The Right Tree for the Right Place: the www.vegetationmap4africa.org and smart phone applications to support forest landscape restoration in Eastern Africa

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Agroforestry is a dynamic, ecologically-based, natural resource management practice that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits.
The Right Trees for the Right Place

A. Trees for Products

fruit  firewood  medicine  income  Sawn wood  fodder

B. Trees for Services

Soil fertility  Carbon  erosion  watershed  shade  biodiversity

C. Trees for right place...  Simple as ABC !?
Locations of 985 useful tree species

www.gbif.org

<table>
<thead>
<tr>
<th>Occurrences</th>
<th>Species</th>
<th>Percentage</th>
<th>Cum. Percentage</th>
</tr>
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<td>1</td>
<td>0.1%</td>
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<tr>
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<tr>
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<td>63</td>
<td>6.4%</td>
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<td>38.2%</td>
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</tr>
<tr>
<td>All</td>
<td>985</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Biased locations ... and some locations are wrong
A vegetation map for eastern Africa

The map of potential natural vegetation of eastern Africa, gives the distribution of potential natural vegetation in Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Burundi, Malawi and Zambia. The map distinguishes 48 vegetation types, divided in four main vegetation groups: 16 forest types, 15 woodland and wooded grassland types, 5 bushland and thicket types and 12 other types. Furthermore, a number of compound vegetation types are mapped, which include vegetation mosaics, catena's and transitional zones. The current version is 2.0. The map is available in various formats, listed below. Before using the maps, please consult the terms of use.

Web-based maps

View the interactive online map in your browser and quickly find out more about the natural vegetation and its species for any location. Click here

Maps in mobile format

Bring the map with you in the field and know the natural vegetation where ever you are. Download the map for use on your favorite mobile map viewer - Click here.
vegetationmap4africa
http://www.vegetationmap4africa.org/Vegetation_map.html

Web-based maps
Useful Tree Species for Eastern Africa
a species selection tool based on the VECEA Map

Afromontane rain forest (Fa)

Description

Afromontane rain forest is very similar in structure (physiognomy) to certain types of Guineo-Congolian rain forest. Species composition, however, is almost entirely different. Floristic differentiation between Afromontane rain forest and Guineo-Congolian rain forest includes the occurrence of tree ferns (Cyathea) and the occurrence of conifers (especially Podocarpus latifolius; White 1983 p. 164 - 165).

These forests occur mainly between 1200 and 2500 m on the slopes of certain mountains. However, the altitudinal limits vary greatly according to distance from the equator, proximity to the ocean, and size and configuration of the massif on which these forests occur (White 1983 p. 164). The mean annual rainfall lies mostly between 1250 and 2500 mm. Mists that frequently occur during the dry season of one to five months may explain the fact that Afromontane rain forest is much less deciduous than lowland semi-evergreen forests that receive similar rainfall. Only a few of the larger tree species (Entandrophragma excelsum and Pouzera adolf-friederich) lose their leaves - and then only for a few days (White 1983 p. 164).
Plant species

The main species recorded to occur within this vegetation type are listed below. Clicking the name of any of these species will open the page for that species on the Agroforestry Species Switchboard. Between brackets the English vernacular name of the species and the documented country distribution of the species (B=Burundi, E=Ethiopia, K=Kenya, M=Malawi, R=Rwanda, T=Tanzania, U=Uganda, Z=Zambia) is provided.

Based on information on species presence in national manifestations of vegetation types, each species was classified as a regionally dominant, characteristic, present or marginal species for a vegetation type (Read more ...)

- Dominant - if the regional documentation classified the species as dominant.
- Characteristic - if the species was documented to be characteristic for at least half of all the national manifestations of the vegetation type and if the species was characteristic in at least two national manifestations of the vegetation type. Species were always classified as characteristic if the species was a regional indicator or regional characteristic species for the vegetation type.
- Present - if the species was documented to be characteristic in at least one of the national manifestations of the vegetation type or if the species was documented to be present in at least half of all the national manifestations of the vegetation type. Species that were already listed as characteristic were excluded.
- Marginal distribution - if some of the national documentation listed the species, but where the species was not included as characteristic or present.

Characteristic species

Chrysothamnus ramosissimus (BKMRU2), Cola greenwayi (Hairy cola, KMTZ), Cyathea dregel (South African tree fern, EKMRU2), Cyathea humilis (KT), Cyathea maritima (BEKMRU1), Cylicomorpha parviflora (KMT), Diepyropterus abyssinica (Giant diepyropterus, EKMRU2), Entandrophragma excelsum (BKRMTU2), Ficalhoa laurifolia (BMRTU2), Ferriya rubrostipulata (BEKMRU2), Macaranga capensis (River macaranga, BEKMRU2), Myrianthus holstii (Giant yellow mulberry, BKMRU2), Ocotea usambarensis (East African camphor wood, KMRU2), Olea capensis (Elong teak, EKMRU2), Parinari excelsa (Rough-skinned plum, BMRTU2), Podocarpus latifolius (East African yellowwood, BKMRU2), Pouteria adolf-friederici (Aningar, BKMRU1), Prunus africana (Red stinkwood, BEKMRU2), Strombosia scheffleri (BKMRU2), Syzygium guineense (Guinea waterberry, BEKMRU1), Tabernaemontana stapfiana (Soccerball fruit, BKMRU1), Xylosma monospora (Lemonwood, BKMRU2)

Species present
- Marginal species (occurrence less certain)

Products and environmental services of tree species

Documented products and environmental services for the tree species occurring in this vegetation type (See)
www.vegetationmap4africa.org

selection of tree species

Products and environmental services of tree species

Documented products and environmental services for the tree species occurring in this vegetation type (Fa) are listed below. Clicking the name of any of these species will open the page for that species on the Agroforestry Species Switchboard. Between brackets information is given on the status of each species (‘dom’ indicates dominant species, ‘cha’ characteristic species, ‘pre’ other species of marginal occurrence), the English vernacular name of the species and the documented country distribution of the species (B=Burundi, E=Ethiopia, K=Kenya, M=Malawi, R=Rwanda, T=Tanzania, U=Uganda, Z=Zambia).

Wood
- Firewood
- Charcoal
- Timber, Furniture, Construction

Chrysophyllum gorgosanum (Chu, BKMTUZ), Cyathaea marniana (Chu, BEKMTUZ), Diospyros abyssinica (Chu, Giant dospysros, EKMTUZ), Entandrophragma excelsum (Chu, BMRTUZ), Ficalhoa laurifolia (Chu, BMRTUZ), Flourensia rubrostriata (Chu, BEKMTUZ), Macaranga capensis (Chu, River macaranga, BEKMTUZ), Orotea usambarensis (Chu, East African camphor wood, KAMRTUZ), Olea capensis (Chu, Elgon teak, EKMTUZ), Parinari excelsa (Chu, Rough-skinned plum, BMRTUZ), Podocarpus latifolius (Chu, East African yellow-wood, BKMTUZ), Pouteria adolfi-friederici (Chu, Aningeria, BEKMTUZ), Prunus africana (Chu, Red stinkwood, BEKMTUZ), Strombosia schefleri (Chu, BKMTUZ), Syzygium guineense (Chu, Guinea waterberry, BEKMTUZ), Xylocos monospora (Chu, Lemonwood, BKMTUZ), Acacia lahai (Pre, Red thorn, EKTUZ), Afrocopusp calcatius (Pre, Yellowwood, EKMTUZ), Albizia grandibracteata (Pre, Large-leaved albusia, BEKRTUZ), Albizia gummifera (Pre, Peacock flower, BEKMTUZ), Albizia schiperinana (Pre, Long-podded albusia, EKMTUZ), Allophylus abyssinicus (Pre, EKMTUZ), Apodytes dimidiata (Pre, Pear wood, BEKMTUZ), Baliosaria schliebenii (Pre, BRT), Bersama abyssinica (Pre, Winged bersama, BEKMTUZ), Bridelia bidentii (Pre, BMRTUZ), Carapa procera (Pre, Uganda crab wood, BRTUZ), Casuarina battuscombei (Pre, Forest sword leaf, KMTUZ), Cassipourea maluona (Pre, Bastard onionwood, BEKMTUZ), Cassipourea rumicosa (Pre, Pre, Khalt, EKMTUZ), Celtis africana (Pre, White stinkwood, BEKMTUZ), Cornus volkensii (Pre, Acrocnia, BKMTUZ), Croton macrostachys (Pre, Broad-leaved croton, BEKMTUZ), Croton sylvaticus (Pre, Forest fever berry, EKMTUZ), Dombeya torrida (Pre, Forest dombeya, BEKMTUZ), Dracaena steudneri (Pre, Steudner's dragon tree, BEKMTUZ), Ehretia cymosa (Pre, EKMTUZ), Ekebergia capensis (Pre, Cape ash, BEKMTUZ), Euphorbia abyssinica (Pre, Desert candle, EKMTUZ), Ficus sur (Pre, Cape fig, BEKMTUZ), Galpinia saxitriga (Pre, BEKMTUZ), Hagenia abyssinica (Pre, Hagenia, BEKMTUZ), Harungana madagascariensis (Pre, Orange milk tree, BKMTUZ), Illx iteris (Pre, African holly, BEKMTUZ), Kigelia moosa (Pre, KRMTUZ), Ocotea kenyensis (Pre, Bastard stinkwood, EKMTUZ), Olea europaea (Pre, African wild olive, BEKMTUZ), Pittosporum crassifolium (Pre, Cape Cheesewood, EKMTUZ), Polyscias fulva (Pre, Parasol tree, BEKMTUZ), Pouzetera aitissima (Pre, Anineeria, EKRTUZ), Pseudoxarvillara (Pre. Lady of the night, EKMTUZ), Raanana melanoscleros (Pre, Cape...
Each species is linked to web-based databases such as the ICRAF agroforeestree Database, the Plant Resources of Tropical Africa (PROTA), the CABI Invasive Species Compendium, Tropical Forages or FAO’s ECOCROP database.

26,135 plant species
33,813 including synonyms
242,505 hyperlinks (excluding ‘search’)

www.vegetationmap4africa.org
selection of tree species
www.vegetationmap4africa.org
Google Earth version
www.vegetationmap4africa.org
smart phone version (via Locus app)

Useful woody species

The main species recorded to occur within this vegetation type are listed below. Clicking the name of any of these species will open the page for that species on the Agroforestry Species Switchboard.

- Characteristic species: Albizia grandibracteata, Alstonia boonei, Antiaris toxicaria, Celtis adolfi-friderici, Celtis africana, Celtis gomphophylla, Celtis mildbraedii, Celtis philippensis, Celtis zenkeri, Chrysophyllum albidum, Cynometra alexandri, Entandrophragma angolense, Entandrophragma cylindricum, Entandrophragma utile, Holoptelea grandis, Khaya anthotheca, Khaya...
Africa Tree Finder


- App developed with IUCN in Know-for-FLR project (DFID)
- Stand-alone app for basic Android smart phone
Africa Tree Finder

• App developed with IUCN in KNOWFOR project (DFID)
• Same functions of selecting useful tree species
• Will include option to capture and upload species and vegetation images (citizen science, confirm/contest species presence, restoration monitoring)
All agreed that the app is useful and user-friendly.
Some other application domains

Species distribution mapping and seed source selection

Conservation planning

Climate change modelling

Biodiversity monitoring

Map of Potential Natural Vegetation

Modelled map based on long-term average conditions ("climate")

Environmental Gap Analysis to Prioritize Conservation Efforts in Eastern Africa

Tree diversity analysis

BiodiversityR
Open-source R package
YouTube video on IUCN-Farm Radio International-ICRAF collaboration in Uganda

https://www.youtube.com/watch?v=ZsmunU87Dgg&feature=youtu.be

Premiered in Paris on 5 Dec 2015 as a winner of the Global Landscapes Forum 2015 Partner Video Award
Tree Seeds for Farmers - toolkit

http://www.worldagroforestry.org/our_products/databases
Tree Seeds for Farmers

The toolkit contains three sections:

PART I: Strategies for scaling up seed production

• Chapter 1: Seed Production and Distribution Strategies
• Chapter 2: Research
• Chapter 3: Extension
• Chapter 4: Training
• Chapter 5: Information Sources
• Chapter 6: Species Selection

PART II: Technical guidelines in seed production

• Chapter 7: Seed Sourcing
• Chapter 8: Seed Collection
• Chapter 9: Seed Processing (see also videoclips listed below)
• Chapter 10: Seed Storage
• Chapter 11: Seed Dormancy and Pre-sowing Treatments (see also videoclips listed below)
• Chapter 12: Seed Quality – Physiological and Genetic
• Chapter 13: Seed Distribution
• Chapter 14: Seed Documentation

PART III: The private sector and seed production

• Chapter 15: The Business Approach
• Chapter 16: Marketing Seed and Seedlings
• Chapter 17: Tree Nurseries as an Enterprise
• Chapter 18: Tree Seedling Quality
• Chapter 19: Tree Nursery Operators as Extension Agents

Download the Tree Seeds for Farmers toolkit. English Version | Spanish Version
Tree Seeds for Farmers

Suggestions for further reading:

- Schmidt, Lars. 2000. Guide to handling of tropical and subtropical forest seed. DANIDA Forest Seed Centre, Humlebaek, Denmark. Xxi+511 pp Download from Forest and Landscape Denmark
- Mulawarman, Roshetko JM, Sasongko SM and Irianto D. 2003. Tree seed management. Seed sources, seed collection and seed handling. A field manual for field workers and farmers. TFRI Extension Series No. 152. World Agroforestry Centre (ICRAF), Winrock International in collaboration with Indonesia Forest Seed Project, Bogor, Indonesia. 54 pp Download pdf
- Florabank guidelines for best practice for seed collection and use Download from Flora Bank
- Tropical trees: propagation and planting manuals produced by Longman
  - VOLUME 1: Rooting cuttings of tropical trees Download from FAO
  - VOLUME 2: raising seedlings of tropical trees Download from FAO
  - VOLUME 3: growing good tropical trees for planting Download from FAO
  - VOLUME 4: preparing to plant tropical trees Download from FAO
- Seed leaflets developed by the former Danida Forest Seed Centre Download from Forest and Landscape Denmark
- Nursery manuals developed by the World Agroforestry Centre Download
- Business skills for small-scale seed producers produced by Soniia David and Beth Oliver Download from CIAT-Africa

For download:
http://www.iufro.org/download/file/22340/1303/ws34_pdf/
The Right Tree for the Right Place: the www.vegetationmap4africa.org and smart phone applications to support forest landscape restoration in Eastern Africa

Thank you very much for your attention

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