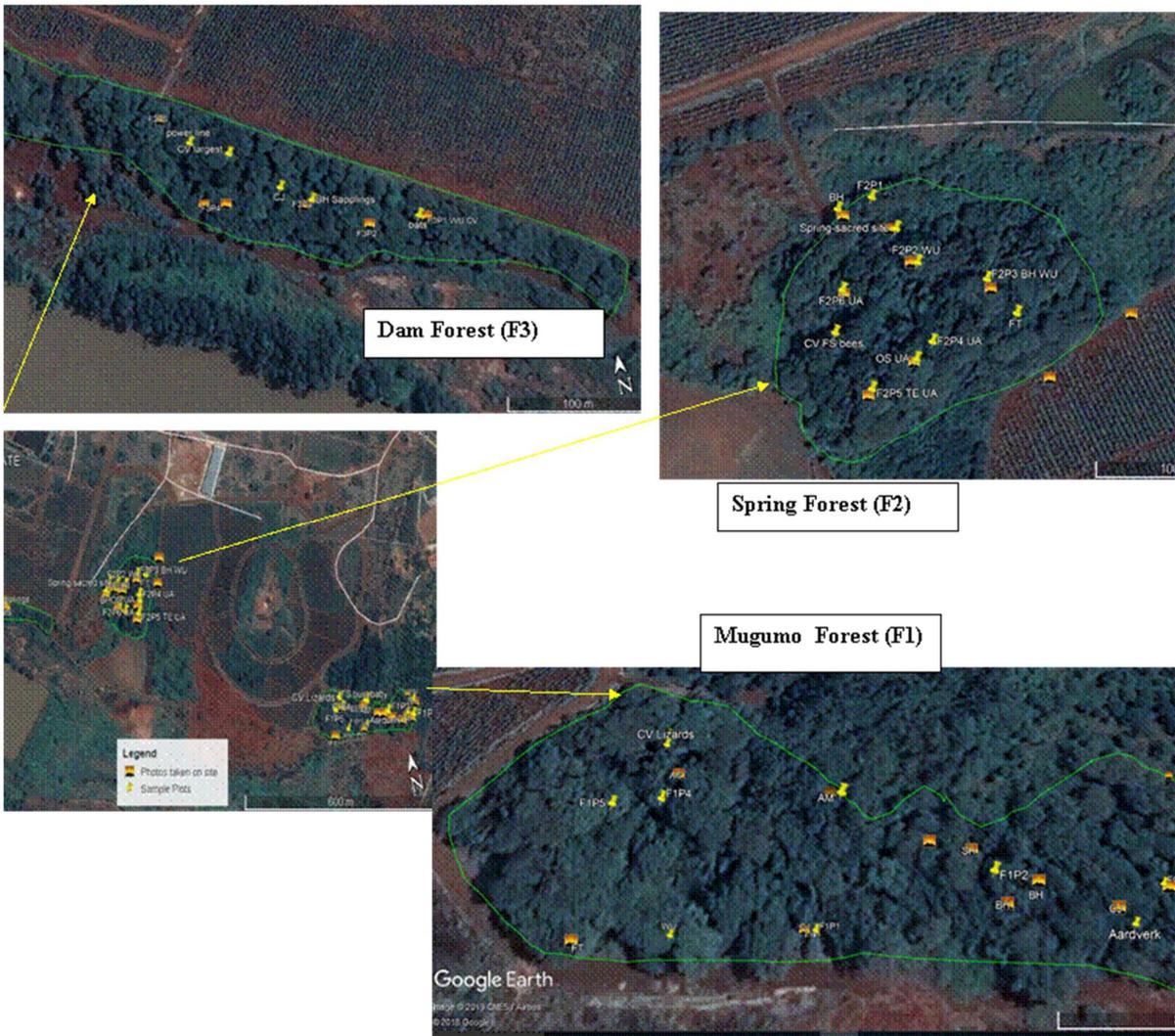
While many two attempts have been now done to document biodiversity resources of these forest relics, the work is far from being complete as they are quite rich in species diversity of both flora and fauna. With the upcoming estate development these forest need detailed biodiversity inventory so as to establish baseline species information for monitoring purposes on the health of the forests after human settlements have been established.

The overall Objective of the current study was first, to validate and upgrade our biodiversity records of the forests including narrative of the site physical characteristics associated with biodiversity conservation and second to assist the facility management to come up with attainable and sustainable management options to ensure protection and wise management of the forest remnants for future generations generations.

## **2. Field Observations**

The survey involved walking through the forest remnants which for study convenience were named Forest 1 to the extreme east of the Estate, Forest 2 in the middle of the Estate and Forest 3 to the extreme west of the Estate as shown in the diagrams below,

the yellow spots denoting where the NMK Study Team established biodiversity sampling plots.



A detailed report on species diversity, vegetation composition and physiognomic structure of the sampled forest fragments is attached to this executive summary as a separate document to avoid information obscurity.

**2.1 Plant Diversity:** As was mentioned in the earlier biodiversity study undertaken more than 15 years ago, the Albizzia Down forests (formerly David Harris) endowed with high number of unique flora and avifauna (birds) species. Compared with what was recorded earlier, the current study recorded 40 per cent more species to bring to a total of 144 vascular plant species recorded so far. These recorded floral plant species belong to 119 genera and 52 families, (Figure 2) out of which, 42 were woody species and mostly trees. The most frequent shrubby species included *Clausena anisata*, *Maytenus heterophylla*, *Psiadia punctulata*, *Vepris simplicifolia*, *Jasminum fluminense*, *Grewia similis*, *Searsia natalensis*, *Acokanthera schimperi*, *Elaeodendron buchananii* and *Croton*

*megalocarpus*. The most common tree species included *Brachylaena huilenis*, *Croton . megalocarpus*, *Vepris. simplicifolia* and *V. trichocarpa*, *Ficus species*, *Warbughia ugandensis*,

Like many forest remnants/relics the edge forest effect is dominance of invasive plant species and in our case the common ones are *Lantana camara*, *Pterelobium stellatum* and *Tithonia diversifolia* and pioneer trees like *C. megalocarpus* *Croton macrostachyus* and *bridelia macrantha* which dominated the forest edges and forest gaps

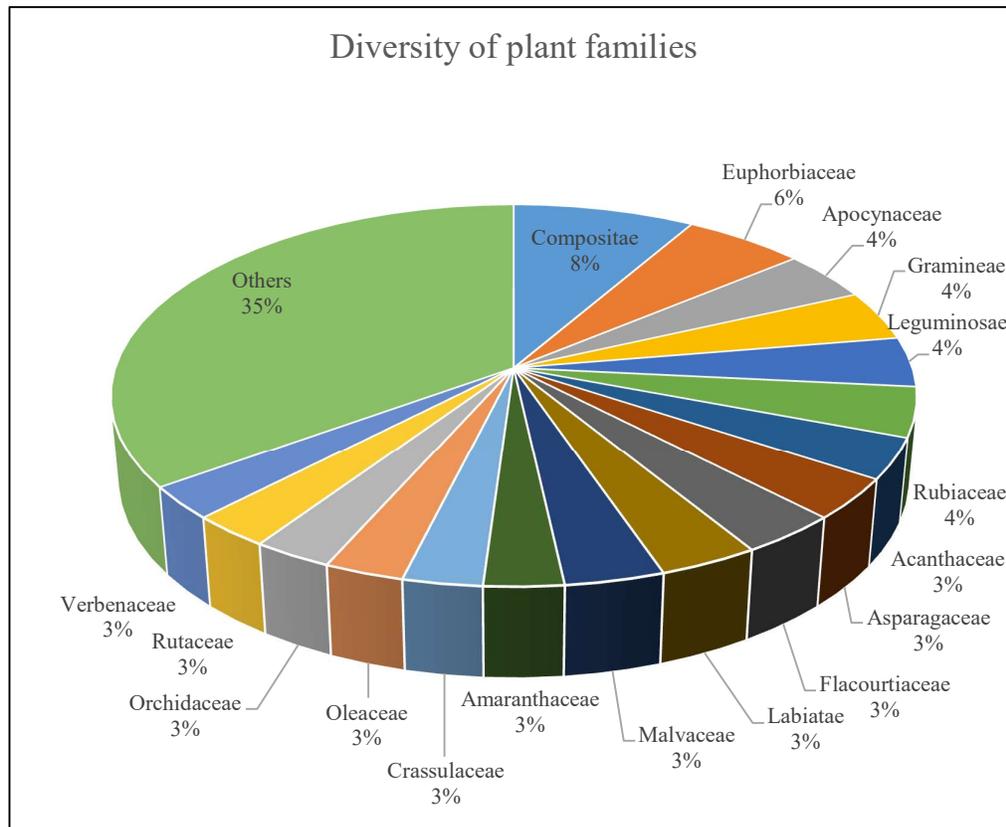
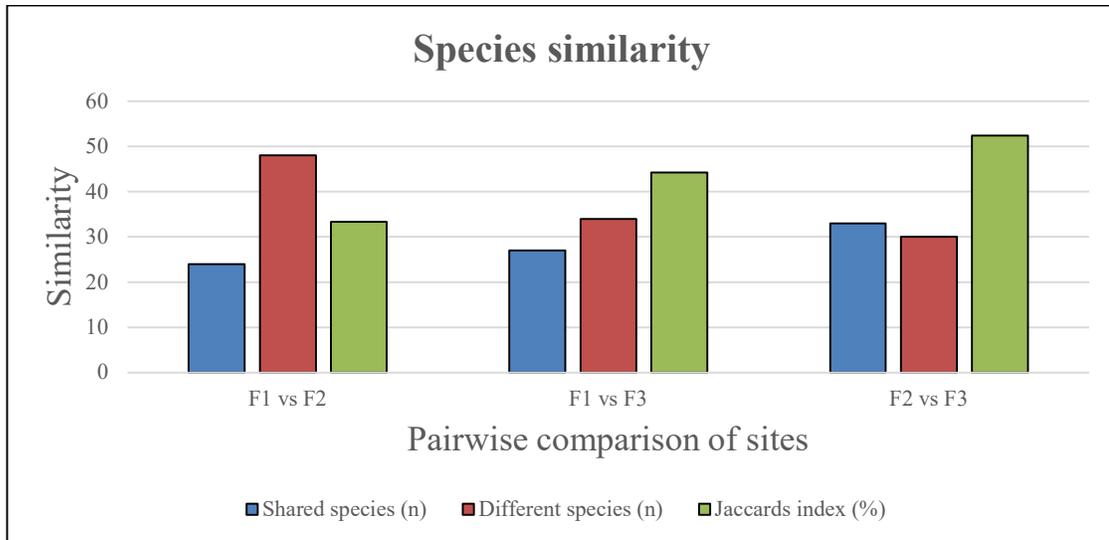


Figure 2 Species diversity within flora families

## 2.2 Species Similarity Among the 3 Forest Remnants

Plant species similarity (Figure 3) of sample plots was also observed by use of Jaccards index, which pairs up plots for analysis of shared species and those unique to either samples. The pair of F2 & F3 is the most similar (52%) and also with the highest number of shared species (33). F1 vs F2 was the most dissimilar (33% on Jaccards index) and lowest number of shared species (24).



**Figure 3: similarities among the indigenous forests blocks**

### 2.3 Threatened and Endemic Plant Species

Three (3) species were threatened and at different levels of threat. They included *Brachylaena huillensis* (Near Threatened), *Croton alienus* and *Afrocanthium keniense* (*Canthium keniense*) (Vulnerable). *B. huillensis* has been decimated in the upland dry forests over the years for wood carving industry, which is exacerbated by its proximity from Nairobi. The other two species are narrow endemics with *A. keniense* known only from these type of forests (Beentje, 1990). Other species of conservation concern in albizzia Downs Estate forests include *Chrysophyllum viridifolium*, *Trichillia emetica* and *Warburgia ugandensis*. Although the first two species are common in nature, the sheer huge size of the few individuals found in the forests is a ‘marvel’ and hardly found anywhere else in the country. It is notable that, *C. viridifolium* is only known from these vegetation type in Kenya and is rarely recorded over the years, meaning the tree may only be remaining in these few fragments. Also, *W. ugandensis* is threatened in many ecosystems due to medicinal use and habitat loss in suitable altitude of arable afro-montane origin.

All threatened or rare species, except *C. jiguu*, were found in Spring forests (F2). More botanical search may however find this species in F2. Mugumo forest (F2) and Dam forests (F3) recorded 12 and 10 species, respectively. From our study the following species were recorded for the first time in the area which are to be added to the 59 endemic species already known, i.e. *Euphorbia inaequilatera*, *Aerangis confusa*, *Cassipourea rotundifolia*, *Oldenlandia johnstonii*, *Tarenna graveolens* and *Hybanthus enneaspermus*. Of interest to the species list of endemic species are those that were recorded once in our study sites that can be considered both endemic and rare. These include *Aerangis confusa*, *Ficus scassellatii*, *Euphorbia inaequilatera* and *Synadenium compactum*.

In addition, it is a refugia of one of the Kenya's rarest, endemic and threatened bird, blue crested turaco (Malombe & Mutangah, 2005). It is notable that besides having FF species, David Harries was the only site where Purple-crested Turaco *Tauraco porphyreolophus chlorochlamys* were encountered. In Kenya, this species is scarce and localized in a few areas. Their populations are rapidly declining due to continued habitat destruction and it is endangered in our region (Zimmermann *et. al.* 1996). It may have, already undergone local extinction in some of its former range in Kenya and it is one of the species that the Bird Committee of The East African Natural History Society would like to receive records of their sightings (EANHS 1996). The ecology (mainly feeding and breeding biology) of this species under the contemporary habitat decline is not understood and needs to be studied as the pressure mounts to enable remedial measures to be taken in time.

(At the time of writing this report, analysis of avifauna (birds) diversity had not been finalized and will appear in the final report of the survey).

#### **2.4 Conservation Status:**

Apparently the forest looks more intact with minimal human disturbance compared to 15 years ago when the first biodiversity survey was carried out. This is a credit to the current and former Estate Management who have put stringent conservation measures to protect the forest. However, there were just a few disturbances including frequent walk paths inside the forest, old debarking marks on trees of *Warburia ugandensis* (Muthiga local name), a few cuts of liane stems and occasional old torn plastic bags scattered as litter.

With the proposed upcoming urban settlement, the ecology of these forest might change unless close monitoring of disturbance is firmly instituted in the management strategies. Obvious indications of disturbance coming with the new urban settlement within and bordering the Albzzia Downs forests might include the edge impacts forest encroachment.

### **3. Sustainable Management Recommendations**

3.1 Fencing the Indigenous Forest Remnants to protect them from encroachment of the upcoming urban settlements

3.2 Income Generation Suggestions include:

3.2.1 Development of Recreation and Tourism facilities (camping sites, picnic sites and nature trails). These facilities could be used for events like weddings, music shootings recreational habitation and nature walks (ecotourism)

3.2.2 Establishment of Education and Training Resource Center

3.2.3 Establishment of a Hotel with in-door games, sports, cultural dances, Sale of items: such as forest map sales, guide books, cafe, donations, parking fees, events, corporate team building,

3.2.4 Establishment of a Plant Nursery and making sales at the nursery plants, compost etc.)

3.3 Write Management Plan and Fundraising Project Proposals

3.4 Formation of Forest Conservation and Management Trust

3.5 Leasing the Running (management) of the Income Generation Businesses to a Private Entrepreneur who would be paying the lease levy to the Forest Conservation and Management Trust

#### **4. Conclusion**

In conclusion, these are an outline of ideas. A professional management plan will have to be designed in support and protection of the endangered species and the areas with a high biodiversity concentration. No thinning, clearing or planting can precede this. In addition, other stakeholders and experts need to be involved in shaping the decisions for long-term conservation and utility of indigenous forests at Abizzia Downs. For example, discussions with environment and planning administration in Kiambu County will help to market and entrench the right decision making. The area along Komu River constitutes a key wetland area with its unique flora, fauna and problems such as potential pollution from the estate need to be addressed at the beginning of the infrastructure development. Perhaps a special management plan and implementation need also to be established.

#### **5. Big Question to the Management of Albizzia Downs Estate**

**As an Environmental Impact Assessment (EIA) been done to advise the proposed urban development options?. If not, then this is an important element to consider before developments start.**