DIVERSITY AND CONSERVATION OF FORESTS IN UGANDA

JAMES KALEMA AND ALAN HAMILTON
Field Guide to
The Forest Trees
of Uganda
For Identification and Conservation
James Kalema and Alan Hamilton

NEW FIELD GUIDE TO THE FOREST TREES OF UGANDA (2020)

PUBLISHERS: (1) CABI (for international distribution); (2) Alan Hamilton (for Uganda).

PURPOSE: Tool for practical use in the field by foresters, communities, NGOs and ecologists – for conservation and sustainable development.

COVERAGE: Includes all 451 species of trees known from the tropical forests (‘tropical high forests’) of Uganda (NB: about an equal number occur in savanna and other vegetation types)

AVAILABILITY: Distribution by GUSTRO (Sir. Apollo Kaggwa Road)
GLOBAL CONTEXT

Whole global ecosystem disrupted by human activities.

Temperature $1.1^\circ C$ above preindustrial levels (1800); climate will become chaotic once reaches $1.5^\circ C$.

20% of world’s plant species threatened with extinction.

50% of world plant species are in tropical forests

Tropical rainforest major carbon store. Loss contributes significantly to rises in greenhouse gases.
MT ELGON: FOREST LOSS DURING 3 DIFFERENT PERIODS

Forest loss during each period

Sassen (2014)


RIGHT: Matiri Central Forest Reserve. Photo: James Kalema (2008)
Brief history of forestry

• Forest Department formed (1927), initial emphasis on environment protection.

• Maximum extent of forest reserves (1966) – central and local.

• Several reorganisations (1966-2004), culminating in closure of Forest Department and creation of National Forestry Authority.

• Increasing emphasis on plantations (eucalyptus, pines) and less on natural forests.

• Outsourcing of many forest activities.
## BENEFITS OF NATURAL FOREST V. EXOTIC PLANTATIONS

<table>
<thead>
<tr>
<th>NATURAL FORESTS</th>
<th>EXOTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRODUCTS:</strong></td>
<td>Medium-grade wood, poles, wood fuel</td>
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<tr>
<td>Many types (timbers, medicines, etc.)</td>
<td></td>
</tr>
<tr>
<td><strong>ECOSYSTEM REGULATION</strong></td>
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<tr>
<td>Much better: climate, water supplies, flood control,</td>
<td></td>
</tr>
<tr>
<td>etc.</td>
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<tr>
<td><strong>CONNECTIONS WITH CULTURE</strong></td>
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<tr>
<td>Continuing presence will help keep cultural connections and interest alive</td>
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### CAUTIONS

1. Single interest pressure groups can distort forestry policies (also happened in the UK).

2. Natural forest should never be cleared to plant pines or eucalyptus.

3. Monocultures susceptible to invasive species, pests, diseases (coronavirus, banana diseases).
MAJOR NEW PAPER ON TROPICAL FORESTS AND CLIMATE CHANGE RELEASED TODAY

Includes data from Mpanga Forest for 2 decades from 1968.

Data from 1990s and later could not be used (too much human disturbance, esp. tree cutting for drum-making).

Illustrates how providing ‘alternatives’ will not work for many specific products.

Also will not work for products where beneficiaries of tree plants (landowners) are not the same as those who benefit from forest exploitation (charcoal burners).

*Funtumia* tree cut for drum-making in Mpanga Forest (2016)
THOSE WISHING TO CONSERVE TROPICAL FORESTS NEED SOCIAL ALLIES
TWO SUGGESTED SETS

(1) Community members interested in continuing access to certain forest products. For example medicinal plants.

(2) Social elements (communities, government, NGOs) concerned with the continuing availability of water supplies.

Suggested roles for naturalists and environmentalists. Help document fast disappearing local knowledge of nature and natural environment. Find ways of retaining and reinforcing it (mainly relies on using it).
RESOURCE PROVIDED IN THE NEW FIELD GUIDE: 1104 LOCAL TREE NAMES IN 21 OF UGANDAN’S 42 INDIGENOUS LANGUAGES

<table>
<thead>
<tr>
<th>Abr</th>
<th>Language</th>
<th>No.</th>
<th>Speakers</th>
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<td>Luo</td>
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<td>45</td>
<td>893,000</td>
<td>to</td>
<td>Rutooro</td>
<td>105</td>
<td>846,000</td>
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</table>

HELP WITH AUTHENTICATING NAMES IN SOME LANGUAGES: Nelson Omagor, Olivia Wanyana Maganyi, Christine Kabuye, Perpetra Akite, Ben Kirunda, Samuel Nsutiayyesu, Robert Barigyria, Dennis Babaasa, Patrick Mucunguzi)
Nilo-Saharan Language Family

Central Sudanic: **Lugbara, Madi**

Eastern Sudanic

Western Nilotic (all in Luo sub-group, for which a single index is provided)

  Acholi, Lango
  Alur

Eastern Nilotic: **Karimojong, Teso**

Southern Nilotic: **Kupsapiny**

Niger-Congo Language Family (all in Bantu sub-group)

Kongo: **Lukonzo**

Lega-Kalanga: **Kwamba**

Masaba-Luhya: **Lunyole, Lusaamia-Gwe, Lumasaba**

Nyoro-Ganda

  Luganda, Lusoga
  Lugwere
  Runyakitara sub-group: **Rukiga, Runyankore, Runyoro, Rutooro**

Ruanda-Rundi: **Rufumbira**
Figure 4. Energy and water budgets of forest and overgrazed grassland.
What we mean by forest

- Forest = typically with continuous stand of trees, tall canopy (10 to 50 m or more), multi-layered, crowns often overlapping

- Tree = perennial, woody, typically with a single main stem, distinct crown, to a height of $\geqslant 5$ m

- FTEA

- Kalema and Beentje (2012)
Degradation
Propagation

- Nurseries of the National Tree Seed Centre are found

- Namanve, Banda, Nagojje

Indigenous tree nursery (Prometra)
Propagation

Info sources:
• Rudi Lemmens (web addresses in our book)
• World Agro-forestry Centre (ICRAF)
Arrangement of species

• Primarily vegetative

• Secondarily by taxonomic relationships

• Why?
• Angiosperm Phylogeny Group (version IV, 2016) and DNA analysis

• Classification changes e.g. Bombaceae, Sterculiaceae, Tiliaceae now all in Malvaceae
Characters for tree identification and taxonomic keys

- Leaves
- Latex
- Bark

Plates of species (321 out of 451 illustrated)
Name changes (Synonymy)

CELASTRACEAE, 160-163, 329-330
*Celtis adolfi-fridericii* Engl., 91
*C. africana* Burm. f., 89; Plate 8
*C. durandii* Engl., 90
*C. gomphophylla* Baker, 88; Plate 8
*C. mildbraedii* Engl., 86; Plate 8

BOMBACACEAE, 115
*Bombax buonopozense* P. Beauv., 363; Plate 28

BORAGINACEAE, 112-114

CHRYSOBALANACEAE, 200
*Chrysophyllum albidum* G. Don, 40
*C. beguei* Aubrév. & Pellegr., 44
*C. delevoyi* De Wild., 42
*C. fulvum* S. Moore, 42
*C. gorungosanum* Engl., 42
*C. muerense* Engl., 39
*C. pentagonocarpum* Engl. & K. Krause, 45
*C. perpulchrum* Hutch. & Dalziel, 41
*C. pruniforme* Engl., 46
*C. ubangiense* (De Wild.) D. J. Harris, 45
Other contents

Keys for identification

Key to Croton
1. Leaves with scales beneath... **109. C. megalocarpus**
   Leaves without scales beneath..2
2.

Descriptions of the species
25 m (usually smaller at lower altitudes).
Trunk straight and cylindrical (occasionally weak and leaning), with branches at right angles....

Occurrence (distribution and ecology)
OCURRENCE: U2-4

Conservation status
Conservation status (IUCN Redlisting and CITES Appendices)

Guidelines for Using the IUCN Red List Categories and Criteria Version 14 (August 2019)
Species

Year

Total species assessed
Total threatened species
Kalema and Beentje (2012): cover all 451 forest tree spp/829 tree spp; global assessment

IUCN (2020): covers 172 tree spp; global assessment

WCS (2016): cover 42 forest tree spp; national assessment

54 spp of forest trees threatened (all 3 evaluations)

CITES-listed

Many species in danger of extinction in Uganda (high rate of forest loss, over-harvesting, climate change)

60% of wild coffee species are threatened (deforestation, climate change – Davis et al 2019) - accessing coffee genetic material for breeding is becoming increasingly difficult..

Coffea arabica - globally provides an export value of over US$13 billion per year

Coffea arabica populations could reduce by 50% by 2088 (Moat et al 2017)

43 Mada, 12 Tz, 2 eth, 2 DRC, 2 S Sud